NSW Waste Avoidance and Resource Recovery Strategy 2007

Department of **Environment & Climate Change** NSW

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Department of Environment and Climate Change NSW

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Foreword

We are living in a time where we understand more about our planet and our ecosystems and the impacts of human activity. Without careful management, these impacts could have long lasting effects on our environment and our way of life.

We have the responsibility for ensuring that as both a government and a community, we do everything that we can to reduce the burden on our environment and our precious resources. This will ensure that they do not suffer irreversible harm and that they are still there for future generations to use and enjoy.

Immediate issues such as water shortages and climate change require decisive and coordinated responses. But we also need to make sure that as our focus is drawn to these major problems we keep an eye to the ongoing challenges we have sought to tackle in the past.

Avoiding waste, re-using and recycling have been part of our lives for many generations. These actions are something our parents and grandparents were already doing and they are still strongly supported today. But what many of us don't realise is that waste reduction and recycling can also make a big contribution to reducing greenhouse gas, saving water and saving energy. For example, the more than 6 million tonnes that NSW is currently recycling is already avoiding over 3.3 million tonnes of CO_2 equivalent.

The 2007 Waste Avoidance and Resource Recovery Strategy reflects national and international best practice and the experience gained from our own work in NSW over the past decade. It identifies priority actions that will guide the work of all key groups in NSW in contributing to the minimisation of environmental harm from waste disposal and the conservation and efficient use of our resources.

The 2007 Strategy is an important next step in our progress toward meeting our goals of driving down waste and increasing our recycling rates. I encourage you to work with the Department of Environment and Climate Change towards this important goal.

Phil Koperberg
Minister for Climate Change, Environment and Water
September 2007

1 Introduction

The *Waste Avoidance and Resource Recovery Strategy 2007* (*Waste Strategy 2007*) updates the *Waste Avoidance and Resource Recovery Strategy 2003* (*Waste Strategy 2003*).

The underlying policy drivers behind *Waste Strategy 2003* were the need to maximise conservation of our natural resources and to minimise environmental harm from waste management and disposal of solid waste. These drivers are even more important in 2007 against a backdrop of a growing population in NSW and a healthy economy that is producing more goods and services.

Waste Strategy 2007 continues to provide guidance and priorities for action to ensure that efficient resource use and impacts on the environment are considered throughout the life cycle of goods and materials. This includes extraction of raw materials, manufacturing, distribution, consumption and recovery for reprocessing or safe disposal. These drivers are strongly supported by a community that is becoming more knowledgeable and more attuned to the threats and limitations to our basic resources such as water, energy, raw materials, habitats and atmospheric gases that previous generations have taken for granted.

While policies and programs relating to waste avoidance and resource recovery are only part of the toolbox that governments can use to protect the environment and conserve resources for future generations, a waste and resource recovery perspective is something that everyone can relate to. This means that consistent and equitable approaches can be developed to encourage and influence behaviour. The focus at the waste reduction and resource recovery end is also a practical and accessible way of tackling resource use that preserves the economic health of NSW and does not threaten the life aspirations of individuals or of different generations.

Since *Waste Strategy 2003* was released, there has been mounting scientific research that has quantified the benefits and impacts of waste related actions to other parts of the environment e.g. water savings, conservation of virgin resources, greenhouse gas and soil health. There has also been a growing understanding that actions taken to tackle any environmental or resource use issue are strongly interconnected in people's minds. This means that continuing to encourage waste related actions, such as recycling, that are practical and relatively easy to undertake, can naturally lead to actions on other important environmental issues such as reducing energy and water consumption.

All of these factors reinforce the importance of a Waste Avoidance and Resource Recovery Strategy for NSW.

Waste Strategy 2007 has been produced in light of current national and international practice, and emerging trends and challenges. It identifies priority actions that will guide the work of all key groups in NSW in contributing to the minimisation of environmental harm from waste disposal and the conservation and efficient use of our resources. The Strategy focuses on solid wastes that, unless recovered and diverted to beneficial uses, would be disposed of to solid and inert waste landfills throughout NSW.

1.1 Data for Waste Strategy 2007

Waste Strategy 2007 is based on more reliable and more extensive data than its predecessor.

Since 2003 the measurement of waste disposal tonnages has been greatly improved through a new electronic reporting system introduced by the then NSW Department of Environment and Conservation (DEC). This system has enabled the capture of data on additional tonnages of materials going to landfill and more accurate analysis and verification than was previously possible. The additional tonnages are for approved operational purposes (such as waste soils used daily to cover the tip face) or materials exempted from the waste levy under the former *Protection of the Environment Operations (Waste) Regulation 1996* (such as waste generated through community service activities including Clean Up Australia).

The new waste data system has been refined and updated to include all of these additional tonnages being disposed to landfill from 2000 to 2004-05. This refinement of the data system has increased the reported total waste disposed of by approximately 250,000 tonnes per annum – primarily in Sydney region tonnages in construction and demolition (C&D) and commercial and industrial (C&I) waste streams.

The new waste data system has also allowed a number of specific waste streams to be measured accurately for the first time. The most important of these new waste streams is virgin excavated natural material (VENM), which is important due to its sheer size. Better data can now identify how much VENM there is and where it is arising, presenting new opportunities for promoting and supporting its reuse[1].

Progress has been made on the collection of recycling and reprocessor data although these data sets still require improvement. Reprocessor data remains un-audited and does not capture every NSW reprocessor. Recycling data has not been collected every year so it involves a degree of estimation and tends to be understated, which in turn impacts on total waste generation data. Some of the problem lies with the fact that material is increasingly being reprocessed on site, either in industrial applications or on larger construction sites, which means it does not enter a stream where it can be measured and reported.

It is not always possible to link performance changes to specific policy, programs or economic settings that have been developed to target waste or resource use. In some cases, the changes and trends described can be attributed to other external factors. For example, there have been substantial changes in recent years in the tonnages of organic waste disposed of and recycled due to recent and ongoing drought conditions across NSW. Another example is growing OH&S concerns relating to asbestos. This appears to be resulting in less source separation and increased disposal of some demolition wastes, including illegal dumping.

The amount of construction and major infrastructure work occurring in different areas in any year also affects performance and resulting data. In particular this can affect the amount of soil and fill generated in a region, the demand for these materials from other potential users, and how much of the material needs to be disposed of.

Finally, it should be noted that major changes in infrastructure have not yet impacted the recovery figures in NSW. It is anticipated, for example, that the UR3R Alternative Waste Technology facility at Eastern Creek and several other major investments will be reflected in future recycling figures.

[1] See also Page 12

2 Performance to date

Waste Strategy 2003 identified waste avoidance and resource recovery goals and targets in four key result areas. These are retained in the 2007 Strategy and are:

1. preventing and avoiding waste;
2. increasing recovery and use of secondary materials;
3. reducing toxicity in products and materials; and
4. reducing litter and illegal dumping.

In 2004 a progress report provided data and described programs undertaken by the DEC and a range of other stakeholders that were contributing to the Strategy's targets and the four key result areas. The 2006 Performance Report published in conjunction with the consultation draft of the Strategy[2] provided a further update of data and programs. This is available as a separate document on the DECC website[3].

Data relating to current performance is also provided in the section below.

2.1 Performance at a glance

Waste disposal and resource recovery in NSW is measured regionally through the Sydney Metropolitan Area (SMA), the Extended Regulated Area (ERA) comprising the Hunter, Central Coast and Illawarra regions and the Non-Regulated Areas (NRA) encompassing the remainder of the State.

The big picture

- NSW is recycling more of its waste in 2004–05 with total recycling in NSW increasing from 45% in 2002–03 to 46% of total waste created. Waste disposal has dropped from 55% of the total tonnes generated to 54%.
- In 2006, NSW recycled 770,000 tonnes of food, garden and wood waste. As compost applied to land, this can save around 500 megalitres of water or the equivalent of 200 Olympic swimming pools by reducing runoff and evaporation.
- More tonnes of waste were generated in NSW in 2004–05 compared with 2002–03 although this does not take into account population growth or economic growth.
- All together, NSW business, construction and households generated around 1.3 million tonnes more waste in 2004–05 than in 2002–03.

Disposal

- Sydney disposed of 7.2% less waste per person in 2004–05 than in 2000; this is 94kg less per person.
- The Hunter, Central Coast and Illawarra regions disposed of 1.3% more waste per person in 2004–05 compared with 2000; this is 12kg more per person.

[2] NSW Waste Avoidance and Resource Recovery – *Strategy and Performance Report 2006* - Consultation Draft (DEC Sept 2006)
[3] www.environment.nsw.gov.au

- Sydney has reduced the amount of waste per $100 spent (GSP) by 11.4% since 2000 (down from 3.12kg/$100 in 2000 to 2.8 kg/$100 in 2004–05).
- The Hunter, Central Coast and Illawarra regions have reduced the amount of waste per $100 spent (GSP) by 1.9% since 2000 (down from 2.05kg/$100 in 2000 to 2.01kg/$100 in 2004–05).

Recycling

- Sydney recycled 49% of the total waste it created in 2004–05 compared with 48% in 2002–03.
- The Hunter, Central Coast and Illawarra regions recycled 50% of their total waste in 2004–05 compared with 47% in 2002–03.
- Tonnages of recyclables (packaging and organics) collected at kerbside in Sydney increased from 125kg per person in 2000 to 137kg per person in 2004–05.
- Packaging collected from kerbside increased from 88kg per person in 2000–01 to 101.5kg per person in 2004–05.

Total waste created

- Sydney generated 390,000 tonnes more waste in 2004–05 (8.9 million tonnes (mt) compared with 8.51mt in 2002–03).
- Between 2002-03 and 2004-05, per capita, Sydney waste generation increased by 3.0%.
- Hunter, Central Coast and Illawarra regions generated 300,000 tonnes more waste in 2004–05 (2.27mt compared with 1.97mt in 2002–03).

2.2 Outcome 1: Preventing and avoiding waste

Waste Strategy 2003 identified a goal of holding level the total amount of waste generated over a five-year period.

Reporting on the total amount of waste generated (created) requires two sets of data, namely, tonnages of waste disposed and tonnages recycled[4]. These two sets of data have only been gathered since 2002–03 so it is not yet possible to make strong conclusions about progress towards this goal. The fifth year for this target will be 2007–08.

Total waste generated

Table 1 below shows the total tonnes of waste generated (waste disposed added together with waste recycled) for NSW as a whole as well as for Sydney and the Hunter, Central Coast and Illawarra regions. Total tonnes generated have increased by 1.3 million tonnes over the 2 years. On the positive side, more of these tonnes are now being diverted to recycling (up from 45% to 46% of total tonnes generated).

In 2004-05, out of the total waste generated in NSW, Sydney generated 68% (8.9 million tonnes), 17% (2.27 million tonnes) was generated in the Hunter, Central Coast and Illawarra and the remaining 15% (1.95 million tonnes) was generated in rural and regional NSW.

[4] This calculation does not account for any materials that are either disposed of or recycled on site; it can only measure tonnages of waste reported as being disposed of or recycled.

It should be noted that the tonnage data provided in this Strategy is different from the data outlined for 2002-03 that was provided in the 2004 Progress Report. This is due to the recasting of the disposal data using the new waste data reporting system and correction of a number of errors in the recycling data (see also section 1.1).

Table 1 also shows that Sydney generated 390,000 tonnes more waste in 2004–05 (8.9 million tonnes (mt) compared with 8.51mt in 2002–03) and the Hunter, Central Coast and Illawarra regions generated 300,000 tonnes more waste in 2004–05 (2.27mt compared with 1.97mt in 2002–03).

In rural and regional NSW data remains quite limited. Reported tonnages have increased substantially between 2002–03 and 2004–05 (626,000 tonnes). This may be attributable to improvements in disposal data since 2002-03 when data was limited to only some licensed rural landfills. Better reporting is identifying larger quantities of waste being disposed of and it is anticipated that this figure will continue to grow as the quality of reporting improves.

Table 1: Tonnes of reported waste generated for the whole of NSW, Sydney, Hunter, Central Coast and Illawarra, and rural and regional NSW – 2002-03 compared with 2004-05

	Total Generation[5] (tonnes)	**% Recycled (all waste streams)**
2004-05		
NSW	13,118,000	46%
Sydney	8,901,500	49%
Hunter, Central Coast and Illawarra	2,268,000	50%
Regional and rural NSW	*1,948,500	*22%
2002-03		
NSW	11,804,000	45%
Sydney	8,513,500	48%
Hunter, Central Coast and Illawarra	1,968,500	47%
Regional and rural NSW	*1,322,000	*28%

* rural and regional data is limited; indicative figures only

Waste generation per capita

The amount of waste we create can also be looked at on a per person (per capita) basis. This measure enables a more direct comparison to be made between different years by taking into account changes in the number of people living in NSW. Table 2 below, shows the amount of reported waste generated in 2002–03 and 2004–05 on a per capita basis. As shown, the total reported waste generated in NSW has increased by around 171 kilograms per person during this period. In Sydney it was 70kg/capita more and in the Hunter, Central Coast and Illawarra it was 213 kg/capita more (across all waste streams).

A greater proportion of the total waste generated by each person is being recycled instead of being thrown away. This is a good trend; however, every single person in NSW still needs to look for opportunities in all aspects of their life to further reduce the amount of waste they create in the first place.

[5] Note that figures are rounded

Table 2: Tonnes of reported waste generated per capita for the whole of NSW, Sydney, Hunter, Central Coast and Illawarra, and regional and rural NSW – 2002–03 compared with 2004–05

	Total Generation (kg per capita)
2004–05	
NSW	1,948.9
Sydney	2,376.1
Hunter, Central Coast and Illawarra	1,767.1
Regional and rural NSW	*1,145.1
2002–03	
NSW	1,777.6
Sydney	2,306.6
Hunter, Central Coast and Illawarra	1,554.6
Regional and rural NSW	*785.6

*indicative only; data is limited

2.3 Outcome 2: Increasing recovery and use of secondary materials

By 2014, NSW aims to increase the recovery and use of secondary materials in the three major waste streams as follows:

- Municipal waste – from a baseline 26% to 66%
- Commercial and industrial (C&I) waste – from a baseline 28% to 63%
- Construction and demolition (C&D) waste – from a baseline 65% to 76%

This section provides data on progress in reducing amounts disposed of and increasing recycling. It should be noted that the tonnage data provided in this Strategy is different from the data outlined for 2002–03 that was provided in the 2004 Progress Report. This is due to the recasting of the disposal data using the new waste data reporting system and correction of a number of errors in the recycling data.

Waste disposal

Together, the Sydney and the Hunter, Central Coast and Illawarra areas produce most of the waste in NSW, disposing of more than 5.7 million tonnes (80.2%) of waste in 2004–05.

There are several different ways of measuring waste: on a per capita basis; by measuring absolute tonnages; or against the level of economic activity. Each of these measures is described in this section.

Per capita waste disposal

Sydney is performing reasonably well in terms of the amount of waste disposed of per person, with an overall decrease in per capita waste disposal of 94kg or 7.2% since the year 2000. This is shown in Table 3.

Table 3: Changes in waste disposal per capita in Sydney by waste stream - 2000 to 2004–05

Year	Municipal (kgs/person)	Commercial and Industrial (kgs/person)	Construction and Demolition (kgs/person)	Total (kgs/person)	% change since 2000 (%)
2000	355	645	315	1,315	
2000-01	349	578	229	1,156	-12.1%
2001-02	340	523	295	1,158	-11.9%
2002-03	321	550	319	1,190	-9.5%
2003-04	302	580	356	1,237	-5.9%
2004-05	272	600	349	1,221	-7.2%

By waste stream, the decrease was strongest in the municipal waste stream, where per capita waste disposal was down 83kg, followed by the commercial and industrial waste stream - down 45kg/person. However, these gains have been partially offset by an increase in the construction waste stream, up 34kg per capita between 2000 and 2004–05.

By contrast, the Hunter, Central Coast and Illawarra regions have increased total weight of waste disposed of per person by 12 kg/person or 1.3% since 2000. This is made up of an increase of 9kg per capita for municipal waste and 49kg per capita for construction waste since the year 2000. Commercial waste has rallied against this trend, down 45kg per capita. This is shown in Table 4 below.

Table 4 : Changes in waste disposal per capita in the Hunter, Central Coast and Illawarra regions by waste stream - 2000 to 2004–05

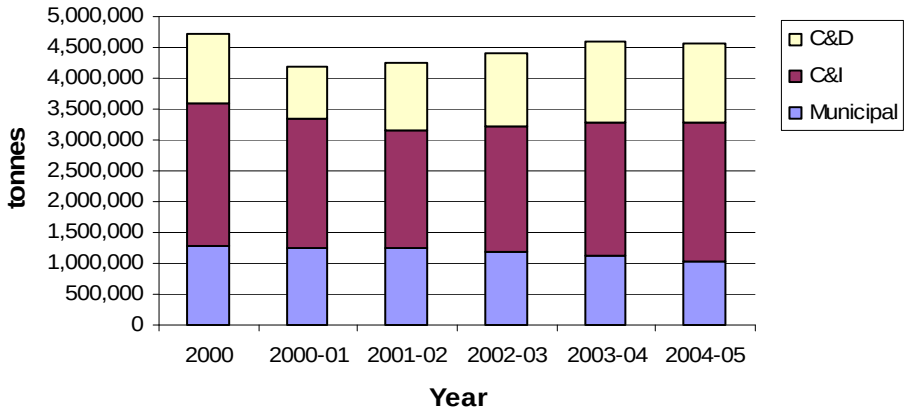
Year	Municipal (kgs/person)	Commercial and Industrial (kgs/person)	Construction and Demolition (kgs/person)	Total (kgs/person)	% change since 2000 (%)
2000	369	327	167	864	
2000-01	362	268	142	772	-10.7%
2001-02	376	253	133	762	-11.8%
2002-03	379	257	183	819	-5.3%
2003-04	387	308	204	899	4.0%
2004-05	378	282	216	876	1.3%

Tonnages of waste disposed

Tonnages of waste disposed of are presented below for the period 2000 to 2004-05. As noted above, however, changes in total tonnages are most useful if they are compared alongside another variable such as population or Gross State Product. For example, considered in isolation, it is difficult to know if an increase in total tonnages is a positive or negative trend. However, if changes in population are known, it is possible to judge the trend. For example, if the population grew by less than the amount of waste, then on a per person basis waste would actually be increasing. Alternatively, if there are more people and businesses in NSW, even though total waste has increased, there could be little actual change (or even a decrease) in the amount generated by each individual or company.

Overall tonnages of waste disposed of in Sydney across all three waste streams were down 3.4%, or 159,176 tonnes, between 2000 and 2004–05.

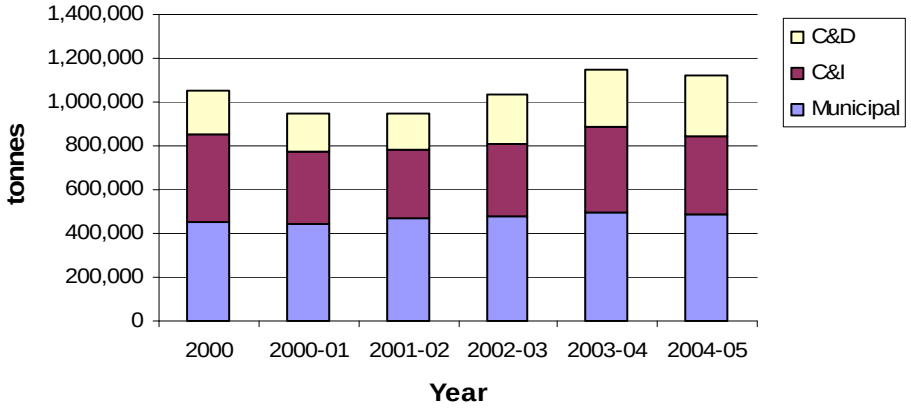
Graph 1: Waste disposal in Sydney - 2000 to 2004-05



Tonnages of municipal waste and commercial waste disposed of in Sydney in 2004–05 were less than in 2000 but these gains were offset by an increase in the amount of construction waste that was disposed of in the same period.

By contrast, and consistent with the per capita trend, waste disposed of in Hunter, Central Coast and Illawarra regions increased 6.5%, or 68,871 tonnes, between 2000 and 2004–05. Tonnages of commercial waste disposed in the period were less than in 2000 but this gain was offset by increased disposal of municipal and construction waste.

Graph 2: Waste disposal in Hunter, Central Coast and Illawarra - 2000 to 2004-05



In rural and regional NSW, improved data is being reported from both licensed and non-licensed landfills. This has provided a different data picture in 2004–05 to the one presented in the previous Strategy. The 2003 Strategy estimated that about one million tonnes were disposed of from all waste streams, but the data was not complete and was limited to rural licensed landfills. Improved 2004–05 data from both licensed and unlicensed landfills suggests that 1,401,685 tonnes were disposed of. It is likely that this increase is mainly due to improved data as well as population and economic growth in regional and rural NSW over the past few years. As disposal data improves even more it is likely that reported tonnages from rural areas will continue to grow.

Waste disposal per $100 GSP

The amount of waste disposed can be calculated against the State's key economic indicator, Gross State Product (GSP), and represented as kilograms disposed of per $100 spent. On this basis there was improvement between 2000 and 2004–05.

Sydney performed best having dropped from 3.12kg of waste for every $100 spent to 2.80kg (down 11.4%). The Hunter, Central Coast and Illawarra regions reduced by 1.9%, down from 2.05 kg per $100 spent in 2000 to 2.01kg in 2004–05[6].

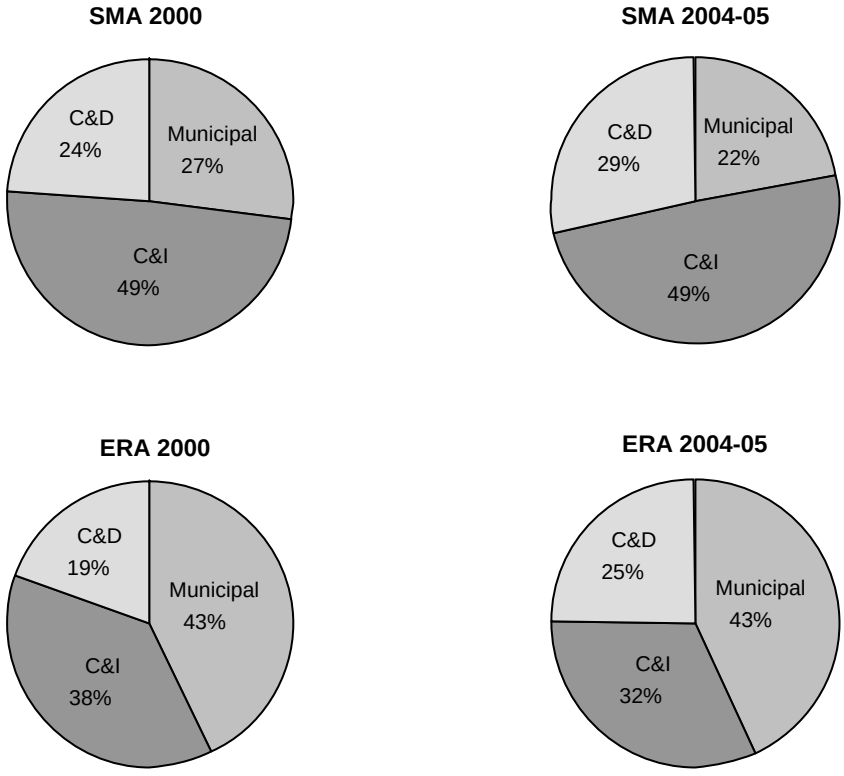
Where the waste comes from

The proportion of waste coming from each of the three waste streams, municipal, commercial and construction has remained largely unchanged since 2000.

In Sydney, commercial waste still accounts for almost half of total waste (49%) disposed of. There is slightly less municipal waste (down from 27% to 22%) and construction waste has increased slightly (up from 24% to 29%).

In the Hunter, Central Coast and Illawarra regions, the municipal waste stream is still the largest (43%). The commercial waste stream has reduced slightly (down from 38% to 32%) and construction waste has increased slightly (up from 19% to 25%).

Graph 3: Proportion of waste in each waste stream for Sydney (SMA) and for Hunter, Central Coast and Illawarra (ERA) - 2000 compared with 2004–5



There is insufficient data to accurately calculate the proportions of waste across the three waste streams in regional and rural NSW. Data from licensed landfills reporting to DEC in 2004–05 suggested that the split was 45% municipal, 27% commercial and 28% construction waste.

[6] GSP data is sourced from ABS Cat No 5220.0 Australian National Accounts: State Accounts.

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 the result of industrial, commercial, mining or agricultural activities. Previous analysis has distributed this material across the three major waste streams. In addition, very little VENM has previously been reported as much of it has been put into landfills and claimed for operational purpose so it was not counted in previous disposal calculations.

The improved data shows that VENM has largely been a Sydney-based issue and that tonnages have increased substantially since 2000 – up from 784,951 tonnes to 1,285,205 tonnes in 2004–05.

Recycling

Recycling data is compiled from a number of sources:

- a DECC state wide survey of companies that reprocess recycled materials;
- information reported by local Councils about amounts and composition of materials collected through kerbside recycling;
- annual analysis of the amount of garden organics being recovered and reprocessed[7]; and
- annual analysis of the amount of plastics being recovered and reprocessed[8]
- recycling tonnages reported to DECC by landfills.

The recycling data set out below is likely to understate the real level of recycling in NSW. This is because material is increasingly being reprocessed on site, either in industrial applications or on larger construction sites, which means it does not enter a stream where it can be measured and reported.

Table 5 shows changes in recycling performance across the three waste streams for the whole of NSW, Sydney and Hunter, Central Coast and Illawarra. For NSW as whole, 46% of total waste was recycled in 2004-5 compared with 45% in 2002-03. By waste stream, 33% of municipal waste was recycled, 38% of commercial waste was recycled and 62% of construction waste was recycled.

The greatest changes have occurred in the amount of C&I waste recycled in NSW (increased by 463,000 tonnes or 34% since 2002-03). There was also an increase of 166,000 tonnes of construction waste recycled (6%) and an increase of 92,000 tonnes of municipal waste recycled. On the disposal side, municipal waste has decreased by 11,500 tonnes for whole of NSW. Commercial waste and construction waste have has increased by 341,000 tonnes and 263,000 tonnes respectively.

[7] National survey conducted annually by Compost Australia; specific NSW data supplied to DEC

[8] National survey conducted annually by the plastics and Chemicals Industry Association (PACIA); specific NSW data supplied to DEC

Table 5: Changes in recycling performance across the three waste streams for the whole of NSW, Sydney and Hunter, Central Coast and Illawarra (ERA) - 2002–03 to 2004–05.[9]

Municipal

	Total Disposed (tonnes)	Total Recycled (tonnes)	Total Generation (tonnes)	% Recycled
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 2004-05	1,021,000	605,000	1,626,000	37%
Sydney 2002-03	1,185,000	595,000	1,780,000	33%
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 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 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* 2004-05	362,000	401,000	763,000	53%
ERA* 2002-03	325,000	269,500	594,500	45%

Construction and Demolition

	Total Disposed (tonnes)	Total Recycled (tonnes)	Total Generation (tonnes)	% Recycled
NSW 2004-05	1,971,500	3,146,500	5,118,000	62%
NSW 2002-03	1,708,000	2,980,500	4,689,000	64%
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* 2004-05	277,000	504,000	781,000	65%
ERA* 2002-03	232,000	473,000	705,000	67%

Total NSW

	Total Disposed (tonnes)	Total Recycled (tonnes)	Total Generation (tonnes)	% Recycled
NSW 2004-05	7,099,500	6,018,500	13,118,000	46%
NSW 2002-03	6,506,500	5,297,000	11,804,000	45%
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* 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

[9] Note that all figures are rounded

Based on all available data, in 2004–05 Sydney recycled 49% of the total waste it created - an improvement on the 48% recycled in 2002–03 and the estimated 38% recycled in 2000[10]. Of the remaining 51% of waste that was not recycled, virtually all was disposed of to landfill. This situation will change with alternative waste treatment facilities more recently coming on line.

By waste stream, more municipal waste was recycled in Sydney - up from 33% to 37% recycled, and the proportion of commercial waste recovered for recycling was also up – from 33% to 35% recycled. However, less construction waste was recycled in 2004–05, down from 68% in 2002–03 to 66%.

The Hunter, Central Coast and Illawarra regions also improved. In 2004–05 these regions recovered 50% of the total waste that they generated – an improvement on the 47% recycled in 2002–03.

By waste stream, the best performer for the Hunter, Central Coast and Illawarra regions was commercial which jumped to a recycling rate of 53% in 2004–05, up from 45% in 2002-03. Municipal waste recycling also increased - up from 28% to 33%. Consistent with Sydney, less construction waste is being recycled, down from 67% in 2002–03 to 65% in 2004-05. As noted previously, one of the driving factors behind the reduction in construction waste recycling is the appropriate disposal of asbestos waste and contamination of other demolition wastes with asbestos.

Data for regional and rural NSW is poor and should be regarded as indicative only. Based on available data for 2004–05, these regions recycled in the order of 23% of total municipal waste, 37% of the commercial and industrial waste and 26% of the total construction waste generated.

Organics recycling

The total amount of organics waste (garden, food, wood/timber, biosolids, agricultural) received by NSW reprocessing facilities increased from 1.34 million tonnes in 2003–04 to 1.41 million tonnes in 2004–05.

As shown in Table 6, since 1998, the proportion of garden organics collected for recycling has increased from 40% to 56% in Greater Sydney (Sydney, Hunter, Central Coast and Illawarra).

Table 6: Tonnage of garden organics recycled 1998, 2002–03 and 2004–05 and as a percentage of total garden waste generated

Garden Organics – Greater Sydney Region			
	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

The majority (80%) of the State's garden waste disposal is in Sydney.

[10] Estimate provided by Wright, 2000: *Report of the Alternative Waste Management Technologies and Practices Inquiry*

Markets for recycled organic materials grew by 6.5% between 2003–04 and 2004-05. This growth occurred in all markets except biofuels, with the biggest growth in the rehabilitation market, which doubled between 2002–03 and 2003–04. Intensive agriculture uses have also grown (10% per year) and extensive agriculture uses have grown at 7% per year.

Kerbside recycling

The performance of kerbside recycling continues to show that efficient systems that are easy to use can deliver good quantities of material for recycling. As council contracts have been reviewed, improved systems have been introduced. Adding together tonnages from both dry recyclables and organics collections, overall collection from kerbside systems in Sydney has increased from 125kg per person in 2000 to 137kg per person in 2004–05.

Kerbside recycling of dry recyclables

More councils are now providing kerbside recycling collections for packaging and paper. 109 councils are now providing kerbside collections, a 7% increase since 2000. On average, 95% of households have access to the service within each council area and average householder participation is constant at 80%.

There has been a big increase in systems using mobile garbage bins since 2001 (up from 50% of councils to 68%), and overall tonnages collected through these systems continue to grow. 593,000 tonnes were collected state wide in 2004-05, compared to 450,000 tonnes in 2000–01.

In Sydney, each person set aside 101.5kg of material for recycling in 2004–05 compared with 88kg in 2000, and recovery per household now amounts to an average of 283kg per year.

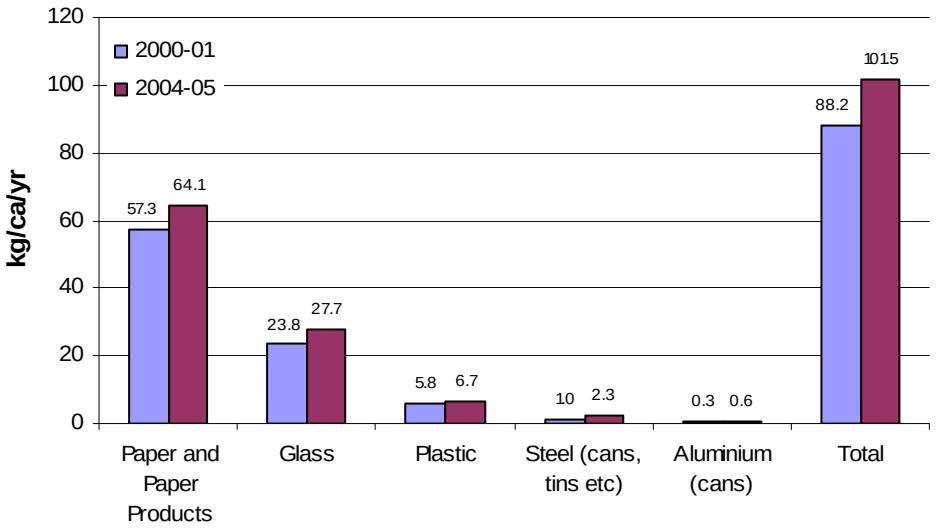
In terms of materials being recycled, there has been an annual increase in the recycling of every major material, with the average householder's annual contribution to recycling in 2004-05 by category as follows:

- 64.1kg of paper and paper products
- 27.7kg of glass
- 6.7kg of plastic
- 2.3kg of steel cans and
- less than 1kg of aluminium cans[3].

Graph 4 below shows changes in the amounts recovered through kerbside recycling of these major materials between 2000-01 and 2004-05.

[3] Survey of Councils' domestic recycling performance for the National Environment Protection Measure (NEPM) 2004-2005

Graph 4: Annual dry recyclables collected at kerbside (kg per capita) - 2000–01 and 2004–05



Kerbside recycling of garden organics

In Sydney more collection systems for garden organics have been introduced with 29 out of 38 councils offering a service in 2004-05. The amount of organic material being recovered per household has remained steady since 2000 at around 94kg.

Contribution to other key environmental drivers

Since *Waste Strategy 2003,* the community has been demonstrating a growing concern about key environmental issues such as water conservation, climate change and greenhouse gas reduction and air quality. In response to this growing community interest, the benefits and contribution from waste reduction and recycling to areas such as water savings, conservation of virgin resources, greenhouse gas reduction and improved soil health are included in this *Waste Strategy 2007* for the first time.

The discussion looks at achievements so far as well as the potential contribution of the additional tonnages that will be diverted with the achievement of the 2014 targets.

Contribution to greenhouse gas abatement

Reducing the amount of waste we put in landfill can reduce greenhouse gas that is created when materials break down in landfills. Recycling organic based materials that decompose can make a big contribution in terms of avoided greenhouse gas. For example, composting 770,000 tonnes of garden, food and wood waste instead of landfilling them avoids almost 1 million tonnes of CO_2 equivalent.[11]

A typical household that is recycling 3.76kg per week (net) is avoiding the equivalent of greenhouse gas emissions from 50% of the electricity used for lighting their home, or 40% of the electricity used for their cooking. On a state wide basis this is equivalent to taking 55,000 cars off the road permanently.[12]

[11] Calculated for DEC by the Recycled Organics Unit, UNSW based on NSW 2006 tonnages : 650,000t of garden organics, 50,000t of food waste and 70,000t of wood waste

[12] Benefits of Recycling (DEC 2005).

Using recycled materials in new products instead of virgin materials can also avoid greenhouse gases. This is because recycling can avoid the gases that are created when the virgin material is transformed into materials for use in products. One of the best examples is aluminium. For every tonne of recycled aluminium that is used, this avoids over 15,000 tonnes of CO_2 equivalent. This is because of the high energy requirement of refining alumina to produce primary aluminium ingots. Substantial greenhouse savings also arise from substituting brown kraft liner made with recycled paper and avoiding the thermo mechanical pulping of virgin wood. A significant benefit is also associated with the recycling of glass, mainly from the avoided processing of soda ash and lime, necessary to produce virgin based glass.

If we consider the 6 million tonnes of waste that was recycled in NSW in 2004-5 and calculate the savings from both not landfilling materials as well as using recycled material instead of virgin, this amounts to a saving of over 3.3 million tonnes of CO_2 equivalent.[13] Continuing to work towards our 2014 recycling targets will increase this contribution even more.

Contribution to water and energy savings

Kerbside recycling makes a significant contribution to water savings, largely by recovering recycled paper that can be substituted for virgin feedstock. This avoids the water intensive wood pulping process for producing virgin fibres. Because the production of aluminium is also a water intensive process, aluminium recycling also contributes high water savings (on a weight for weight basis) by using recycled materials instead of virgin materials.

A typical household can save 3,075 litres of water per year through recycling. This is equivalent to the average water consumption of one person for 12 days or flushing a toilet 615 times. On a state wide scale, some 6,634 megalitres of water is being saved each year through the efforts of households participating in kerbside recycling - enough to fill 2,654 Olympic swimming pools, or the equivalent of between three and five days of Sydney's total water consumption.[14]

By using the 770,000 tonnes of food, garden and wood waste (mentioned above) as compost, this can save around 500 ML of water or the equivalent of 200 Olympic pools by reducing run off and evaporation when the compost is added to soils.[15]

In terms of energy savings, which are the offsets in electricity delivery, process heat and transport, the typical household that actively participates in kerbside recycling delivers a saving of some 928 kilo-Watt hours (kWh) of electricity per year. This is equivalent to 15% of a typical household's total electricity consumption for a whole year, or 8 weeks consumption for each household. Households with high recycling rates can 'save' the equivalent of a third of their total electricity consumption.

On a state wide basis about 2,000 Giga-Watt hours (GWh) of energy are being saved, which is equivalent to the total electricity consumption of approximately 334,000 households or one million individuals for an entire year.[16]

[13] Based on 2004-5 data and GHG conversion factors provided to DEC by Hyder Consulting

[14] Benefits of Recycling (DEC 2005).

[15] Calculated for DEC by the Recycled Organics Unit, UNSW. These water savings are based on some very broad assumptions. These include an application rate of 50 t/ha (may be much higher in urban applications and much lower in agriculture) and water savings of 0.8 ML/ha (cotton growers can save 0.13–0.16 ML/ha whilst viticulture can save 0.95 ML/ha. Much higher rates achievable in urban settings)

[16] Benefits of Recycling (DEC 2005).

Much of the energy savings arise from paper/cardboard recovery, where the energy required for harvesting raw materials, subsequent pulping activities and process heat is avoided. On a weight for weight basis the recycling of aluminium gives rise to the greatest savings, due to the energy intensive electrolytic process used to refine alumina to primary aluminium. The energy savings from recycling HDPE and PET are also high due to the energy products (oil and gas) which are used as feedstock to manufacture plastic.

2.4 Outcome 3: Reducing toxicity in products and materials

Waste Strategy 2003 identified a goal of phasing out priority substances in identified products by 2014 or, if not possible, of achieving maximum recovery for re-use. It also identified a need for a cross sectoral steering group to advise on ways to tackle priority harmful substances.

The Extended Producer Responsibility (EPR) Expert Reference Group (ERG) that was formed to monitor sectors identified in the NSW EPR Priority Statement has been encouraging and monitoring industry efforts to reduce toxicity though a focus on the products nominated in the annual EPR Priority Statement. The ERG provided its first report[17] on progress of those wastes nominated in the Priority Statement to the Minister for the Environment in 2005. The *2005–06 Priority Statement* was released by DEC in March 2006.

The Expert Reference Group has specifically raised the issue of potentially hazardous substances in relation to computers, televisions, other consumer electronics, PVC, batteries, fluorescent tubes and shredder floc. Reports provided by these sectors at the end of 2006 indicated some progress. For example, work is underway to introduce an Australian Standard which will reduce the level of mercury in 25mm lamps. The Lighting Council of Australia has also developed a world first standard to measure mercury content in fluorescent tubes.[18] The use of copper chrome arsenate (CCA) as a preservative has been reduced and use in domestic decking has stopped. The use of other treatments such as creosote, tri-butyl tin and various wood preservatives has also reduced considerably.[19]

NSW is also participating in a process being coordinated by the Australian Government to explore the merits and options for introducing similar requirements within Australia as the European Union Restriction of Hazardous Substances (ROHS) Directive which requires the phasing out of mercury, lead, cadmium, hexavalent chromium and two brominated flame retardants in most electrical and electronic products.

2.5 Outcome 4: Reducing litter and illegal dumping

NSW wants to reduce total volumes and tonnages of litter and illegally dumped material reported by regulatory agencies and Regional Illegal Dumping (RID) squads annually, using 2003 as the base year.

[17] EPR Expert Reference Group September 2005: *Report on the Implementation of the NSW Extended producer Responsibility Priority Statement 2004* (published by DEC 2005)

[18] Correspondence from Australian Electrical and Electronic manufacturers Association (AEEMA) to the DEC in Nov 2006

[19] Report from Timber Development Association (TDA) to the Minister for the Environment and the Expert Reference Group in October 2006

Regular monitoring of the amount and type of litter is undertaken by DECC to capture long-term trends in litter across NSW. *The NSW Litter Report 2004*[20] found that based on a survey of 200 sites across the state, NSW scored as 'moderately clean' (3.8 out of a possible 5)[21]. The rating combined an assessment of bin infrastructure and littering behaviour and attitudes. A litter characterisation survey on 60 of these sites found that by volume, cigarettes, plastics, and paper made up more than 80% of litter; by weight, cigarette butts, paper, and glass comprised 70% of the litter stream.

A further litter characterisation survey was carried out for DECC in 2006. In addition to the 60 sites used in 2004, another 40 sites were surveyed making a total of 100. For the 2006 survey and future surveys materials were categorised slightly differently to the 2004 survey. Seven categories were used: Paper, Beverage litter (containers, lids etc), Cigarette litter (butts, packets), Plastic, Confectionery, Organics and Other.

In 2006, by volume beverage container, cigarette, and paper litter made up 80% of litter, by weight, beverage containers and cigarettes were the major contributors making up 54% of litter. By count, cigarette litter made up 59% of all items, followed by beverage containers at 13%.

The number of fines for littering in 2004–05 was 19% higher than in 2001–02, with 7,256 penalty infringement notices (PIN) issued in 2004–05. Most fines are currently for littering from vehicles and are imposed by local councils and RID squads.

The number of stormwater pollutant devices, sediment traps and litter booms has increased, according to Sydney Water. Litter booms in Sydney Harbour collected 84 cubic metres in 2004–05 compared with 66 cubic metres the previous year; Botany Bay traps collected 32 cubic metres compared with 212 cubic metres previously. Of the 1,859 cubic metres collected in 2004–05, about 25% was non-organic, anecdotally reported as packaging and plastics.

Waste Strategy 2003 committed to establishing a Litter and Illegal Dumping Alliance. This Alliance was formed and has a wide-ranging membership including government agencies, Councils and non-government organisations (NGO). It is chaired by DECC and its role is to guide and coordinate programs to tackle litter and illegal dumping. The Alliance developed a Strategic Action Plan in 2005.

2.6 Other commitments in *Waste Strategy 2003*

Waste Strategy 2003 identified other key actions to support the achievement of waste avoidance and increased resource recovery in NSW. Progress in these areas is summarised in this section.

- The need for better data has been tackled in a number of ways. In addition to the improved waste disposal data system that includes electronic lodgement of data (see section 1.1), formal audits of commercial, industrial and construction waste being disposed of to landfill have been undertaken and will be repeated on a regular basis. These audits have provided important new information and have assisted the development of targeted programs to increase recycling.

- DECC work with the Department of Local Government is delivering more comprehensive data and a streamlined data collection system for local

[20] *The NSW Litter Report 2004*, Department of Environment and Conservation (NSW), Dec 2004

[21] Assessment used the Clean Communities Assessment Tool (CCAT) owned by Community Change

councils. Improved data will also be provided as part of the annual performance payments scheme introduced for local councils in 2006 (see section 3.1).

- The annual DECC survey of reprocessors is helping to establish tonnages being recycled within NSW. A revised NSW reprocessor survey is being used to collect the 2005-06 data to improve its quality.

- Establishment of whole-of-supply chain monitoring, reporting and product stewardship initiatives has been progressed through the release of NSW *Extended Producer Responsibility Priority Statement*s in March 2004 and March 2006, the formation of an Expert Reference Group (ERG) appointed by the Minister for the Environment to evaluate sector performance, and DECC work with a number of the sectors identified in the statement (see section 3.7).

  Work has continued with sectors to improve performance and reporting of progress for existing national schemes for mobile phones, agricultural and veterinary chemicals, chemical containers and polyvinyl chloride. This has resulted in more detailed and comprehensive data being provided for NSW. DECC has also been working with industry and other jurisdictions to implement product stewardship initiatives for computers, televisions, tyres and plastic bags, office paper and treated timber.

- To provide an impetus to thinking about waste avoidance, a DEC discussion paper *Producing and consuming efficiently to conserve our resources*[22] was produced. This was informed by workshops and consultation with community organisations, industry and local government. NSW also contributed funding to the research by the Australia Institute on Wasteful Consumption in Australia (see section 3.5).

2.7 Key programs that are contributing to NSW waste reduction performance

To fulfil its role in leading and coordinating programs that are contributing to Strategy targets and outcomes, DEC has initiated or facilitated a wide range of waste reduction and resource recovery programs. Key areas for action have included:

- better data
- improving understanding of community attitudes and motivations
- supporting markets for recycled materials
- better recovery systems and waste management
- decision making and guidance tools
- government agency initiatives
- identifying partnership opportunities
- better Industry practices and
- producer responsibility.

Details about DEC programs were provided in the 2006 Performance Report that was published in conjunction with the consultation draft of the Strategy.[23]

[22] *Producing and consuming efficiently to conserve our resources*, Department of Environment and Conservation (NSW), February 2004

[23] Available on the DEC website www.environment.nsw.gov.au

In addition, actions by industry, other government agencies, Councils and other organisations are contributing to continued waste reduction and resource recovery in NSW. Key initiatives that will make a substantial contribution over the next 3 years include:

New Infrastructure or systems – commenced or currently being implemented

- The UR3R-WSN/GRL joint partnership at Eastern Creek
- Macarthur councils-(Camden , Campbelltown, Wollondilly and Wingecarribee) Regional contract to build an AWT (ArrowBio); starts January 08
- Southern Councils Group (Bega Valley, Eurobodalla, Kiama , Shellharbour, Shoalhaven, Wingecarribee, and Wollongong) - Regional Contract
- New Visy MRF at Smithfield
- Coffs Harbour - new AWT Biomass. Regional facility (Coffs Harbour, Nambucca, Bellingen Councils) mid 2007
- New garden waste recycling services for households in Penrith, Liverpool, Baulkham Hills and Ryde
- New C&I MRF in West Gosford

In Planning stage

- Hunter Integrated Resources (Cessnock, Lake Macquarie, Maitland and Newcastle) - Regional AWT facility
- Visy (Tumut) – Plant upgrade announced; increase in paper recycling capacity
- Visy Smithfield packaging and recycling facility upgrade; increase in recycling capacity
- AMCOR (Botany) Plant upgrade announced; increase of paper recycling capacity
- Benedict Sand and Gravel – proposed wood waste co-generation plant
- Blue Circle Southern Cement – non standard fuel investigations (including wood waste)
- New municipal MRF at Somersby
- Orange Reprocessing centre

Policies/Planning (Department of Planning)

- New Infrastructure SEPP

3 Emerging drivers and challenges

In preparing *Waste Strategy 2007*, DECC has reviewed recent environmental, economic and social trends, as well as emerging issues that are influencing waste reduction and waste management. This includes national and international trends and issues.

The underlying policy drivers behind *Waste Strategy 2003* were the need to maximise conservation of our natural resources and to minimise environmental harm from waste management and disposal. These drivers are even more important in 2007 against a backdrop of a growing population in NSW and a healthy economy that is producing more goods and services.

The Strategy framework provides one of the checks and balances needed to ensure that efficient resource use and impacts on the environment are considered throughout the life cycle of goods and materials, including extraction, manufacturing, distribution, consumption and recovery for reprocessing or disposal.

These environment protection and resource conservation drivers are not just strongly supported but increasingly demanded by a community that is becoming more knowledgeable and more attuned to the threats and limitations to many basic resources, such as water, energy, raw materials, habitats and atmospheric gases, that previous generations took for granted.

Some of the key changes and emerging drivers since 2003 are discussed below.

3.1 Legislation and policy drivers

Waste management and resource recovery policy in NSW is not static. A number of key policy changes have occurred since 2003 in response to improved data, performance of existing policies, technological improvements, changing economics of the waste management and resource recovery industry, community expectations and stakeholder concerns.

NSW's major economic instrument for waste, the Waste and Environment Levy (the Levy), has been reviewed and changes were announced in late 2005. In July 2006 scheduled increases to the Levy were introduced, with the levy increasing by an additional $6 per tonne over the next five years (plus CPI adjustments). This means that by 2010–11 the Levy will reach $56 per tonne in the SMA and $52 per tonne in the ERA (excluding CPI).

The new Levy aims to provide stronger incentives to reduce waste to landfill and to encourage increased resource recovery and recycling. Higher disposal costs will help make innovative recycling and recovery waste processing options more attractive and competitive for potential investors and existing companies within the waste collection and reprocessing sectors. The Levy will also fund a substantial range of environmental programs, including an annual performance payments scheme for local government in the leviable area; to reward waste reduction and help deliver improved waste service performance standards.

Analysis of the Levy's impact to date has shown that it has already been an important driver and encouraged more recycling, particularly for large tonnages of materials and for heavy wastes such as construction and demolition waste. Increasing the Levy will distribute this effect across a greater range of materials. It will also encourage the

establishment of additional recycling capacity by providing a financial offset that enables recyclers to more easily compete with disposal facilities for materials.

Progressive increases in the Levy over the past few years have also assisted organics recycling by making the cost of recycling more competitive with landfill. For example, garden organics recycling in the Greater Sydney Region has increased from 40% of the total generated in 1998 to more than 57% in 2004-05. While no coordinated organics recycling existed in NSW in 1990, by 2005 there were 61 licensed composting facilities and 87 local Councils[24] provided regular garden organics recycling services in 2004-05, up from 71 in 2002-03. NSW is now leading the nation in organics recycling.

At the same time it is recognised that increases in the Levy might trigger other pressures that will need to be addressed by innovative regulatory and enforcement approaches. In particular, rising costs for the proper management of waste are likely to increase the likelihood of illegal dumping, and might lead some to pursue 'reuse' strategies that would unacceptably harm the environment. These potential avenues for environmental harm have been recognised and programs have been developed to address this, including recent amendments to the *Protection of the Environment Operations Act 1997* (the Act) and the associated regulations. For example:

- Legislative changes have been made to the definition of waste in the *Protection of the Environment Operations Act* to distinguish bona-fide waste reuse opportunities from more traditional forms of managing waste for disposal. These changes will provide industry with the incentive and certainty required to pursue further reuse and recovery opportunities.
- A new Land Pollution Offence has been included in the Act to protect landholders and the environment from damage caused by the inappropriate application of harmful substances to land.

Amendments have also been made to the *Protection of the Environment Operations (Waste) Regulation 2005* to create an integrated, streamlined system for 'waste tracking'. 'Waste tracking' is used across Australia to minimise the possibility that wastes will be transported or disposed of inappropriately. The new regulations have delivered a clear, practical and enforceable system to ensure the appropriate transport and disposal of high-risk wastes.

In addition to legislative and regulatory changes since *Waste Strategy 2003* was released, a number of policy statements have reinforced some basic principles that underpin policy and regulatory settings in NSW. These include a statement on the importance of source separation of recyclables, which is one of the cornerstones of resource recovery. Separation of recyclable material from wastes at the point where the waste is created leads to the recovery of much better quality material. This means that it can potentially be recycled into a far wider range of quality uses. By contrast, mixing recyclables and waste together can limit re-use as well as adding unnecessary sorting costs.

Councils have also been encouraged to limit their contracts for waste disposal to landfill to shorter terms rather than the 20-year agreements that have characterised

[24] Data derived from NEPM (2004/05). Note that this figure includes 47 councils with kerbside collections, 17 councils with a garden organics cleanup service (but no kerbside collection) and 23 councils that offer 'other residential' recycling services only (e.g. drop-off).

contracts in the past. This will enable Councils to maintain maximum flexibility in responding to new, emerging technologies for recovering wastes.

3.2 Technology and infrastructure changes and challenges

As foreshadowed in *Waste Strategy 2003*, policy, regulatory and economic settings in NSW have been driving increasing demand for new recycling technologies to recover and utilise more materials and for alternative waste technologies to treat the residual portion of waste that would previously have been disposed of to landfill. These technologies are especially relevant for councils in the Sydney, Newcastle, Central Coast and Wollongong areas. Some major regional centres might also provide sufficient material to justify alternative treatment plants, particularly where there are potential opportunities to combine with neighbouring councils in areas of high growth. The application of new technologies is less likely to be a viable option in rural areas, where a small population base is coupled with high transport costs.

The challenge for future technologies is to ensure that final outputs provide sufficient environmental, economic and social benefits to justify the investment and minimise harm to the environment or human health.

Another key driver for future infrastructure will be its capacity to process different feedstock. Factors such as the type of waste, surety of supply, international market prices, availability of substitute raw materials, market demand for outputs and government policy settings will all affect the waste that a facility has available to it. It will therefore be important for it to be able to adapt to changes in feedstock without substantially threatening its economic viability.

In the medium term, NSW is likely to see a growing trend towards integrated waste management approaches that employ both residual waste treatment and recycling.

The growing demand for purpose-designed infrastructure will bring challenges for infrastructure planning and guidance. These will need to play an increasingly important role in either supporting or restricting opportunities for increased resource recovery. The challenge will be greatest where new facilities are established to service the existing, ever-consolidating Metropolitan Region. Facilities will need to be installed at locations that optimise logistics since logistics costs constitute around 60% of the total waste management value chain. Logistics relate to distance travelled, access issues and the relationship to the network of facilities such as transfer stations, material recovery facilities (MRF) and alternative waste technology (AWT) facilities. These are some of the most important factors influencing the commercial success of a waste management operation.

Building facilities close to waste sources is more feasible for new development areas. Early planning can reduce land use conflicts and can also enable the trialling of innovative waste management concepts including new schemes for source separation, collection, and transfer.

To facilitate improved infrastructure planning, the NSW Government has introduced a new project approval regime for the assessment and approval of major projects by the Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979*. This approval regime and the State Environmental Planning Policy (SEPP) – Major Projects were gazetted in August 2005.

The SEPP defines certain waste infrastructure developments as major projects to be determined by the Minister for Planning under Part 3A. Criteria for resource and

waste related infrastructure projects are set out in Schedule 1 of the SEPP. Many new waste, resource recovery and recycling facilities will now be assessed and determined by the Minister for Planning.

A new draft Infrastructure SEPP which consolidates and updates planning processes for new infrastructure also underwent public consultation in 2006 and will be gazetted in 2007. This SEPP streamlines planning provisions by identifying classes of infrastructure development that can be approved by consent authorities without the need for a formal development consent process if the development does not significantly affect the environment. The SEPP lists zones that have been identified in relevant Environmental Planning Instruments, such as Local Environment Plans, for waste management facilities and waste transfer stations. The new SEPP should assist the development of these facilities in the future.

The Department of Planning is currently preparing a discussion paper to underpin the development of a waste and resource recovery infrastructure strategy for the Sydney metropolitan area. The proposed strategy is intended to guide private sector planning and decision-making.

There have been major improvements in recovery infrastructure and systems since *Waste Strategy 2003* was released. A number of councils have improved their municipal waste management through adopting better practice in collection systems, assisted by benchmarking of good practice by various DEC programs. In addition, co-operative agreements between groups of councils are delivering regional processing arrangements that aggregate the waste and recyclable material. Such approaches are contributing to substantial benefits such as:

- reduced environmental impacts
- high quality municipal waste management services for smaller councils
- stabilised pricing and provision of price certainty over the period of the contract
- maximised resource recovery and reduction in material disposed to landfill
- improved householder behaviour/practice through consistency of services and information delivery
- community access to state-of-the art recycling facilities and best practice collection services and
- savings through cost sharing between participating councils for such things as legal costs, production of information and implementation of education programs.

3.3 Market development for recycled content products

Successful waste reduction and resource recovery relies on healthy markets for the materials that are sent for recycling. In recent years, a growing number of consumers, especially governments and businesses, have been using their purchasing power to develop markets for materials with recycled content. Examples include use of recycled materials such as glass fines in asphalt; application of recycled organics to stop erosion along roadsides and to reduce water use in managing parks and gardens; and using tyres as an alternative to existing building materials or as a substitute to standard fuels. NSW state government agencies and Councils are also respectively supporting purchase of recycled content materials through their Waste Reduction and Purchasing Plans (WRAPP) and the Council *Sustainable Choice* program.

However, choosing recycled content products is still not a widespread practice. Extensive research conducted for DEC across industry, state and local government[25] clearly identified price and performance as the major drivers for purchase for goods and services.

Many recycled content products find it difficult to compete on price. This is because reduced demand leads to smaller production runs, which in turn increases the per unit price. Solving this depends on encouraging purchase by more users, especially larger buyers such as big corporations and governments, but there is a reluctance to adopt new products without clear evidence of an economic benefit from their use. Governments and major companies therefore have a clear role to play in market development as they have considerable purchasing power and can influence demand for environmentally friendly products.

Other key barriers include lack of information about availability of alternatives, environmental benefits and product performance as well as lack of warranties or guarantees. In the absence of reliable technical data on the applications and the benefits of products with recycled content, adoption will continue to be slow. Other barriers to purchasing recycled content products include organisational structure, lack of leadership and corporate procurement policy drivers, and fear of changing established purchasing practices.

Despite the ongoing challenges, there has been some increased use of recycled content products over the past few years, which has enabled some benefits to be quantified. These include environmental benefits such as reducing the need for virgin materials and reduction in greenhouse gas by substitution with recycled materials. Economic benefits have included cost savings and performance and workability advantages. [26]

3.4 Research to support recycling and waste reduction

Research projects conducted or supported by DEC over the past few years have illustrated the benefits of recycling and will assist those who are advocating or adopting changed practices to deliver new or improved systems for their community. Other research has been undertaken to assist with understanding of current broad community or specific stakeholder group perceptions, knowledge and behaviour about a range of issues such as waste, recycling, waste avoidance, use of and purchase of recycled content products and linkages between waste and other environmental and sustainability issues. A list of recent research is included in Appendix 1.

3.5 Reducing waste generation

Tackling consumption is perhaps the greatest challenge facing efforts to reduce the amount of waste produced by our society. The amount of waste we create is strongly linked to how much we spend and buy. Increasing consumption is a global phenomenon, due mainly to growing affluence in many countries. It is also due to changes in lifestyle, with demand for smaller food portions, individual pre-prepared food portions, and growing health and safety issues.

According to the OECD, global per capita private consumption has increased steadily over the last two decades, and is expected to continue to follow GDP growth in the period to 2020. Between 1995 and 2020, household waste is projected to grow by

[25] *Encouraging demand for product with recycled content,* December 2004, undertaken by Instinct and Reason Pty Ltd

[26] See 2006 Performance Report P 16-18 DEC (2006)

43%. Although recycling rates have also increased, slowing the growth of waste destined for final disposal, total volumes of waste produced continue to grow.[27]

Trends in Australia demonstrate a similar picture. In 2003 the Australian Bureau of Statistics (ABS) reported that Australians were consuming more resources and generating more waste than at any time in our history. This was mainly due to our growing population and increasing high standard of living. The ABS concludes that Australia is among the top 10 solid waste generators among OECD countries and without changes to consumption patterns this trend will continue.[28]

Recent research into consumption patterns in Australia by The Australia Institute (March 2005)[29] showed that in 2004 the average Australian household wasted $1,226 on items purchased but not used (equivalent to approximately one month's repayments on an average Australian home mortgage). More than $10.5 billion dollars is spent each year on goods and services that are never or hardly ever used. Food was the biggest item, at a total cost of $5.3 billion. The report concluded that Australians live a contradiction – they express concern about the environment but live wasteful lifestyles.

In New South Wales there has been great support for and participation in recycling since the early 1990's and this is where governments and communities have focussed their efforts, education and infrastructure. Equivalent actions to reduce consumption and encourage a reduction in waste generation are much harder to find, although there are examples at the company level through cleaner production programs, and in offices through reduced paper use. Perhaps the most recent example is the reduction in plastic bag use by the community.

The Australia Institute Report also highlighted some new issues that are going to make the task of reducing consumption even more difficult. It identified a whole new psychology that is emerging relating to compulsive shopping and retail therapy. According to the research, improved self-concept and getting pleasure through the act of shopping itself (as opposed to the goods actually purchased) are becoming powerful drivers of consumption. The report warned of a possible anti-environmental backlash from continued pressure to change behaviour, increasing denial about the extent of the problem, or blaming others to avoid changing behaviour.[30] It suggested possible action for two areas of neglect: innovation in product service delivery systems, and economic and social policies that encourage a shift to non-consumptive means of achieving well-being[31].

3.6 Community support and expectations

Strong community support for waste reduction has been demonstrated by increasing household recycling rates and participation in other waste programs. In 2004, Sydney residents set aside, on average, more than 100kg of material for recycling, which was 17kg more than in 1990. There has also been an increase of 30% over three years in attendance at household chemical drop off sites, with over 43,000 people depositing more than 1.5 million kg of chemicals.

[27] '*Towards sustainable household consumption? Trends and policies in OECD countries',* OECD Policy Brief, July 2002, pp 3-4

[28] *Australia's Environment: Issues and Trends*, Australian Bureau of Statistics, ABS Catalogue no. 4613.0, July 2003, pp. 133-135 and 156

[29] Wasteful Consumption in Australia, Discussion Paper No 77, Australia Institute, March 2005

[30] Ibid pp. (xi)

[31] Ibid pp. 12

The '*Who Cares about the Environment in 2006?*'[32] showed that the people of NSW continue to value the environment, with 93% of the respondents saying the environment is important or very important to them. More than half the respondents (53%) ranked the environment third in importance to them after family and friends.[33]

Recycling and waste disposal are among the issues considered important by the majority of those respondents to the 'Who cares' survey who ranked waste as a significant issue for NSW. Management of plastic bags, reducing packaging waste and litter and illegal dumping were specific issues highlighted by respondents as important areas for action.

The community also strongly supports waste reduction measures with more than 60% of respondents to the 'Who Cares' survey saying that they adopted such measures as product re-use, choosing more environmentally friendly household products, avoiding the use of plastic bags and avoiding products with excessive packaging.

The survey also showed that the community wants to see further improvement in waste avoidance, with more people in NSW (up from 19% to 26%) considering that the situation with regard to reducing the amount of waste that community generates is getting worse or much worse compared to 2003. More than half of the respondents (55%) thought that households should pay a charge based on the volume of the waste that they produced.

The community also continues to have high expectations of Government to use a range of policies and tools to encourage efficient use of resources and to discourage unnecessary disposal. The 'Who Cares' survey showed that only 17% of people in NSW thought that the NSW Government was doing enough to protect the environment and 81% thought that the Government needs to do more. With regard to environmental regulations, the survey showed that:

- 96% of people in NSW believe that the aim of environmental regulations should be to improve rather than merely maintain the health of the environment
- 68% disagree with the proposition that environmental regulation is restricting or holding back the NSW economy and
- 77% reject the idea that a lower level of environmental regulation is required in NSW.

3.7 Product stewardship and producer responsibility

Since *Waste Strategy 2003* was released more companies and sectors have been re-examining the life-cycle impacts of their products and services. This is in response to growing community expectations that industry will take greater responsibility for its products at end of life.

Pressure for more industry action to better manage and recover their products at end of life is occurring worldwide. In Europe this is being strongly driven through EU regulations that set targets for take back and recycling of products for specific sectors. In the US there is a stronger focus on voluntary industry programs.

Many companies selling in Australia are internationally based and are already having to comply with the design and recycling requirements imposed overseas. Australian companies exporting worldwide must comply in order to compete in overseas

[32] *Who Cares about the Environment in 2006: A survey of NSW people's environmental knowledge, attitudes and behaviour*, DEC, November 2006
[33] Ibid

markets. Most companies are also finding that sound environmental credentials can provide a positive marketing edge.

Governments across the country have been concerned to ensure that Australia does not become a dumping ground for inferior products through lack of action. They will be continuing their EPR (extended producer responsibility) work through the work of State Environment Ministers and the national Environment Protection and Heritage Council.

The EPR challenge for governments and industry sectors in Australia stems from the fact that there is no single solution or system for managing end of life products and solutions will need to be purpose-designed and tailored to the characteristics of the Australian supply chain for each particular product. Implementation of overseas approaches will not directly translate into successful schemes in Australia due to the nature of our economy, population size and distribution.

NSW has participated in and is strongly supportive of voluntary, national solutions. A large percentage of the consumer goods that we use are now imported and many companies selling product in NSW sell throughout Australia as well as producing and selling internationally. Australia's ability to influence the product design of companies manufacturing goods in other countries for an international market is extremely limited due to Australia's market share (often less than 1%). This limits NSW's ability to unilaterally drive reductions in the use of potentially toxic materials used in products as well as re-use and recycling schemes. Working nationally increases NSW's ability to influence product sector commitment and initiatives.

A national council of environment ministers (Australian Government, states, territories and New Zealand) called the Environment Protection and Heritage Council (EPHC), has been addressing product stewardship for sectors for some years. This includes mobile phones, computers, televisions, tyres, plastic bags and packaging. Ministers have signalled their aim to see lightweight plastic bags phased out by the end of 2008. Voluntary agreements are being negotiated for tyres and TVs and mobile phones. Regulatory options are being considered for computers due to the fragmentation and large number of players in the sector and its inability to coordinate a voluntary approach.

In addition, a voluntary National Packaging Covenant was renewed in July 2005 for a further 5 years. This is underpinned by regulation in all states to capture 'free riders' and require them to take action that is comparable to those who have joined the voluntary Covenant. This maintains a level playing field in the marketplace. A mid term review of the Covenant will be conducted by end 2008 following which EPHC will signal whether a different approach is needed to reduce packaging.

NSW has also used its annual EPR Priority Statement process to identify 'wastes of concern' and start an ongoing dialogue with a range of sectors. These includes office paper, timber, batteries, paints and other electrical products such as large electrical products and lighting.

The NSW community expects all sectors and especially those nominated as wastes of concern in NSW to increase their efforts to improve design, cut down on manufacturing waste, and actively drive initiatives to increase recycling of end of life products. Such actions clearly need to be economically viable, simple for the community to use, and to deliver results that are positive for the environment in terms of saved resources and reduced impacts.

4 Waste Avoidance and Resource Recovery Strategy 2007

The NSW *Waste Avoidance and Resource Recovery Strategy 2007* is designed to provide a continuing framework that will guide actions to achieve the Government's policy objectives of minimising environmental harm from waste generation through to disposal, and conserving and maximising resource use.

4.1 Principles

Waste must continue to be tackled across the whole life cycle of goods and materials including extraction, manufacturing, distribution, consumption and recovery for reprocessing or disposal. Action to avoid and prevent waste needs to be considered at every step in this cycle with a focus on those points in the chain where the impact and results will be most effective.

Waste Strategy 2007 continues to recognise the importance of the waste hierarchy to guide effective resource management. It acknowledges, however, that different materials require different approaches. The choice of approach, including re-use, recycling and energy from waste, will depend on a balance of factors including economic and environmental considerations. Other factors that will influence the approach adopted for specific materials include: availability of supply; markets for recyclate; economic; environmental and social impacts; community responses to different collection; reprocessing and disposal options; and emergence of new technologies.

All other principles identified in *Waste Strategy 2003* remain important and will continue to underpin NSW policy and actions to conserve resources and reduce waste. These principles include a commitment to ecologically sustainable development[34] as well as other principles set out in NSW legislation and international instruments. In summary these principles are:

- *the precautionary principle* – lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation if there are threats of serious or irreversible environmental damage;
- *inter-generational equity* – the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations;
- *polluter pays* – those who generate pollution and waste should bear the cost of containment, avoidance or abatement;
- *full life cycle costing* – users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste;
- *market incentives* – environmental goals should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems;
- *shared responsibility* – industry should share (with the community) the responsibility for reducing and dealing with waste[35];

[34] See section 6(2) of the NSW *Protection of the Environment Administration Act 1991*

[35] sub-section (3)(e), *Waste Avoidance and Resource Recovery Act 2001*

- *system integration* – waste and resource management planning, programs and service delivery need to be integrated on a State-wide basis [36];
- *sustainable production and consumption* – environmentally sound waste management must go beyond the mere safe disposal or recovery of wastes that are generated, and should seek to address the root cause of the problem by attempting to change unsustainable patterns of production and consumption[37];
- *public involvement in decision-making* – environmental issues are best handled with the participation of all concerned citizens, who should have full opportunity to participate in decision making processes, including appropriate access to all relevant information on the environment held by public authorities[38];
- *economic development* – environmental protection should constitute an integral part of the development process and cannot be considered in isolation from it[39];
- *continuous improvement* – policy and actions should support and seek to deliver continuous improvement in the frameworks, infrastructure and systems established to support waste reduction and resource recovery[40];
- *contribute to other environmental sustainability issues* - policy and actions on waste should support and identify their contribution to other key environmental issues such as greenhouse gas abatement and reduction in energy and water use.

The need to work with other jurisdictions in Australia to address waste and resource recovery problems also continues to be cornerstone of the NSW *Waste Strategy*. Many issues cut across State and Territory boundaries due to the increasingly transboundary nature of business activities. Such national approaches operate under the Environment Protection and Heritage Council (EPHC).

4.2 The broader sustainability context

Since *Waste Strategy 2003* was released, there has been a growing understanding that actions to tackle particular environmental or resource use issues are strongly interconnected.

Mounting scientific research is quantifying the benefits and impacts of waste-related actions to other parts of the environment, such as water savings, conservation of virgin resources, greenhouse gas and soil health. This helps to involve and motivate people who might not be so focussed on waste and resource issues per se but will take action because of its related environmental benefits. Social research is also demonstrating that waste actions can naturally lead to actions on other environmental issues such as reduction in energy and water consumption.

There is also an increasing preference to address overall environmental performance rather than focus on single issues, especially by industry. Companies tend to incorporate waste related actions through programs that aim to build on environmental responsibility (compliance), cleaner production efforts, environmental policy and

[36] sub-section (3)(g), *Waste Avoidance and Resource Recovery Act 2001*

[37] *Agenda 21*, UN Conference on Environment and Development, June 1992, paragraph 21.4

[38] Sub-sections (3)(b) and (3)(c), *Protection of the Environment Operations Act 1997*
(See also *Principle 10 - Rio Declaration on Environment and Development, 1992*)

[39] *Principle 4 - Rio Declaration on Environment and Development*, *1992*

[40] sub-section 12(2)(a), *Waste Avoidance and Resource Recovery Act 2001*

planning, supply chain management, internal (staff and contractor) and external stakeholder engagement, as well as regional or sector wide sustainability leadership.

4.3 Key result areas

The key result areas and targets identified in *Waste Strategy 2003* have been retained. They remain relevant in the current NSW economic, environmental and social climate. While they are ambitious, the targets are also realistic goals that will continue to provide an impetus for action across all sectors.

The four key result areas are:

- preventing and avoiding waste
- increasing recovery and use of secondary materials
- reducing toxicity in products and materials and
- reducing litter and illegal dumping.

Broad targets for each key result area

Preventing and avoiding waste	To hold level the total waste generated for 5 years from the release of *Waste Strategy 2003*.
Increased recovery and use of secondary resources	By 2014, to: Increase recovery and use of materials from the municipal waste stream, from 26% (in 2000) to 66% Increase recovery and use of materials from the commercial and industrial waste stream, from 28% (in 2000) to 63% and Increase recovery and use of materials from the construction and demolition sector, from 65% (in 2000) to 76%.
Reducing toxic substances in products and materials	By 2014 or earlier: To phase out priority substances in identified products as a first choice or, if not possible, to achieve maximum recovery for re-use.
Reduce litter and illegal dumping	Reduce total amount of litter reported annually. Reduction in total tonnages of illegally dumped material reported by regulatory agencies and RID squads annually.

In addition, the NSW Government has recently adopted the *State Plan, A New Direction for NSW*. One of the five focus areas within the State Plan is Environment for Living. Improved waste minimisation and management contributes to the following priorities listed under Environment for Living:

- Priority E1: A secure and sustainable water supply for all users
- Priority E2: A reliable electricity supply with increased use of renewable energy
- Priority E3: Cleaner air and progress on greenhouse gas reductions
- Priority E4: Better outcomes for native vegetation, biodiversity, land, rivers and coastal waterways.

Conserving our resources and reducing the amount of waste we put in landfill can make a substantial contribution to each of these priorities (see section 2.3).

4.4 Framework for action

DECC will continue to provide the lead in implementing *Waste Strategy 2007*, however it is clear that continued support and collaboration will also be needed from other groups, including local government, industry and community. Local Councils in particular play a pivotal role in many areas relating to waste and recycling. Programs are run by individual Councils, in partnership with the NSW government or as part of a regional approach with other Councils and sometimes local businesses. Key NSW Government-Council collaborative projects include illegal dumping squads and education, sustainable purchasing, using recycled content materials, household chemical collections, community education and work with small and medium businesses to improve waste management.

In many cases, programs run by DECC or other stakeholders will contribute to results in more than one of the outcome areas identified in the Strategy. Key areas where action is needed are discussed below. A three-year outlook and an outline of priority work needed in the medium term are also provided. This is based on a consideration of the changes and emerging challenges that were discussed in the previous Chapter.

Programs that DECC will implement in key action areas are also included. Programs are designed to contribute to the outcomes in the Strategy and a summary of key programs and their contribution to the Strategy result areas is provided in Appendix 2. Not all programs contribute directly to increased tonnages diverted from landfill or increased recycling. Some have more indirect, longer term effects that need to build up over time. For example, programs that focus on capacity building with particular groups to provide knowledge and skills to take actions on a range of sustainability issues, including waste programs that focus on collecting better data and improving knowledge and reporting, education programs, product stewardship programs and programs that test performance of recycled materials e.g., organics.

Waste avoidance is not included as a discreet program area. This is because, consistent with the growing desire for a more integrated approach to environmental issues, action to avoid waste needs to be part of a broader program that is tackling either waste related or sustainability issues. DECC programs that have a strong waste avoidance component are briefly described at the end of this section.

Providing a supportive policy and regulatory framework

Focus for action

- *Supporting regulation under Protection of the Environment Operations Act 1997 to enable exemptions for wastes or waste derived materials used as fuel or applied to land*
- *Increased awareness activities coupled with consistent regulatory action to encourage better waste management practices*
- *Continued guidance for Councils about emerging waste management and technology issues, including food waste*

Providing industry with regulatory certainty

In May 2006, the *Protection of the Environment Operations Act 1997* (the Act) definition of waste was amended to provide the ability to clearly delineate where waste or waste derived substances that are land applied or used as fuels no longer need to meet the regulatory requirements for waste.

The Act's definition of waste states that waste includes "any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations". This amendment will become effective when the supporting regulation is made to provide greater certainty to those involved in resource recovery operations. It is proposed that the regulation would allow exemptions to be made for wastes or waste derived materials used as fuel or applied to land where it was shown that the proposed application was of benefit, did not cause harm and is fit for purpose.

This refinement of the regulatory framework will help further stimulate recycling and resource recovery whilst ensuring that our environment is protected.

Protecting the environment from unacceptable waste practices

DECC will continue to promote compliance by assisting waste operators to understand and meet their legislative obligations while taking strong and consistent regulatory action against those who choose not to comply with the law.

Between July 2003 and June 2006, DEC's Sydney Waste Section completed 31 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 areas such as unlawful disposal of waste at landfills, litter and illegal dumping, proper handling and disposal of asbestos waste, inspection of waste transport vehicles, and the management of liquid waste.

The City and Country Environment Restoration Program announced in November 2005, includes a major crackdown on illegal dumping through stepped up and targeted campaigns over the next five years.

Providing a framework for decisions about collection and reprocessing

DECC will continue to provide guidance to NSW Councils and other waste managers about emerging issues in order to assist their decisions about provision of recycling services and selection of technologies.

DECC has already provided guidance about the importance of maintaining separate recycling collections, use of alternate technologies and the duration of landfill contracts. It has advised that landfilling contracts should not be made for longer than five years since these may restrict opportunities for emerging alternative waste treatment in the near to medium term, reducing our ability to achieve our waste reduction targets and resulting in a poor environmental outcome for the community as a whole.

Whilst Alternative Waste Technologies have the potential to recover significant value from the mixed municipal waste stream this should not detract from source separation and kerbside recovery. Such technologies should be regarded as a complement to, rather than a substitute for, the separate collection of recyclable materials. Separation of materials at the point of generation yields a stream of clean and largely uncontaminated material which maximises the options for recovery and reprocessing. This includes dry recyclables as well as organics.

There is no single solution or configuration for collection services and reprocessing and there are many variables that will affect the type and frequency of the system and service adopted. Factors include 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.

To ensure that resource recovery delivers appropriate environmental outcomes, DECC also encourages recovery of materials from the waste stream that can deliver quality outputs that are fit for purpose, marketable and do not cause harmful environmental impacts. The DECC does not support, prefer or promote any specific technologies or processing systems for particular waste streams.

Reducing commercial and industrial waste

The commercial and industrial waste stream continues to be not only the biggest waste stream in Sydney but also the hardest stream to tackle as it has so many players of different sizes and across different sectors, with diverse and ad hoc recycling systems.

Commercial and industrial waste comes from a wide range of sectors including businesses (small and large), commerce and retail, service providers of all types including hospitality and government agencies, substantial land managers and sites with high public visitation. The varying nature and focus of these generators increases the difficulty in framing broad scale programs.

The range of DECC programs tackling commercial and industrial waste address the issue from different intervention points. Some projects work with individual or groups of businesses to support changes in practice at the point of generation (either reducing waste or producing cleaner, more useable streams). Others work at the system level, at points of collection or reprocessing, to increase the recovery of useable materials. Some projects work to provide guidance for generators of waste and reprocessors to ensure the best quality feedstock and recycled materials. Others focus on potential users of recycled content materials to build demand by demonstrating performance and cost competitiveness.

<u>Programs with business</u>

Focus for action

- *Sustainability Advantage partnerships with geographic and sectoral clusters of industry to tackle waste and other sustainability issues*
- *Sustainability Compacts with sector leaders to change their own practices as well as their supply chains*
- *Joint compliance and cleaner production work with licensed companies*
- *Information and training for key manufacturing sectors in partnership with local Councils*

The majority of DECC-run programs involving business and other organisations have focussed on specific sectors or wastes. This approach needs to continue. In particular, since the late 1990s cleaner production programs have successfully engaged many companies and delivered financial and environmental benefits.

Having made gains from improving waste related processes, many companies are now seeking further support and opportunity to tackle a wider range of environmental issues associated with sustainability. This growing commitment to sustainability by corporate Australia is expected to continue over the coming years.

While profit drivers will continue to be a strong motivator, an increasing number of companies are deciding that their long-term viability depends heavily on superior social and environmental performance. These companies will look to minimise risk and 'add value' by achieving savings from the more efficient use of resources and reduced levels of waste; developing innovative 'green' products and becoming a supplier of choice; building reputation; and increasing staff productivity by providing a clean, healthy and environmentally responsible workplace.

There is an opportunity to leverage this growing business interest in sustainability to translate it into practical and large-scale environmental action. This will require proactive engagement with business on a sectoral, cluster or individual basis. Partnership programs will need to provide business with the knowledge, skills and motivation to significantly improve the environmental performance of their own operations and supply chain, and to be advocates for sector improvement.

The DECC Business Programs will tap into this opportunity. Programs will have a strong waste focus but they will often be delivered through broader sustainability projects, focussing on 'business value' such as reduced costs, improved reputation and productivity increases, as well as environmental gains. This approach suits the preference of larger companies in particular who want integrated rather than single issue approaches.

Between 2006 and 2009, DECC Business Programs will be delivered through three mechanisms:

1. Business Partnerships, including NSW Sustainability Compacts;
2. Cleaner Production for Licensed Premises; and
3. Education for Compliance and beyond.

The Business Partnerships Program will focus on partnering with medium to large companies as this offers outstanding opportunities to address waste issues through supply chain links. The lead program in this area will be *Sustainability Advantage*, which will bring together companies in industry sector and geographic clusters. A management diagnostic will assist firms to identify and prioritise waste and other environmental projects. Companies will work in a minimum of three of the following areas:

- *Vision, Commitment and Planning* – a business vision that includes environmental commitment (policy and strategy) and planning to drive and embed environmental improvement;
- *Environmental Risk and Responsibility* – risk management, self-assessment, education and training and on-ground action to help ensure compliance with environmental law;
- *Resource Efficiency (cleaner production)* – action to reduce resource use and lower the volume and toxicity of waste and emissions, while increasing profits (includes facilities management);
- *Supply Chain Management* – active collaboration within the supply chain to improve environmental performance;
- *Stakeholder and Staff Engagement* – staff involvement in sustainability planning, direct action at work and volunteering (includes work with external stakeholders and 'neighbour of choice' initiatives); and
- *Climate Change* – identification of both risks and opportunities.

Cleaner production work will continue but this will focus on licensed premises as part of the regulatory relationship.

Sustainability Advantage will work with a broad cross-section of industry, but will place an emphasis on developing partnerships with priority sectors that operate in metropolitan and regional areas. This will include, but not be limited to:

- Commercial Property – existing partnerships will be expanded with major property owners and managers in Sydney to improve performance and reporting against waste and recycling benchmarks and to address waste from daily operations (paper/cardboard, packaging and food) and waste being generated through retrofit and refurbishment.
- Food Processing – collaboration with major food companies on projects that include the recycling of glass and plastic packaging (e.g., polypropylene and polystyrene containers) from product returned to the manufacturer.
- Building Products – collaboration with leaders in the manufacturing of plasterboard, bricks and masonry, floor coverings, concrete and other building products to improve waste outcomes in operations, products and the supply chain.
- Health and Aged Care – initiatives to reduce waste in the health services and aged care sector, delivered in partnership with public and private facilities.
- Registered Clubs – a partnership with ClubsNSW will support efforts by the State's 1,400 registered Clubs to address waste through recycling and reuse initiatives, and purchasing and refurbishment initiatives. A focus will be placed on: organic waste separation and utilisation; recycling of glass, paper and cardboard; and reducing the environmental impacts of building works.

The NSW Sustainability Compacts will also support waste avoidance and resource recovery. These are voluntary agreements with a small number of sector leaders. To date, Compacts have been agreed with Hewlett-Packard Australia (HP), Insurance Australia Group (IAG) and Sensis. Waste issues will be addressed through improvements in four key areas:

- sustainability leadership (e.g., commitment and planning, advocacy and reporting)
- sustainable products and services (redesign, development of innovative new 'environmentally preferable' products and services, and product stewardship)
- efficient production and service delivery (resource, waste and other efficiencies) and
- environmental responsibility (all aspects of the business and, where appropriate, its suppliers, are compliant with environmental legislation).

Through the NSW Sustainability Compacts, support has been provided to IAG to develop a Risk Radar to assist 50,000 agricultural businesses consider environmental and OH & S issues; implement a trial to reuse and recycle damaged home contents; and investigate energy generation at IAG sites. Support has been provided to assist Sensis develop an 'opt-out' option for delivery of print directories and HP has focused on working within the industry to establish a national take-back scheme for computer hardware. As well, DEC and HP will collaborate on 'environmentally preferable' purchasing of information and communication technology equipment for business and government and best practice for the reuse/recycling of printer cartridges.

In addition to *Sustainability Advantage* and the NSW Compacts, resource efficiency (cleaner production) work will also be undertaken in collaboration with premises licensed by the DECC as part of the regulatory relationship.

The Education for Compliance program will deliver projects that help provide the awareness, knowledge and skills that business requires to meet its environmental responsibilities under the *Protection of the Environment Operations Act 1997* and support for the objectives of the *Waste Avoidance and Resource Recovery Act 2001*. The focus will be on changing practices of small and medium businesses through education and training; building the capacity of local government as an industry regulator, educator and operator; and strategic input to formal vocational, education and training initiatives.

While work will be conducted with a range of sectors, an emphasis will be placed on supporting waste initiatives in priority industry groups such as printers, automotive repairers, smash repairers, manufacturers of wood and furniture products, service stations, and boating marina facilities.

Resource recovery and system improvement programs

Focus for action

- *Better market support and system changes through priority materials flow modelling*
- *Partnerships with commercial and industrial businesses, including waste transporters, to improve source separation and recyclables sorting systems*
- *Business planning and financial modelling tool to assist Councils to expand recycling services to small and medium businesses*
- *Research to solve system and contamination problems at key points*
- *New audit to measure composition of commercial and industrial waste being disposed of*
- *Focussed funding to support new market development for priority materials such as glass fines*

The diverse nature of businesses generating commercial and industrial wastes has led to underdeveloped and ad hoc systems for resource recovery. A great deal more work is needed to identify strategic intervention points along the lifecycle of key material streams. These are the points at which there is the greatest opportunity to achieve changes to systems or relationships that will ultimately result in substantially increased tonnages for recycling.

Establishment of innovative collection systems and benchmarking of existing systems to improve performance is needed across a range of sectors. Consistent with data from recent C&I landfill audits the main materials focus will be paper, glass, plastics and timber.

To gain a detailed understanding of the market an annual update of Paper Materials Flows data for NSW has been developed. This is providing accurate data on amounts and flows of packaging paper, office paper, newsprint and tissue paper and will inform future projects for increased paper recovery in NSW.

DECC programs will also concentrate on partnerships with commercial and industrial businesses, including waste transporters, to encourage much higher participation in source separation of materials for recycling. The waste transport industry is a key

part of this focus because it represents a potentially efficient point for the development of improved systems for waste separation and aggregation.

Links will also be made through the DECC local government C&I program. A Business Planning Guideline and Financial Modelling Tool is being prepared to equip Councils with the necessary knowledge and planning tools to develop a sound business case for the provision of recycling services to small and medium businesses. This is currently being piloted with three Councils. A Market Research Guide which assists Councils gather information on their local market for recyclables is also being tested.

Research has also been done to learn more about what might motivate 330,000 small to medium enterprises (SMEs) in NSW to recycle more. Past social research has indicated that broad attitudes within industry to environmental protection are reasonably positive. The information from this new research is helping to develop the strategies for broad scale engagement at the business level and for maintaining participation.

Industry specified standards can assist market development. This approach has already been successful for construction and demolition materials. Recycled glass has been targeted for an industry specification. A number of other partnership approaches are supporting market development for glass fines, for example as embedment for water and sewer mains pipes and assessing the feasibility of using fines as the drainage leachate layer in new landfill cells.

The ongoing increases in the Waste and Environment Levy will also provide a significant opportunity for those involved in the collection and aggregation of commercial and industrial waste to improve recovery outcomes and to take advantage of economies of scale afforded to their operations.

New research is planned to gain a better understanding of how waste from commercial and industrial businesses can be drawn into the recycling streams. In particular, work on ways to improve recovery of specific materials will be undertaken as follows:

- paper – explore improvements to existing collection and treatment methodologies to ensure markets for collected materials are retained and enhanced
- plastics – explore ways to assist industries to increase the segregation and recycling of the various plastic materials
- timber - focus on improving systems for increased recovery, particularly the identification of non-recyclable timbers including some treated timbers so they can be easily excluded from recyclable materials and
- glass fines - identify additional appropriate reuse options for glass fines and develop a ‘greenspec’ for this product, particularly sourced from the MRF operations.

Government programs

Focus for action

- *Streamlined electronic reporting system for agencies including calculator to convert waste contributions to greenhouse, energy and water savings*
- *Increased use of government contracts to support recycled content products and reward responsible supplier recycling services*
- *Transferring good government practices in waste reduction and purchasing to other sectors*

Government agencies will remain an important focus given their purchasing power and the community expectation that governments will show leadership in tackling environmental and sustainability issues.

Government agencies will need to continue to build their capacity for waste reduction and their willingness to purchase environmentally friendly products, including products with recycled content. The requirements of the NSW Waste Reduction and Purchasing Policy (WRAPP) which requires plans and regular reporting by agencies will continue to drive this outcome. Work will focus on better integrating waste and other sustainability actions into the core business of agencies; supporting agencies to streamline reporting and data collection through better systems; and supporting purchasing decision-making through accessible information on performance of 'green' products, particularly recycled content products. There are also ongoing opportunities for the Department of Commerce to incorporate environmental considerations into key government contracts.

DECC programs will continue to provide substantial support to government agencies. The second whole-of-Government WRAPP report was produced in 2006, and the considerable amount of data collected as part of the past three reporting periods has provided the basis for a thorough review of WRAPP. The review will consider the range of materials currently covered and agencies' abilities to contribute to other emerging priorities such as EPR and related environmental issues. These include the NSW Greenhouse Plan and NSW commitments as a signatory to the National Packaging Covenant.

The collaborative work with the Department of Energy, Utilities and Services and the Australian Greenhouse Office to integrate electronic reporting of agency waste performance data into an existing system used for reporting energy use will be completed in 2007. Support for purchase of recycled content products will be maintained and a greater emphasis will be placed on transferring the learning and successes from government to other sectors. There are also growing opportunities to use government purchasing to further drive product stewardship initiatives and DECC will further explore this with the Department of Commerce.

Agencies were due to report again in August 2007 for the period 2005-2007. Any changes flowing from the review will be introduced for the August 2009 reporting period to enable departments to collect any additional data needed.

Reducing municipal waste

Focus for action

- *Performance payments for Councils that improve their waste and recycling practices and results.*
- *Continued support to Councils for sustainable purchasing practices*
- *Tools for Councils to support decisions on systems and technologies, plus education, resources and training*
- *More easy to use standard contracts that reflect best practice performance*
- *Assistance to improve waste and recycling practices in multi unit dwellings*

Significant gains have been made in recovering municipal waste for recycling but this will need continued support. Local government will remain a critical focus. Councils continue to play a key role in managing municipal waste and have the potential to influence other sectors, for example, through community education, by promoting

re-use in households through home composting, business recycling (through potential expansion of recycling services) and business and construction activities (through planning approvals and licensing).

Councils also represent a powerful purchasing block with the ability to support and influence the provision of recycled content products as well as other environmental credentials. Many also practice re-use of their own Council wastes through, for example, mulching of parks and gardens waste and re-use of concrete and other construction materials generated in their operations.

Tools for Local Government to support decision-making and good practice advice will need to be maintained and updated in light of new technologies, performance results, new or changing economic and environmental cost-benefit research, and changing community perceptions and priorities. Programs, tools and training to support Councils in their roles as regulators, operators and educators also need to be maintained.

Opportunities to expand and rationalise existing council infrastructure and services, such as waste collection in the commercial and industrial small to medium enterprise areas will continue to be supported, as well as groups of councils working collaboratively to introduce regionally based resource recovery technologies.

A new opportunity over the term of *Waste Strategy 2007* for both the commercial and municipal waste streams is food waste recovery. Research will be needed and a framework will be developed in collaboration with all key players.

A new key influencer is the growing trend for people to move to units and apartments. This presents new challenges for education, planning and recycling systems to ensure that recycling performance is maintained and improved. Best practice guidelines for both building construction and recovery systems in units and apartments will be needed.

DECC programs will focus on assisting, supporting and working with NSW councils to further increase the efficiency and effectiveness of the resource recovery services they provide, the regulatory instruments they administer, and the functional frameworks in which they operate.

Programs will be delivered through the following streams:

- Improved Practice Resource Recovery
- Local Government Sustainable Purchasing
- Council Networks and Systems Development; and
- Litter and Illegal Dumping (see next section).

The Improved Practice Resource Recovery Program will focus on providing guidance and standard contracts for resource recovery and residual waste processing. Other projects include preferred resource recovery practices for multi-unit dwellings, guidance on design of storage facilities, a composition audit of the clean-up hard waste stream, and finalisation of the business case and development of market research tools to improve resource recovery from small to medium businesses.

Improvements to waste-wise purchasing will be delivered by expanding the Local Government Buy Recycled Alliance into a Local Government Sustainable Purchasing Alliance. This expanded program will work more closely with ECO-Buy (Victoria), to build on their experience.

Implementation of best practice recycling and resource recovery by Councils in the Sydney, Hunter, Central Coast and Illawarra areas will be supported over the next 5 years through Waste Performance Payments as part of the Environmental Trust City and Country Program. Councils will qualify for payments by meeting annual performance standards for recycling and resource recovery. Standards will include the provision of data, such as waste and recycling quantities, composition, costs and contamination rates. They will also include the adoption of good practice waste and recycling service systems as identified and published by DECC. The performance standards will be developed in consultation with the Local Government and Shires Association.

Reducing litter and illegal dumping

Focus for action

- *Continued support to Regional Illegal Dumping Squads to deliver stronger compliance and enforcement programs*
- *Support for Councils to tackle illegal dumping in multi unit dwellings*

Illegal dumping will continue to challenge councils located around the urban fringes of Western Sydney and the South Coast/ Southern Highland areas and continued efforts will be needed to cover both litter and illegal dumping. As part of the Government's recent City and Country Environmental Restoration Program initiative, an additional $18 million has been allocated over the next five years to enable DECC to provide a stronger waste compliance and enforcement program including action to tackle illegal dumping. Ongoing support will be also be needed for the litter and anti dumping initiatives of the eight regional waste groups outside the Sydney, Hunter, Central Coast and Illawarra regions (see next section).

The Litter and Illegal Dumping Program will also include support for the strategic action plan and priority programs of the Litter and Illegal Dumping Action Alliance. The Alliance has developed a three-year plan, which identifies priority actions to tackle litter and illegal dumping in NSW. The focus over the next three years will be on increasing the level of awareness of the social, environmental and economic impacts of litter and illegal dumping, as well as supporting enforcement officer education. The illegal dumping program also includes the implementation of the Multi Unit Illegal Dumping Prevention Campaign Kit, which involves officer training and a grants program to guide councils implementing the program.

Supporting waste reduction in rural and regional NSW

Focus for action

- *Continued program funding for 8 voluntary regional waste groups covering 90% of rural and regional NSW*

The eight Voluntary Regional Waste Groups, which cover 90% of rural and regional NSW, have undertaken three-year regional planning for 2006-09 in consultation with their member councils. Programs have been designed to tackle the regions' waste and resource recovery issues and to contribute to the State's waste and resource recovery targets. These programs tackle waste across each of the three key waste streams – municipal, commercial and industrial and construction.

DECC will continue to provide funding support for key programs identified in the regional plans. These build on the considerable successes of the past few years and include:

- regional consolidation of waste facilities and services to improve environmental outcomes
- an increased focus on resource recovery in the commercial and industrial sectors
- integrated management planning for organics processing and reuse within the regions
- waste reduction and management planning with local businesses and
- improved data that can be used to encourage the establishment of reprocessing facilities and development of local markets.

Reducing construction and demolition waste

Focus for action

- *Support to develop systems to identify non recyclable timbers from readily re-useable timbers to increase recovery of wood waste*
- *More 'greenspecs' for major materials to increase re-use*
- *Further support for Councils to implement Waste Not DCP*
- *Guidance to ensure removal of asbestos from other useable construction materials*

Recycling of material from the construction and demolition (C&D) waste stream has been very successful over recent years. This is because the materials involved are relatively easily separated at source and also due to their weight and volume. They have also responded best to the economic driver of the waste levy because avoiding disposal represents huge cost savings.

Although waste has been reduced significantly in this stream, recent audits indicate that substantial quantities of some materials are still being disposed of. As noted previously, a driving factor behind the reduction in construction waste recycling is contamination of other demolition wastes with asbestos. Coupled with unresolved technical issues such as the ability to separate some non-recyclable timber from the rest of the timber stream (see below), there are substantial challenges facing this sector over the next few years.

On the positive side, the initial results of the C&D Audit have allowed operators to better understand the nature, composition and quantity of specific materials being presented at landfills. This is resulting in the recovery of more materials, through the use of additional or different processing systems or technology. This is particularly so for materials presented in a finer fraction of the waste stream and previously not recycled. There has been a significant increase in investment in reprocessing infrastructure over the past 12 months. Several new C&D recovery facilities are planned or under construction. These will significantly add to C&D reprocessing capacity.

Markets for many recycled products are well established, mainly in metropolitan areas, but more are needed, particularly for materials such as glass fines. Markets also need to be expanded in some regional and rural areas. This may require the establishment of additional recycling processes in some areas.

Timber is a major component of construction and demolition waste, but the lack of a system to readily identify and extract non recyclable timbers such as some treated timbers from readily reusable timber is a major impediment to the large scale recycling or re-use of used timber. A collaborative effort between industry and government will be needed to address this and other barriers to increased recovery

of wood waste. Treated timber has been identified as a priority waste under the NSW Extended Producer Responsibility Priority Statement.

To provide some surety for the re-use of construction materials, 'greenspecs' have been developed for some products through collaborative industry and government projects. More 'greenspecs' are needed to cover all major materials recovered through this sector, including fill materials and timber.

A number of councils have already implemented a development control plan called the Waste Not DCP to further improve source separation of waste material from the construction and demolition industry. Following the planning reforms of 2005 and work with the Department of Planning, a consultation process will be undertaken to revise the current Waste Not DCP. Once finalised, the new DCP will be accompanied by training and will inform an evaluation of related DECC programs for 2007–08 and 2008–09. The DCP has the potential to drive increased recycling of demolition and construction waste, as well as improved provision and on-going management of suitable waste and resource recovery facilities.

Other specific waste streams

Focus for action

- *Continued market development programs to encourage use of recycled organics by Councils, Catchment Management Authorities, Government Agencies, mines, agriculture and sports and recreation facilities.*
- *New market study to identify current uses and opportunities for recycled organics*
- *Continued scientific trials to prove the benefits of recycled organics in a range of uses*
- *Development of strategies to tackle municipal and commercial food waste*
- *Continued funding of Household Chemical Cleanup program*
- *Work with government departments to identify potential major users of VENM*

Organics

The most significant problem for this secondary resource stream is that the growth in markets (~14% p.a.) has not increased at the same rate as diversion from landfill (~19% p.a. average over the five years before the drought). The recent drought has also reduced the amount of material presented for processing, thereby reducing the revenue stream for processors. It has also impacted severely on the nursery and landscaping industries, which are major markets for recycled organics.

While increases to the Waste and Environment Levy, announced in 2006, will further drive the diversion of organics from landfill, continuing investment in market development is necessary. A framework developed in collaboration with all key players is also needed to support and create more impetus for the recycling of food waste from both the commercial and municipal sectors. On the supply side, work is needed to improve recycling systems, particularly by reducing contamination rates.

To date, DEC and industry programs have been very successful in increasing markets for recycled organics. The market has more than doubled in six years (from 370,000 m^3 in 1998 to 847,000 m^3 in 2004), but accelerated work is needed to create and grow markets in order to close the increasing gap between supply of organics for recycling and market demand.

DECC will continue its Organics Market Development Program which will include projects such as: Cost Benefit in Agriculture; Catchment Rehabilitation trials; Parks and Gardens trials; Golf Courses and Turf applications; and Erosion Control on Highway Construction Projects. The program will also provide continued support for implementation of the Compost Australia Industry Roadmap.

DECC will also undertake programs to explore growing opportunities for more integrated systems to deal with organic materials in regional areas.

A new medium term goal of the organics program is to assist consideration by Councils and waste industry collectors of options and opportunities to collect food waste for recycling. DECC will discuss issues relating to food waste recovery with key industry organisations, local government and State government agencies. DECC will also provide information to assist decision making through publication of a review of collection and recovery schemes currently operating in Australia and overseas and publication of a triple bottom line assessment of the benefits and costs of adding food waste to household recycling schemes.

Household chemical wastes

The community has strongly supported opportunities to safely dispose of unwanted household chemicals and the current DECC program will continue in the medium term. However, an increased effort will be made to ensure that producers of major products and materials collected under the scheme provide additional support to the program.

At present, paints, oils and lead acid batteries comprise a substantial proportion (79%) of the materials collected, but these sectors currently make no physical or financial contribution to the running of the scheme. These sectors have been put on notice that this needs to change. The Household Chemical Collection scheme will also continue to be streamlined to ensure that the geographic coverage of collections is optimised and that the scheme delivers the best value for money. The DECC program for 2006–07 has provided collections for a total of 51 Councils in the Sydney Metropolitan Area and the Hunter, Central Coast and Illawarra regions. It continues to provide a hotline and website information on the handling and disposal of household chemicals.

VENM

Virgin Excavated Natural Materials (VENM) is usually generated through various types of excavation and construction works. The material is extremely useful and whilst there is some allowance for landfill operators to use limited quantities of VENM for operational purposes in managing the landfill (e.g., for roads and cell construction), VENM that is disposed of to landfill is subject to the waste disposal levy.

The new electronic waste data system (see section 1.1) has enabled DECC for the first time to specifically identify and aggregate total amounts of VENM being disposed of to landfill. The majority of this material is generated in the Sydney region and the total quantity being disposed is growing.

VENM represents a substantial opportunity for diversion and re-use. Future increases in the waste levy will provide a strong incentive to generators of VENM to identify projects that can re-use this material. DECC will also support these efforts by working with various government departments, including the Department of Planning to identify potential users such as new subdivisions and land releases and major infrastructure that may be able to use substantial quantities.

Product stewardship/extended producer responsibility programs

Focus for action

- *Work to deliver national systems for agreed wastes of concern*
- *Support and continued monitoring of progress of the National Packaging Covenant and enforcement action against non signatories*
- *Continued work with sectors identified as 'wastes of concern' in the NSW EPR Priority Statements*
- *Improved criteria and processes for identifying priority wastes*

Product stewardship will remain a major program focus in the coming years, either through a mix of voluntary, co-regulatory or mandated approaches. It is a key driver worldwide to ensure that producers take physical or financial responsibility for the environmental impacts of their products throughout the products' life cycle.

Given the nature of the demographics, markets and industry structure in Australia, programs will continue to give priority to national approaches based on collaboration and cooperation between governments and industry sectors. There will be increased levels of analysis of the relative costs and benefits of the various options for action (from voluntary through to fully mandated) to ensure that the approaches that are implemented deliver the best environmental, economic and social benefits. A continuing focus will also be needed on the provision of effective enforcement of regulatory safety nets or other mechanisms to ensure that companies participating voluntarily are not disadvantaged in the market place.

DECC will continue to support national processes aimed at achieving product stewardship outcomes for TVs, computers, tyres, plastic bags, mobile phones and packaging. Through the DECC, NSW is leading the EPHC work relating to electrical products. Work includes the development of regulatory impact statements and economic modelling relating to individual waste streams and the development of a generic National Environment Protection Measure (NEPM) as a co-regulatory safety net to underpin voluntary product stewardship schemes as they are developed by product sectors.

DECC will continue to support the EPR Expert Reference Group (ERG) appointed by the Minister to evaluate the performance of the 'wastes of concern' (currently 17) identified in annual EPR Priority Statements. There will also be a review of the current selection and evaluation criteria for wastes identified in annual statements, continued meetings with sectors, support for various sector initiatives, data collection, ongoing research into international models and experience and modelling of particular schemes proposed by industry.

Better knowledge and data

<u>Waste intelligence</u>

Focus for action

- *Improved electronic data system for reporting and analysing recycling data*
- *Improved process for annual reprocessor surveys*
- *New commercial and construction waste disposal audits*
- *Improved data and information on products identified as wastes of concern*

Waste intelligence and analysis programs will remain a key requirement to support waste reduction and resource recovery efforts in NSW. While the quality of reported waste data is improving, there are still substantial challenges relating to obtaining accurate data and reporting on recycling in some sectors.

Data on amounts of waste disposed of and recycled provides the basis for reporting and evaluating the performance of individual programs, sectors and waste streams as well as progress against the goals and targets in *Waste Strategy 2007*. The work involved in gathering this data includes the development and implementation of appropriate management systems for data, including the new Waste Data system introduced in 2005–06, reviewing measurement and collection methodologies and streamlining systems to minimise the work required from organisations providing the data.

Over the next three years, there will be further building on recent improvements to the range, representativeness and quality of data collected on waste related issues. This effort will be result in increased confidence in future data sets.

Annual data sets such as reprocessor data, council NEPM data, brand owner surveys, data required for annual reporting against the National Packaging Covenant and other product stewardship schemes and statewide litter counts will be maintained. Key data sets such as C&I and C&D landfill audits will be repeated at regular intervals.

New data collection and monitoring related to extended producer responsibility performance will become increasingly important. This will enable better measurement of the results and allow governments to evaluate programs and have confidence in the data used as the basis for negotiated performance outcomes and targets. Data required to monitor and measure product stewardship in many sectors is not readily available.

The DECC waste intelligence team will continue to refine the new electronic waste reporting database and develop improved ways for organisations to lodge the wide range of annual data collected to fulfil various reporting obligations. In response to concerns raised by users, a review will also be undertaken of existing waste audit methodologies, starting with the municipal and commercial methodologies. Major landfill audits are scheduled for 2007–08 (C&I) and 2008–09 (C&D).

Social research

Social research is another key source of information that helps build an understanding of the social dimension of environmental sustainability, particularly in relation to the barriers and opportunities for behaviour change.

DECC will continue to publish and disseminate its statewide triennial research survey, *Who Cares About the Environment?* The 2006 survey was released in late November[41]. As well as undertaking secondary analysis and providing tailored analysis on specific waste and resource recovery issues for stakeholders, DECC will continue to promote the use of social research to improve waste education programs by developing a guide to using research and conducting workshops and training.

[41] *Who Cares About the Environment (DEC 2006)*

Education

Focus for action

- *Helping all sectors understand the links between waste and other environmental issues and helping people to make positive changes in their lives*
- *Continue to support waste and sustainability educators throughout the community to promote positive environmental actions through training, resources, capacity building, research and partnerships.*
- *Continued focussed support for initiatives by ethnic communities, aboriginal communities and young people to promote action on waste and sustainability*

DECC's community education programs will continue to contribute to Government priority outcomes in the areas of waste and sustainable living by strengthening delivery across the system of environmental education, addressing specific waste education gaps and needs, and supporting integration of education in DECC waste programs as well as other parts of DECC.

The medium term strategy for education is to continue to build the capacity of the system of sustainability education and to conduct education programs on priority waste issues. Specific objectives of waste-related education programs between 2006 and 2009 will be to:

- raise the profile of education and its role in waste minimisation and management in industry, government and the broad community
- identify and promote leading practice education, including improved program design, measurement of outcomes and linking education on waste with other sustainability issues
- ensure continuity of waste education messages and
- promote knowledge and resource sharing by waste educators.

There will be a focus on improving understanding of the key factors that influence waste related knowledge and behaviour, and then developing program approaches that deliver the best results for each particular audience. These could include partnerships, education and training, and sustainability education behaviour change programs. Some of this work will include capacity building of DECC officers who have waste or material specific knowledge but are not familiar with the range of available educational tools.

Programs will promote improved waste education frameworks and practices through the development of guidelines and case studies, the provision of training, partnerships with local councils to deliver high quality sustainable living community education programs, and the funding of evidence-based council and community projects that rigorously research and report on behaviour-change outcomes.

Work with ethnic communities to deliver targeted sustainable living workshops and field trips will continue, as will work with councils and other organizations to build capacity to undertake ethnic communities education projects. This work will include the development of a Working with Ethnic Communities guideline, as well as associated training and network development.

Work will continue with Aboriginal communities to develop and pilot programs that address waste, litter and integrated sustainability outcomes.

The engagement of young people (those aged between 15 and 25) with environmental issues will be a particular focus and a forum is being established for environmental youth citizenship and leadership.

Waste avoidance

Strategies that encourage waste avoidance are generally part of integrated programs tackling broad waste related or sustainability issues. DECC programs that have a strong waste avoidance component include the business partnership programs that focus specifically on cleaner production or on tackling a range of sustainability issues. The Sustainability Compacts that have been negotiated with sector leaders such as Insurance Australia Group (IAG), Sensis and Hewlett Packard include waste avoidance goals and actions. For example, in its Compact with the NSW Government, Hewlett Packard has undertaken to deliver incremental landfill diversion targets at its NSW plants and facilities.

Other programs include work with sectors to implement product stewardship initiatives. Work with all sectors includes discussion about ways to improve the design of products to reduce the amount of resources used and to reduce waste and encourage recovery at end of life. A specific example is the requirement that was built into reporting requirements for National Packaging Covenant company signatories to provide details about how they have reduced use of feedstock inputs (including energy, water and raw materials).

DECC education programs such as the successful ethnic communities program and work to support School Environmental Management Plans also have a strong avoidance focus. The Government's WRAPP reporting also includes a requirement to report changes in total paper consumption and other efforts to avoid waste.

4.5 International and national targets

The *Waste Avoidance and Resource Recovery Act 2001* (sub-section 12(2)(a)) requires DECC to benchmark its waste strategy to international best practice. The DECC has reviewed targets adopted by European countries, the UK, the US, and Canada. The findings have been summarised in **Appendix 3**.

The review demonstrated that there continues to be wide variations in targets and approaches by countries or individual states, provinces or regions throughout the world, making it difficult to identify any particular set of targets or approaches as 'international best practice'. Nevertheless, the targets in *Waste Strategy 2007* for the increased recovery and recycling of municipal, C&I and C&D wastes to 66%, 63% and 76% respectively by 2014 are in line with the targets and aspirations in many of the countries that were surveyed.

For example:

- Canada – 50% landfill diversion target for all three waste streams;
- Denmark – 65% recycling target for C&I wastes and 64% for C&D wastes;
- EU – 65% landfill diversion target for municipal wastes;
- New Zealand – 60% diversion of municipal garden wastes from landfill; 50% recycling target for C&D wastes;
- UK – 15% landfill diversion target for C&I wastes; and 65% for municipal wastes; and
- US – 35% recycling target for municipal solid wastes.

In producing *Waste Strategy 2007*, DECC also reviewed targets, where they existed, of other Australian jurisdictions for the recovery and reuse of waste material from the municipal, C&I and C&D waste streams. The following table provides a comparison of NSW targets against those set by other States and Territories:

Comparison of NSW targets against targets set by other Australian jurisdictions

WASTE STREAM	NSW	VIC	SA	WA	ACT
Municipal	66% recovery by 2014	65% recovery by 2014	75% recovery (including food waste) by 2010	Recovery targets by 2015: Inert (mainly C&D) = 100% Organics (household and commercial) = 85% Recyclables (kerbside) = 100%	Zero waste by 2010
C&I	63% recovery by 2014	80% recovery by 2014	30% increase in recovery by 2010 (over 2004 tonnage)		
C&D	76% recovery by 2014	80% recovery by 2014	50% increase in recovery by 2010 (over 2004 tonnage)		

4.6 Monitoring and reporting future progress

DECC will publish progress reports on *Waste Strategy 2007* in accordance with the *Waste Avoidance and Resource Recovery Act 2001*. The next progress report is due in 2008. DECC will also continue to periodically review the NSW Waste Strategy as required under the Act.

Appendix 1 – Recent studies and research

Social research

- *New South Wales State of the Environment 2006*, DEC, December 2006
- *Who Cares about the Environment in 2006: A survey of NSW people's environmental knowledge, attitudes and behaviour*, DEC, November 2006
- *Educating the Community About Litter: Changing knowledge, attitudes and behaviour 2000 to 2003*, DEC, December 2005
- *Wasteful Consumption in Australia*, Australia Institute, March 2005
- *Illegal Dumping in NSW - Final Report*, DEC, February 2005 (unpublished)
- *NSW Litter Report 2004*, DEC, December 2004
- *The Environment and Ethnic Communities in 2004*, DEC, October 2004
- *An assessment of attitudes and behaviour amongst multi unit dwelling residents in relation to illegal dumping*, DEC, May 2004
- *Consumer Demand for Environmental Packaging: A report from a survey of NSW residents regarding the purchasing, use and disposal of packaging, Report prepared by the Taverner Research Group for Jurisdictional Recycling Group, January 2004*
- *Evaluation of the EPA's 'Tosser Campaign*, DEC, July 2003 (unpublished)
- *Optimising the Tosser 2 Campaign: Market and Consumer Insights,* DEC, March 2003 (unpublished)

Systems research (performance and benefits)

- Passive drainage and biofiltration of landfill gas using recycled materials. Report prepared by UNSW and GHD Pty Ltd, DEC, December 2006.
- *WRAPP Progress Report 2006*, DEC, September 2006
- *Cost/benefit of using recycled organics in council parks and gardens operations in NSW*. 2nd Edition, DEC, June 2006.
- *Recycled organics in mine site rehabilitation - review of the scientific literature*. Report prepared by the NSW Department of Primary Industries, DEC, June 2006.
- *Assessment of Garden Organics Collection Systems*, DEC, May 2006
- *Recycled organics in catchment management – final report*. Report prepared by the NSW Department of Primary Industries, DEC, September 2005
- *Recycled organics - on farm salinity trials*. Report prepared by EA Systems Pty Ltd, DEC, August 2005
- *Developing recycled organic products for use in viticulture*. Report prepared by Ecoresearch Pty Ltd, DEC, August 2005
- *Recycled organics in catchment management - review of the scientific literature*. Report prepared by the NSW Department of Primary Industries, DEC, August 2005
- *Benefits of Recycling,* DEC, May 2005
- *WRAPP Progress Report 2004*, DEC May 2005

- *Household Electrical and Electronic Waste Benchmark Survey*. Report prepared for DEC by Ipsos, March 2005.
- *NSW reprocessing industries survey 2003–04*, DEC, 2005
- *Recycle IT! Computer Collection Pilot Report*. DEC and the Australian Information Industry Association, October 2004
- *City to Soil*, DEC, July 2004
- *Analysis of markets for recycled organic products - report*. Report prepared by GHD Pty Ltd, DEC, June 2004
- *Assessment of domestic waste and recycling systems,* DEC, March 2004
- *Persistent herbicides risk management program*. Report prepared by the Recycled Organics Unit, UNSW, DEC, February 2004
- *Hunter Municipal Solid Waste Audit Report*, DEC, 2004 (unpublished)
- *Study on local government management costs for garden organics*. Report prepared by Anne Prince Consulting, DEC, December 2003
- *Life cycle inventory and life cycle assessment for windrow composting systems.* Report prepared by the Recycled Organics Unit, UNSW, DEC, October 2003
- *Electrical and Electronic Products - Infrastructure Facilitation*. Report prepared by Nolan-ITU for DEC and the Department of Environment and Heritage, September 2003.

Informational, guides, tools

- *NSW Government Waste Reduction and Purchasing Policy: Guidelines to assist reporting*, DEC, 4th Edition, January 2007
- *Preferred resource recovery practices by local councils*, DEC, March 2006
- *Learning for Sustainability 2007-2010*, DEC, October 2006
- *Getting more from our recycling systems: Good practice performance measures for kerbside recycling systems*, DEC, 2005
- *Getting more from our resource recovery systems: Model waste and recycling collection contract*, DEC, 2005
- *Better Practice Guide for Public Place Recycling*, DEC, May 2005
- *Report on the Mattress Industry of NSW*, DEC, 2004 (unpublished)
- *Waste and resource recovery – Service development timelines*, Dec, 2005
- *Good practice performance measures for kerbside recycling systems*, DEC, February 2004
- *Business Waste Survey*, DEC, 2003 (unpublished)
- *Herbicide risk management tools for the recycled organics industry*. Report prepared by the Recycled Organics Unit, UNSW, DEC, April 2003
- *Alternative Waste Technology (AWT) Assessment Manual and Tool*, DEC, 2003
- *The Buy Recycled Guide*, 3rd edition, Resource NSW, 2003
- *Hunter Region Recycling Directory*, Resource NSW, 2003

Appendix 2 – DECC programs and Strategy result areas

Program area	Project Name	Project contribution to Strategy result areas[42]			
		Waste avoidance	Increased recycling (and targets)	Reduced toxicity	Reduced litter and illegal dumping
Local Government	Improved practice resource recovery		■		
	Littering and Illegal dumping			□	■
	Local Government Buy recycled	■	■		
	Council Networks and Systems Development		■		
	Waste Not DCP		■		□
Resource Recovery	Away from Home		■		
	Commercial		■		
	Glass Fines		■		
	Timber		■		
RID Squads				□	■
Regional and Local Government Support			■	□	□
Specific Waste Streams	Household Chemical Collections			■	□
	Regional Household Chemical Collections			■	□
Education	OEILT Council Partnerships	□	□	□	
	Ethnic Communities Sustainable Living	□	□	□	□
	Children and Young People	□	□		□
	Waste Education Guidance	□	□	□	□
Business Partnerships	Business partnership programs	□	□	□	
	Business Sustainability	□	□		

[42] ■ shows primary project focus; □ shows secondary focus

Program area	Project Name	Project contribution to Strategy result areas[42]			
		Waste avoidance	Increased recycling (and targets)	Reduced toxicity	Reduced litter and illegal dumping
	Compacts				
	Education for Compliance			□	□
	Cleaner production for Licensed premises	□	□	□	
Organics	Catchment rehabilitation		■		
	Cost Benefit in Agriculture		■		
	Compost promotion		■		
	Food waste		■		
	Council parks and gardens		■		
	Compost Australia – Roadmap		■		
	Recycled organics Unit				
	Trial Sites		■		
	Recycled Organics in stormwater		■		
Government	Waste Reduction And Purchasing Policy (WRAPP)	□	■		
Product Stewardship	National Packaging Covenant	□	■		□
	Product specific projects		■	□	

Appendix 3 – International targets

Country / region	Waste stream	Targets	Method	Remarks
Canada	Municipal, C&I and C&D	50% reduction in disposal rates by December 2000 (using 1989 as base year)	Not known	Most provincial governments have launched their own programs to achieve this goal. Nova Scotia reports exceeding the target but Ontario reported a diversion rate of only 28%. Ontario has set a new goal for diversion of waste from disposal being 60% by 2008.
Denmark	C&I	65% recycling of waste from industry by 2004	Not known	In 2003, 60% of the waste from this sector was recycled. In recent years, the recycling rate has been around 62%.
Denmark	C&D	Attain 64% recycling rate of C&D Waste by 2004	Not known	Denmark has exceeded its target for 2004 with 94% of C&D waste recycled.
Denmark	C&D	90% reduction in C&D waste generation by 2004	Not known	Target appears not to have been achieved. C&D waste generation has increased every year from 1994 to 2004.
EU	Municipal	Landfill Directive for member countries to reduce amount of biodegradable municipal waste going to landfill to 75% of 1995 level by 2006 to 50% of 1995 level by 2009 to 35% of 1995 level by 2016	Legislation	The EU landfill directive sets landfill reduction targets leaving the choice of instruments to member states. For the 2006 target only 12 of the 25 member states submitted their national strategies for the landfill directives.
EU	Tyres	Ban on landfilling whole tyres by 2003 Ban on landfilling shredded tyres by 2006	Legislation	
France	Municipal, C&I and C&D	By 2002 only non-reusable, non-recyclable and non-dangerous waste can be disposed of to landfill	Legislation	No information available on whether target was achieved
Germany	Municipal, C&I and C&D	Ban on landfilling of inadequately pre-treated wastes from June 2005	Legislation	No information available on whether target was achieved
Italy	Municipal, C&I and C&D	35% of all waste materials to be segregated and collected separately by law by 2003	Legislation	It appears that Italy has met, or has come close to meeting its target. Waste to landfill has decreased from 77% in 1997 to 60% in 2003

Country / region	Waste stream	Targets	Method	Remarks
New Zealand	C&I	10 major businesses to be participating in waste minimisation programs by December 2005	Voluntary	Several private sector initiatives and a draft report by Ministry suggest that this target might have been met
New Zealand	Municipal and C&I	Eight businesses in different sectors will have introduced extended producer responsibility pilot programs by December 2005	Voluntary	Target appears to have been met: About 200 signatories have signed the revised New Zealand Packaging Accord. Industry has also initiated EPR programs for oil, whitegoods, mobile phones and electronic equipment.
New Zealand	Municipal	By December 2005, - 60% of garden wastes to be diverted from landfill and beneficially used. - 95% diversion of commercial organic wastes from landfill to beneficial use.	Not known	The targets appear to have not been met due to lack of end-markets as well as insufficient collection systems and public information infrastructure. Also, commercial organic wastes had required more closely controlled processing.
New Zealand	Hazardous wastes	20% increase in recovery and recycling rates for priority hazardous waste by December 2012	Legislation	Yet to be assessed.
New Zealand	C&D	50% reduction of C&D waste to landfill by December 2005.	Not known	Target appears to have been met.
Spain	Municipal	6% reduction in municipal waste by 2002 based on 1997 levels	Not known	Target appears to not have been achieved: Reports indicate that from 1999 to 2001 municipal waste in Spain increased by about 7%
Sweden	Municipal	The quantity of landfilled waste to be reduced by at least 50% by 2005 compared to 1994 levels.	Legislation	Target appears to have been met. Sweden reportedly recycles over 40% of municipal waste with incineration levels remaining constant at 40%. In 2004 the share of waste being landfilled was under 10%.
UK	C&I	To reduce by 2005 the amount of C&I waste sent to landfill to 85% of that landfilled in 1998.	Not known	Target appears to have been met by 2003. C&I waste to landfill decreased from 32.1Mt in 1998 to 27.7Mt in 2002/03.
UK	Municipal	Reduce biodegradable municipal waste landfilled to 75% of 1995 level by 2010 to 50% of 1995 level by 2013 to 35% of 1995 level by 2020	Voluntary	Yet to be assessed.

Country / region	Waste stream	Targets	Method	Remarks
UK	Municipal	To recycle or compost: at least 25% of household waste by 2005 At least 30% of household waste by 2010 At least 33% of household waste by 2015	Legislation	UK appears to be near target. 2004/05 unaudited figures show that English households recycled more than a fifth of their waste, (~ 23%).
US	Municipal	To recycle 35% of municipal solid waste by 2005	Not known	Figures leading up to 2005 show the US recycled 27% of its municipal waste - a decline from previous years, which were typically about 30%). When combined with incineration figures the numbers are close to 35%.
State of California, US	Municipal, C&I and C&D	50% diversion of waste from landfill by December 2000	Not known	Target was close to being met. California reported an overall diversion rate of 42% in 2000 and 48% in 2002.
State of Minnesota, US	Municipal	Eliminate landfilling of all unprocessed municipal waste by 2008	Not known	Yet to be assessed.

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Foreword

We are living in a time where we understand more about our planet and our ecosystems and the impacts of human activity. Without careful management, these impacts could have long lasting effects on our environment and our way of life.

We have the responsibility for ensuring that as both a government and a community, we do everything that we can to reduce the burden on our environment and our precious resources. This will ensure that they do not suffer irreversible harm and that they are still there for future generations to use and enjoy.

Immediate issues such as water shortages and climate change require decisive and coordinated responses. But we also need to make sure that as our focus is drawn to these major problems we keep an eye to the ongoing challenges we have sought to tackle in the past.

Avoiding waste, re-using and recycling have been part of our lives for many generations. These actions are something our parents and grandparents were already doing and they are still strongly supported today. But what many of us don't realise is that waste reduction and recycling can also make a big contribution to reducing greenhouse gas, saving water and saving energy. For example, the more than 6 million tonnes that NSW is currently recycling is already avoiding over 3.3 million tonnes of CO_2 equivalent.

The 2007 Waste Avoidance and Resource Recovery Strategy reflects national and international best practice and the experience gained from our own work in NSW over the past decade. It identifies priority actions that will guide the work of all key groups in NSW in contributing to the minimisation of environmental harm from waste disposal and the conservation and efficient use of our resources.

The 2007 Strategy is an important next step in our progress toward meeting our goals of driving down waste and increasing our recycling rates. I encourage you to work with the Department of Environment and Climate Change towards this important goal.

Phil Koperberg
Minister for Climate Change, Environment and Water
September 2007

1 Introduction

The *Waste Avoidance and Resource Recovery Strategy 2007* (*Waste Strategy 2007*) updates the *Waste Avoidance and Resource Recovery Strategy 2003* (*Waste Strategy 2003*).

The underlying policy drivers behind *Waste Strategy 2003* were the need to maximise conservation of our natural resources and to minimise environmental harm from waste management and disposal of solid waste. These drivers are even more important in 2007 against a backdrop of a growing population in NSW and a healthy economy that is producing more goods and services.

Waste Strategy 2007 continues to provide guidance and priorities for action to ensure that efficient resource use and impacts on the environment are considered throughout the life cycle of goods and materials. This includes extraction of raw materials, manufacturing, distribution, consumption and recovery for reprocessing or safe disposal. These drivers are strongly supported by a community that is becoming more knowledgeable and more attuned to the threats and limitations to our basic resources such as water, energy, raw materials, habitats and atmospheric gases that previous generations have taken for granted.

While policies and programs relating to waste avoidance and resource recovery are only part of the toolbox that governments can use to protect the environment and conserve resources for future generations, a waste and resource recovery perspective is something that everyone can relate to. This means that consistent and equitable approaches can be developed to encourage and influence behaviour. The focus at the waste reduction and resource recovery end is also a practical and accessible way of tackling resource use that preserves the economic health of NSW and does not threaten the life aspirations of individuals or of different generations.

Since *Waste Strategy 2003* was released, there has been mounting scientific research that has quantified the benefits and impacts of waste related actions to other parts of the environment e.g. water savings, conservation of virgin resources, greenhouse gas and soil health. There has also been a growing understanding that actions taken to tackle any environmental or resource use issue are strongly interconnected in people's minds. This means that continuing to encourage waste related actions, such as recycling, that are practical and relatively easy to undertake, can naturally lead to actions on other important environmental issues such as reducing energy and water consumption.

All of these factors reinforce the importance of a Waste Avoidance and Resource Recovery Strategy for NSW.

Waste Strategy 2007 has been produced in light of current national and international practice, and emerging trends and challenges. It identifies priority actions that will guide the work of all key groups in NSW in contributing to the minimisation of environmental harm from waste disposal and the conservation and efficient use of our resources. The Strategy focuses on solid wastes that, unless recovered and diverted to beneficial uses, would be disposed of to solid and inert waste landfills throughout NSW.

1.1 Data for Waste Strategy 2007

Waste Strategy 2007 is based on more reliable and more extensive data than its predecessor.

Since 2003 the measurement of waste disposal tonnages has been greatly improved through a new electronic reporting system introduced by the then NSW Department of Environment and Conservation (DEC). This system has enabled the capture of data on additional tonnages of materials going to landfill and more accurate analysis and verification than was previously possible. The additional tonnages are for approved operational purposes (such as waste soils used daily to cover the tip face) or materials exempted from the waste levy under the former *Protection of the Environment Operations (Waste) Regulation 1996* (such as waste generated through community service activities including Clean Up Australia).

The new waste data system has been refined and updated to include all of these additional tonnages being disposed to landfill from 2000 to 2004-05. This refinement of the data system has increased the reported total waste disposed of by approximately 250,000 tonnes per annum – primarily in Sydney region tonnages in construction and demolition (C&D) and commercial and industrial (C&I) waste streams.

The new waste data system has also allowed a number of specific waste streams to be measured accurately for the first time. The most important of these new waste streams is virgin excavated natural material (VENM), which is important due to its sheer size. Better data can now identify how much VENM there is and where it is arising, presenting new opportunities for promoting and supporting its reuse[1].

Progress has been made on the collection of recycling and reprocessor data although these data sets still require improvement. Reprocessor data remains un-audited and does not capture every NSW reprocessor. Recycling data has not been collected every year so it involves a degree of estimation and tends to be understated, which in turn impacts on total waste generation data. Some of the problem lies with the fact that material is increasingly being reprocessed on site, either in industrial applications or on larger construction sites, which means it does not enter a stream where it can be measured and reported.

It is not always possible to link performance changes to specific policy, programs or economic settings that have been developed to target waste or resource use. In some cases, the changes and trends described can be attributed to other external factors. For example, there have been substantial changes in recent years in the tonnages of organic waste disposed of and recycled due to recent and ongoing drought conditions across NSW. Another example is growing OH&S concerns relating to asbestos. This appears to be resulting in less source separation and increased disposal of some demolition wastes, including illegal dumping.

The amount of construction and major infrastructure work occurring in different areas in any year also affects performance and resulting data. In particular this can affect the amount of soil and fill generated in a region, the demand for these materials from other potential users, and how much of the material needs to be disposed of.

Finally, it should be noted that major changes in infrastructure have not yet impacted the recovery figures in NSW. It is anticipated, for example, that the UR3R Alternative Waste Technology facility at Eastern Creek and several other major investments will be reflected in future recycling figures.

[1] See also Page 12

2 Performance to date

Waste Strategy 2003 identified waste avoidance and resource recovery goals and targets in four key result areas. These are retained in the 2007 Strategy and are:

1. preventing and avoiding waste;
2. increasing recovery and use of secondary materials;
3. reducing toxicity in products and materials; and
4. reducing litter and illegal dumping.

In 2004 a progress report provided data and described programs undertaken by the DEC and a range of other stakeholders that were contributing to the Strategy's targets and the four key result areas. The 2006 Performance Report published in conjunction with the consultation draft of the Strategy[2] provided a further update of data and programs. This is available as a separate document on the DECC website[3].

Data relating to current performance is also provided in the section below.

2.1 Performance at a glance

Waste disposal and resource recovery in NSW is measured regionally through the Sydney Metropolitan Area (SMA), the Extended Regulated Area (ERA) comprising the Hunter, Central Coast and Illawarra regions and the Non-Regulated Areas (NRA) encompassing the remainder of the State.

The big picture

- NSW is recycling more of its waste in 2004–05 with total recycling in NSW increasing from 45% in 2002–03 to 46% of total waste created. Waste disposal has dropped from 55% of the total tonnes generated to 54%.
- In 2006, NSW recycled 770,000 tonnes of food, garden and wood waste. As compost applied to land, this can save around 500 megalitres of water or the equivalent of 200 Olympic swimming pools by reducing runoff and evaporation.
- More tonnes of waste were generated in NSW in 2004–05 compared with 2002–03 although this does not take into account population growth or economic growth.
- All together, NSW business, construction and households generated around 1.3 million tonnes more waste in 2004–05 than in 2002–03.

Disposal

- Sydney disposed of 7.2% less waste per person in 2004–05 than in 2000; this is 94kg less per person.
- The Hunter, Central Coast and Illawarra regions disposed of 1.3% more waste per person in 2004–05 compared with 2000; this is 12kg more per person.

[2] NSW Waste Avoidance and Resource Recovery – *Strategy and Performance Report 2006* - Consultation Draft (DEC Sept 2006)

[3] www.environment.nsw.gov.au

- Sydney has reduced the amount of waste per $100 spent (GSP) by 11.4% since 2000 (down from 3.12kg/$100 in 2000 to 2.8 kg/$100 in 2004–05).
- The Hunter, Central Coast and Illawarra regions have reduced the amount of waste per $100 spent (GSP) by 1.9% since 2000 (down from 2.05kg/$100 in 2000 to 2.01kg/$100 in 2004–05).

Recycling

- Sydney recycled 49% of the total waste it created in 2004–05 compared with 48% in 2002–03.
- The Hunter, Central Coast and Illawarra regions recycled 50% of their total waste in 2004–05 compared with 47% in 2002–03.
- Tonnages of recyclables (packaging and organics) collected at kerbside in Sydney increased from 125kg per person in 2000 to 137kg per person in 2004–05.
- Packaging collected from kerbside increased from 88kg per person in 2000–01 to 101.5kg per person in 2004–05.

Total waste created

- Sydney generated 390,000 tonnes more waste in 2004–05 (8.9 million tonnes (mt) compared with 8.51mt in 2002–03).
- Between 2002-03 and 2004-05, per capita, Sydney waste generation increased by 3.0%.
- Hunter, Central Coast and Illawarra regions generated 300,000 tonnes more waste in 2004–05 (2.27mt compared with 1.97mt in 2002–03).

2.2 Outcome 1: Preventing and avoiding waste

Waste Strategy 2003 identified a goal of holding level the total amount of waste generated over a five-year period.

Reporting on the total amount of waste generated (created) requires two sets of data, namely, tonnages of waste disposed and tonnages recycled[4]. These two sets of data have only been gathered since 2002–03 so it is not yet possible to make strong conclusions about progress towards this goal. The fifth year for this target will be 2007–08.

Total waste generated

Table 1 below shows the total tonnes of waste generated (waste disposed added together with waste recycled) for NSW as a whole as well as for Sydney and the Hunter, Central Coast and Illawarra regions. Total tonnes generated have increased by 1.3 million tonnes over the 2 years. On the positive side, more of these tonnes are now being diverted to recycling (up from 45% to 46% of total tonnes generated).

In 2004-05, out of the total waste generated in NSW, Sydney generated 68% (8.9 million tonnes), 17% (2.27 million tonnes) was generated in the Hunter, Central Coast and Illawarra and the remaining 15% (1.95 million tonnes) was generated in rural and regional NSW.

[4] This calculation does not account for any materials that are either disposed of or recycled on site; it can only measure tonnages of waste reported as being disposed of or recycled.

It should be noted that the tonnage data provided in this Strategy is different from the data outlined for 2002-03 that was provided in the 2004 Progress Report. This is due to the recasting of the disposal data using the new waste data reporting system and correction of a number of errors in the recycling data (see also section 1.1).

Table 1 also shows that Sydney generated 390,000 tonnes more waste in 2004–05 (8.9 million tonnes (mt) compared with 8.51mt in 2002–03) and the Hunter, Central Coast and Illawarra regions generated 300,000 tonnes more waste in 2004–05 (2.27mt compared with 1.97mt in 2002–03).

In rural and regional NSW data remains quite limited. Reported tonnages have increased substantially between 2002–03 and 2004–05 (626,000 tonnes). This may be attributable to improvements in disposal data since 2002-03 when data was limited to only some licensed rural landfills. Better reporting is identifying larger quantities of waste being disposed of and it is anticipated that this figure will continue to grow as the quality of reporting improves.

Table 1: Tonnes of reported waste generated for the whole of NSW, Sydney, Hunter, Central Coast and Illawarra, and rural and regional NSW – 2002-03 compared with 2004-05

	Total Generation[5] (tonnes)	**% Recycled (all waste streams)**
2004-05		
NSW	13,118,000	46%
Sydney	8,901,500	49%
Hunter, Central Coast and Illawarra	2,268,000	50%
Regional and rural NSW	*1,948,500	*22%
2002-03		
NSW	11,804,000	45%
Sydney	8,513,500	48%
Hunter, Central Coast and Illawarra	1,968,500	47%
Regional and rural NSW	*1,322,000	*28%

* rural and regional data is limited; indicative figures only

Waste generation per capita

The amount of waste we create can also be looked at on a per person (per capita) basis. This measure enables a more direct comparison to be made between different years by taking into account changes in the number of people living in NSW. Table 2 below, shows the amount of reported waste generated in 2002–03 and 2004–05 on a per capita basis. As shown, the total reported waste generated in NSW has increased by around 171 kilograms per person during this period. In Sydney it was 70kg/capita more and in the Hunter, Central Coast and Illawarra it was 213 kg/capita more (across all waste streams).

A greater proportion of the total waste generated by each person is being recycled instead of being thrown away. This is a good trend; however, every single person in NSW still needs to look for opportunities in all aspects of their life to further reduce the amount of waste they create in the first place.

[5] Note that figures are rounded

Table 2: Tonnes of reported waste generated per capita for the whole of NSW, Sydney, Hunter, Central Coast and Illawarra, and regional and rural NSW – 2002–03 compared with 2004–05

	Total Generation (kg per capita)
2004–05	
NSW	1,948.9
Sydney	2,376.1
Hunter, Central Coast and Illawarra	1,767.1
Regional and rural NSW	*1,145.1
2002–03	
NSW	1,777.6
Sydney	2,306.6
Hunter, Central Coast and Illawarra	1,554.6
Regional and rural NSW	*785.6

*indicative only; data is limited

2.3 Outcome 2: Increasing recovery and use of secondary materials

By 2014, NSW aims to increase the recovery and use of secondary materials in the three major waste streams as follows:

- Municipal waste – from a baseline 26% to 66%
- Commercial and industrial (C&I) waste – from a baseline 28% to 63%
- Construction and demolition (C&D) waste – from a baseline 65% to 76%

This section provides data on progress in reducing amounts disposed of and increasing recycling. It should be noted that the tonnage data provided in this Strategy is different from the data outlined for 2002–03 that was provided in the 2004 Progress Report. This is due to the recasting of the disposal data using the new waste data reporting system and correction of a number of errors in the recycling data.

Waste disposal

Together, the Sydney and the Hunter, Central Coast and Illawarra areas produce most of the waste in NSW, disposing of more than 5.7 million tonnes (80.2%) of waste in 2004–05.

There are several different ways of measuring waste: on a per capita basis; by measuring absolute tonnages; or against the level of economic activity. Each of these measures is described in this section.

Per capita waste disposal

Sydney is performing reasonably well in terms of the amount of waste disposed of per person, with an overall decrease in per capita waste disposal of 94kg or 7.2% since the year 2000. This is shown in Table 3.

Table 3: Changes in waste disposal per capita in Sydney by waste stream - 2000 to 2004–05

Year	Municipal (kgs/person)	Commercial and Industrial (kgs/person)	Construction and Demolition (kgs/person)	Total (kgs/person)	% change since 2000 (%)
2000	355	645	315	1,315	
2000-01	349	578	229	1,156	-12.1%
2001-02	340	523	295	1,158	-11.9%
2002-03	321	550	319	1,190	-9.5%
2003-04	302	580	356	1,237	-5.9%
2004-05	272	600	349	1,221	-7.2%

By waste stream, the decrease was strongest in the municipal waste stream, where per capita waste disposal was down 83kg, followed by the commercial and industrial waste stream - down 45kg/person. However, these gains have been partially offset by an increase in the construction waste stream, up 34kg per capita between 2000 and 2004–05.

By contrast, the Hunter, Central Coast and Illawarra regions have increased total weight of waste disposed of per person by 12 kg/person or 1.3% since 2000. This is made up of an increase of 9kg per capita for municipal waste and 49kg per capita for construction waste since the year 2000. Commercial waste has rallied against this trend, down 45kg per capita. This is shown in Table 4 below.

Table 4 : Changes in waste disposal per capita in the Hunter, Central Coast and Illawarra regions by waste stream - 2000 to 2004–05

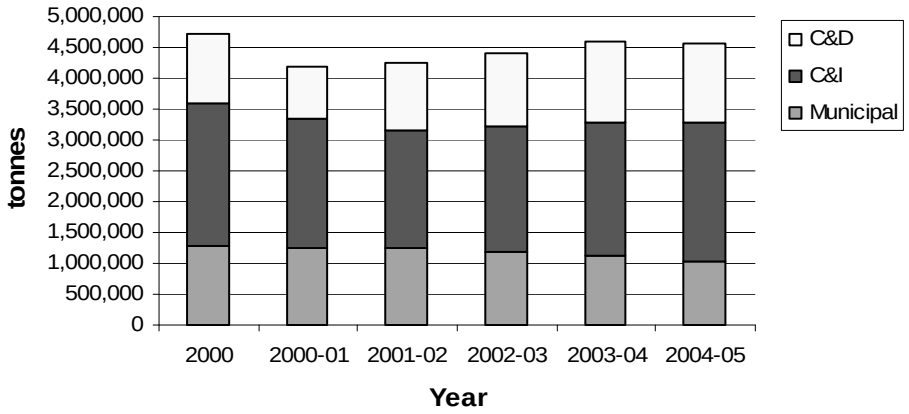
Year	Municipal (kgs/person)	Commercial and Industrial (kgs/person)	Construction and Demolition (kgs/person)	Total (kgs/person)	% change since 2000 (%)
2000	369	327	167	864	
2000-01	362	268	142	772	-10.7%
2001-02	376	253	133	762	-11.8%
2002-03	379	257	183	819	-5.3%
2003-04	387	308	204	899	4.0%
2004-05	378	282	216	876	1.3%

Tonnages of waste disposed

Tonnages of waste disposed of are presented below for the period 2000 to 2004-05. As noted above, however, changes in total tonnages are most useful if they are compared alongside another variable such as population or Gross State Product. For example, considered in isolation, it is difficult to know if an increase in total tonnages is a positive or negative trend. However, if changes in population are known, it is possible to judge the trend. For example, if the population grew by less than the amount of waste, then on a per person basis waste would actually be increasing. Alternatively, if there are more people and businesses in NSW, even though total waste has increased, there could be little actual change (or even a decrease) in the amount generated by each individual or company.

Overall tonnages of waste disposed of in Sydney across all three waste streams were down 3.4%, or 159,176 tonnes, between 2000 and 2004–05.

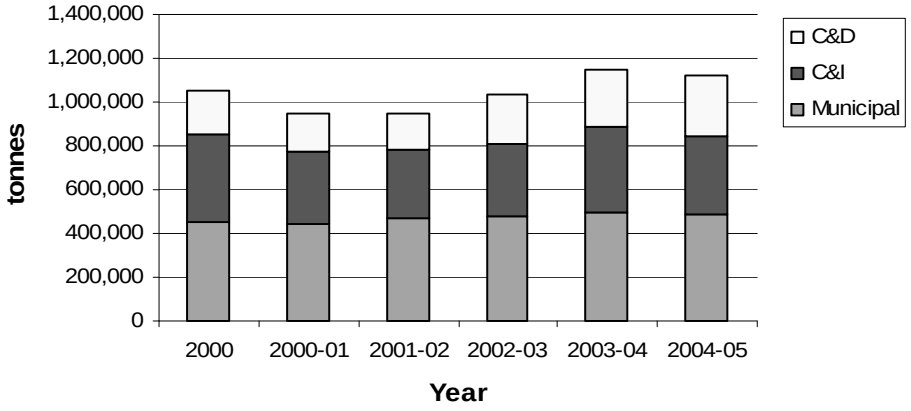
Graph 1: Waste disposal in Sydney - 2000 to 2004-05



Tonnages of municipal waste and commercial waste disposed of in Sydney in 2004–05 were less than in 2000 but these gains were offset by an increase in the amount of construction waste that was disposed of in the same period.

By contrast, and consistent with the per capita trend, waste disposed of in Hunter, Central Coast and Illawarra regions increased 6.5%, or 68,871 tonnes, between 2000 and 2004–05. Tonnages of commercial waste disposed in the period were less than in 2000 but this gain was offset by increased disposal of municipal and construction waste.

Graph 2: Waste disposal in Hunter, Central Coast and Illawarra - 2000 to 2004-05



In rural and regional NSW, improved data is being reported from both licensed and non-licensed landfills. This has provided a different data picture in 2004–05 to the one presented in the previous Strategy. The 2003 Strategy estimated that about one million tonnes were disposed of from all waste streams, but the data was not complete and was limited to rural licensed landfills. Improved 2004–05 data from both licensed and unlicensed landfills suggests that 1,401,685 tonnes were disposed of. It is likely that this increase is mainly due to improved data as well as population and economic growth in regional and rural NSW over the past few years. As disposal data improves even more it is likely that reported tonnages from rural areas will continue to grow.

Waste disposal per $100 GSP

The amount of waste disposed can be calculated against the State's key economic indicator, Gross State Product (GSP), and represented as kilograms disposed of per $100 spent. On this basis there was improvement between 2000 and 2004–05.

Sydney performed best having dropped from 3.12kg of waste for every $100 spent to 2.80kg (down 11.4%). The Hunter, Central Coast and Illawarra regions reduced by 1.9%, down from 2.05 kg per $100 spent in 2000 to 2.01kg in 2004–05[6].

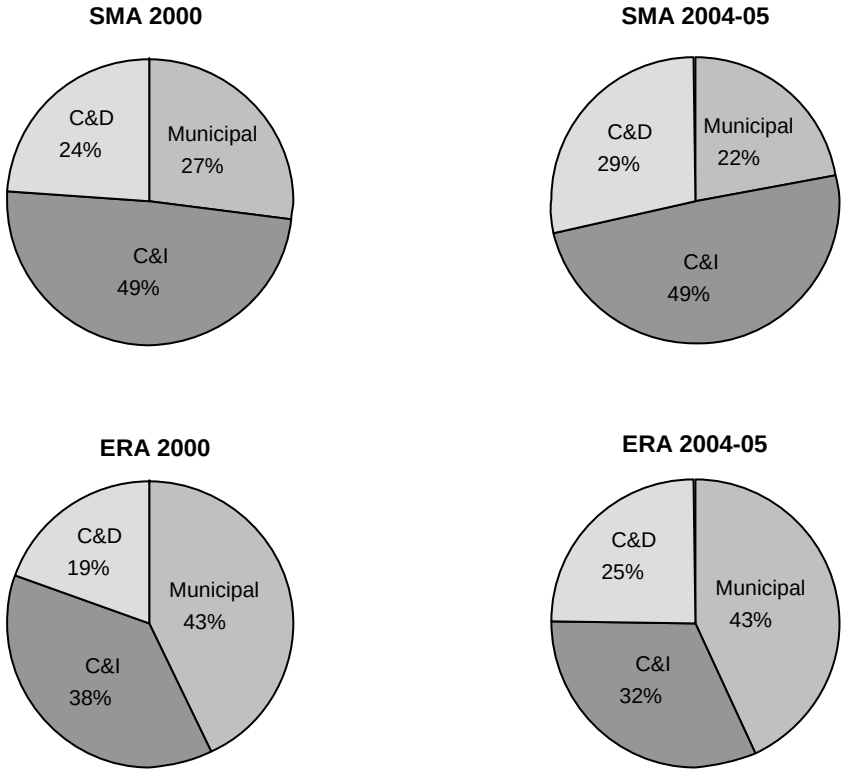
Where the waste comes from

The proportion of waste coming from each of the three waste streams, municipal, commercial and construction has remained largely unchanged since 2000.

In Sydney, commercial waste still accounts for almost half of total waste (49%) disposed of. There is slightly less municipal waste (down from 27% to 22%) and construction waste has increased slightly (up from 24% to 29%).

In the Hunter, Central Coast and Illawarra regions, the municipal waste stream is still the largest (43%). The commercial waste stream has reduced slightly (down from 38% to 32%) and construction waste has increased slightly (up from 19% to 25%).

Graph 3: Proportion of waste in each waste stream for Sydney (SMA) and for Hunter, Central Coast and Illawarra (ERA) - 2000 compared with 2004–5



There is insufficient data to accurately calculate the proportions of waste across the three waste streams in regional and rural NSW. Data from licensed landfills reporting to DEC in 2004–05 suggested that the split was 45% municipal, 27% commercial and 28% construction waste.

[6] GSP data is sourced from ABS Cat No 5220.0 Australian National Accounts: State Accounts.

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 the result of industrial, commercial, mining or agricultural activities. Previous analysis has distributed this material across the three major waste streams. In addition, very little VENM has previously been reported as much of it has been put into landfills and claimed for operational purpose so it was not counted in previous disposal calculations.

The improved data shows that VENM has largely been a Sydney-based issue and that tonnages have increased substantially since 2000 – up from 784,951 tonnes to 1,285,205 tonnes in 2004–05.

Recycling

Recycling data is compiled from a number of sources:

- a DECC state wide survey of companies that reprocess recycled materials;
- information reported by local Councils about amounts and composition of materials collected through kerbside recycling;
- annual analysis of the amount of garden organics being recovered and reprocessed[7]; and
- annual analysis of the amount of plastics being recovered and reprocessed[8]
- recycling tonnages reported to DECC by landfills.

The recycling data set out below is likely to understate the real level of recycling in NSW. This is because material is increasingly being reprocessed on site, either in industrial applications or on larger construction sites, which means it does not enter a stream where it can be measured and reported.

Table 5 shows changes in recycling performance across the three waste streams for the whole of NSW, Sydney and Hunter, Central Coast and Illawarra. For NSW as whole, 46% of total waste was recycled in 2004-5 compared with 45% in 2002-03. By waste stream, 33% of municipal waste was recycled, 38% of commercial waste was recycled and 62% of construction waste was recycled.

The greatest changes have occurred in the amount of C&I waste recycled in NSW (increased by 463,000 tonnes or 34% since 2002-03). There was also an increase of 166,000 tonnes of construction waste recycled (6%) and an increase of 92,000 tonnes of municipal waste recycled. On the disposal side, municipal waste has decreased by 11,500 tonnes for whole of NSW. Commercial waste and construction waste have has increased by 341,000 tonnes and 263,000 tonnes respectively.

[7] National survey conducted annually by Compost Australia; specific NSW data supplied to DEC

[8] National survey conducted annually by the plastics and Chemicals Industry Association (PACIA); specific NSW data supplied to DEC

Table 5: Changes in recycling performance across the three waste streams for the whole of NSW, Sydney and Hunter, Central Coast and Illawarra (ERA) - 2002–03 to 2004–05.[9]

Municipal

	Total Disposed (tonnes)	Total Recycled (tonnes)	Total Generation (tonnes)	% Recycled
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 2004-05	1,021,000	605,000	1,626,000	37%
Sydney 2002-03	1,185,000	595,000	1,780,000	33%
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 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 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* 2004-05	362,000	401,000	763,000	53%
ERA* 2002-03	325,000	269,500	594,500	45%

Construction and Demolition

	Total Disposed (tonnes)	Total Recycled (tonnes)	Total Generation (tonnes)	% Recycled
NSW 2004-05	1,971,500	3,146,500	5,118,000	62%
NSW 2002-03	1,708,000	2,980,500	4,689,000	64%
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* 2004-05	277,000	504,000	781,000	65%
ERA* 2002-03	232,000	473,000	705,000	67%

Total NSW

	Total Disposed (tonnes)	Total Recycled (tonnes)	Total Generation (tonnes)	% Recycled
NSW 2004-05	7,099,500	6,018,500	13,118,000	46%
NSW 2002-03	6,506,500	5,297,000	11,804,000	45%
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* 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

[9] Note that all figures are rounded

Based on all available data, in 2004–05 Sydney recycled 49% of the total waste it created - an improvement on the 48% recycled in 2002–03 and the estimated 38% recycled in 2000[10]. Of the remaining 51% of waste that was not recycled, virtually all was disposed of to landfill. This situation will change with alternative waste treatment facilities more recently coming on line.

By waste stream, more municipal waste was recycled in Sydney - up from 33% to 37% recycled, and the proportion of commercial waste recovered for recycling was also up – from 33% to 35% recycled. However, less construction waste was recycled in 2004–05, down from 68% in 2002–03 to 66%.

The Hunter, Central Coast and Illawarra regions also improved. In 2004–05 these regions recovered 50% of the total waste that they generated – an improvement on the 47% recycled in 2002–03.

By waste stream, the best performer for the Hunter, Central Coast and Illawarra regions was commercial which jumped to a recycling rate of 53% in 2004–05, up from 45% in 2002-03. Municipal waste recycling also increased - up from 28% to 33%. Consistent with Sydney, less construction waste is being recycled, down from 67% in 2002–03 to 65% in 2004-05. As noted previously, one of the driving factors behind the reduction in construction waste recycling is the appropriate disposal of asbestos waste and contamination of other demolition wastes with asbestos.

Data for regional and rural NSW is poor and should be regarded as indicative only. Based on available data for 2004–05, these regions recycled in the order of 23% of total municipal waste, 37% of the commercial and industrial waste and 26% of the total construction waste generated.

Organics recycling

The total amount of organics waste (garden, food, wood/timber, biosolids, agricultural) received by NSW reprocessing facilities increased from 1.34 million tonnes in 2003–04 to 1.41 million tonnes in 2004–05.

As shown in Table 6, since 1998, the proportion of garden organics collected for recycling has increased from 40% to 56% in Greater Sydney (Sydney, Hunter, Central Coast and Illawarra).

Table 6: Tonnage of garden organics recycled 1998, 2002–03 and 2004–05 and as a percentage of total garden waste generated

Garden Organics – Greater Sydney Region			
	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

The majority (80%) of the State's garden waste disposal is in Sydney.

[10] Estimate provided by Wright, 2000: *Report of the Alternative Waste Management Technologies and Practices Inquiry*

Markets for recycled organic materials grew by 6.5% between 2003–04 and 2004-05. This growth occurred in all markets except biofuels, with the biggest growth in the rehabilitation market, which doubled between 2002–03 and 2003–04. Intensive agriculture uses have also grown (10% per year) and extensive agriculture uses have grown at 7% per year.

Kerbside recycling

The performance of kerbside recycling continues to show that efficient systems that are easy to use can deliver good quantities of material for recycling. As council contracts have been reviewed, improved systems have been introduced. Adding together tonnages from both dry recyclables and organics collections, overall collection from kerbside systems in Sydney has increased from 125kg per person in 2000 to 137kg per person in 2004–05.

Kerbside recycling of dry recyclables

More councils are now providing kerbside recycling collections for packaging and paper. 109 councils are now providing kerbside collections, a 7% increase since 2000. On average, 95% of households have access to the service within each council area and average householder participation is constant at 80%.

There has been a big increase in systems using mobile garbage bins since 2001 (up from 50% of councils to 68%), and overall tonnages collected through these systems continue to grow. 593,000 tonnes were collected state wide in 2004-05, compared to 450,000 tonnes in 2000–01.

In Sydney, each person set aside 101.5kg of material for recycling in 2004–05 compared with 88kg in 2000, and recovery per household now amounts to an average of 283kg per year.

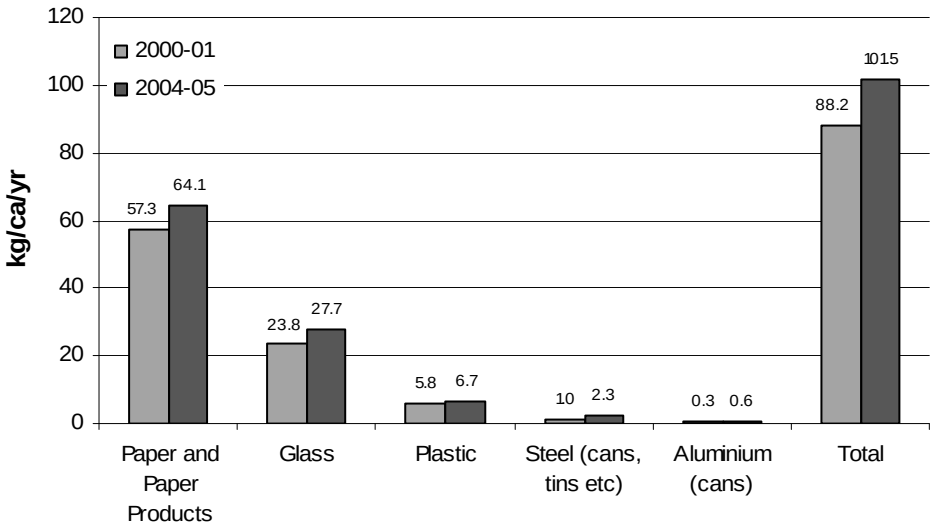
In terms of materials being recycled, there has been an annual increase in the recycling of every major material, with the average householder's annual contribution to recycling in 2004-05 by category as follows:

- 64.1kg of paper and paper products
- 27.7kg of glass
- 6.7kg of plastic
- 2.3kg of steel cans and
- less than 1kg of aluminium cans[3].

Graph 4 below shows changes in the amounts recovered through kerbside recycling of these major materials between 2000-01 and 2004-05.

[3] Survey of Councils' domestic recycling performance for the National Environment Protection Measure (NEPM) 2004-2005

Graph 4: Annual dry recyclables collected at kerbside (kg per capita) - 2000–01 and 2004–05



Kerbside recycling of garden organics

In Sydney more collection systems for garden organics have been introduced with 29 out of 38 councils offering a service in 2004-05. The amount of organic material being recovered per household has remained steady since 2000 at around 94kg.

Contribution to other key environmental drivers

Since *Waste Strategy 2003,* the community has been demonstrating a growing concern about key environmental issues such as water conservation, climate change and greenhouse gas reduction and air quality. In response to this growing community interest, the benefits and contribution from waste reduction and recycling to areas such as water savings, conservation of virgin resources, greenhouse gas reduction and improved soil health are included in this *Waste Strategy 2007* for the first time.

The discussion looks at achievements so far as well as the potential contribution of the additional tonnages that will be diverted with the achievement of the 2014 targets.

Contribution to greenhouse gas abatement

Reducing the amount of waste we put in landfill can reduce greenhouse gas that is created when materials break down in landfills. Recycling organic based materials that decompose can make a big contribution in terms of avoided greenhouse gas. For example, composting 770,000 tonnes of garden, food and wood waste instead of landfilling them avoids almost 1 million tonnes of CO_2 equivalent.[11]

A typical household that is recycling 3.76kg per week (net) is avoiding the equivalent of greenhouse gas emissions from 50% of the electricity used for lighting their home, or 40% of the electricity used for their cooking. On a state wide basis this is equivalent to taking 55,000 cars off the road permanently.[12]

[11] Calculated for DEC by the Recycled Organics Unit, UNSW based on NSW 2006 tonnages : 650,000t of garden organics, 50,000t of food waste and 70,000t of wood waste

[12] Benefits of Recycling (DEC 2005).

Using recycled materials in new products instead of virgin materials can also avoid greenhouse gases. This is because recycling can avoid the gases that are created when the virgin material is transformed into materials for use in products. One of the best examples is aluminium. For every tonne of recycled aluminium that is used, this avoids over 15,000 tonnes of CO_2 equivalent. This is because of the high energy requirement of refining alumina to produce primary aluminium ingots. Substantial greenhouse savings also arise from substituting brown kraft liner made with recycled paper and avoiding the thermo mechanical pulping of virgin wood. A significant benefit is also associated with the recycling of glass, mainly from the avoided processing of soda ash and lime, necessary to produce virgin based glass.

If we consider the 6 million tonnes of waste that was recycled in NSW in 2004-5 and calculate the savings from both not landfilling materials as well as using recycled material instead of virgin, this amounts to a saving of over 3.3 million tonnes of CO_2 equivalent.[13] Continuing to work towards our 2014 recycling targets will increase this contribution even more.

Contribution to water and energy savings

Kerbside recycling makes a significant contribution to water savings, largely by recovering recycled paper that can be substituted for virgin feedstock. This avoids the water intensive wood pulping process for producing virgin fibres. Because the production of aluminium is also a water intensive process, aluminium recycling also contributes high water savings (on a weight for weight basis) by using recycled materials instead of virgin materials.

A typical household can save 3,075 litres of water per year through recycling. This is equivalent to the average water consumption of one person for 12 days or flushing a toilet 615 times. On a state wide scale, some 6,634 megalitres of water is being saved each year through the efforts of households participating in kerbside recycling - enough to fill 2,654 Olympic swimming pools, or the equivalent of between three and five days of Sydney's total water consumption.[14]

By using the 770,000 tonnes of food, garden and wood waste (mentioned above) as compost, this can save around 500 ML of water or the equivalent of 200 Olympic pools by reducing run off and evaporation when the compost is added to soils.[15]

In terms of energy savings, which are the offsets in electricity delivery, process heat and transport, the typical household that actively participates in kerbside recycling delivers a saving of some 928 kilo-Watt hours (kWh) of electricity per year. This is equivalent to 15% of a typical household's total electricity consumption for a whole year, or 8 weeks consumption for each household. Households with high recycling rates can 'save' the equivalent of a third of their total electricity consumption.

On a state wide basis about 2,000 Giga-Watt hours (GWh) of energy are being saved, which is equivalent to the total electricity consumption of approximately 334,000 households or one million individuals for an entire year.[16]

[13] Based on 2004-5 data and GHG conversion factors provided to DEC by Hyder Consulting

[14] Benefits of Recycling (DEC 2005).

[15] Calculated for DEC by the Recycled Organics Unit, UNSW. These water savings are based on some very broad assumptions. These include an application rate of 50 t/ha (may be much higher in urban applications and much lower in agriculture) and water savings of 0.8 ML/ha (cotton growers can save 0.13–0.16 ML/ha whilst viticulture can save 0.95 ML/ha. Much higher rates achievable in urban settings)

[16] Benefits of Recycling (DEC 2005).

Much of the energy savings arise from paper/cardboard recovery, where the energy required for harvesting raw materials, subsequent pulping activities and process heat is avoided. On a weight for weight basis the recycling of aluminium gives rise to the greatest savings, due to the energy intensive electrolytic process used to refine alumina to primary aluminium. The energy savings from recycling HDPE and PET are also high due to the energy products (oil and gas) which are used as feedstock to manufacture plastic.

2.4 Outcome 3: Reducing toxicity in products and materials

Waste Strategy 2003 identified a goal of phasing out priority substances in identified products by 2014 or, if not possible, of achieving maximum recovery for re-use. It also identified a need for a cross sectoral steering group to advise on ways to tackle priority harmful substances.

The Extended Producer Responsibility (EPR) Expert Reference Group (ERG) that was formed to monitor sectors identified in the NSW EPR Priority Statement has been encouraging and monitoring industry efforts to reduce toxicity though a focus on the products nominated in the annual EPR Priority Statement. The ERG provided its first report[17] on progress of those wastes nominated in the Priority Statement to the Minister for the Environment in 2005. The *2005–06 Priority Statement* was released by DEC in March 2006.

The Expert Reference Group has specifically raised the issue of potentially hazardous substances in relation to computers, televisions, other consumer electronics, PVC, batteries, fluorescent tubes and shredder floc. Reports provided by these sectors at the end of 2006 indicated some progress. For example, work is underway to introduce an Australian Standard which will reduce the level of mercury in 25mm lamps. The Lighting Council of Australia has also developed a world first standard to measure mercury content in fluorescent tubes.[18] The use of copper chrome arsenate (CCA) as a preservative has been reduced and use in domestic decking has stopped. The use of other treatments such as creosote, tri-butyl tin and various wood preservatives has also reduced considerably.[19]

NSW is also participating in a process being coordinated by the Australian Government to explore the merits and options for introducing similar requirements within Australia as the European Union Restriction of Hazardous Substances (ROHS) Directive which requires the phasing out of mercury, lead, cadmium, hexavalent chromium and two brominated flame retardants in most electrical and electronic products.

2.5 Outcome 4: Reducing litter and illegal dumping

NSW wants to reduce total volumes and tonnages of litter and illegally dumped material reported by regulatory agencies and Regional Illegal Dumping (RID) squads annually, using 2003 as the base year.

[17] EPR Expert Reference Group September 2005: *Report on the Implementation of the NSW Extended producer Responsibility Priority Statement 2004* (published by DEC 2005)

[18] Correspondence from Australian Electrical and Electronic manufacturers Association (AEEMA) to the DEC in Nov 2006

[19] Report from Timber Development Association (TDA) to the Minister for the Environment and the Expert Reference Group in October 2006

Regular monitoring of the amount and type of litter is undertaken by DECC to capture long-term trends in litter across NSW. *The NSW Litter Report 2004*[20] found that based on a survey of 200 sites across the state, NSW scored as 'moderately clean' (3.8 out of a possible 5)[21]. The rating combined an assessment of bin infrastructure and littering behaviour and attitudes. A litter characterisation survey on 60 of these sites found that by volume, cigarettes, plastics, and paper made up more than 80% of litter; by weight, cigarette butts, paper, and glass comprised 70% of the litter stream.

A further litter characterisation survey was carried out for DECC in 2006. In addition to the 60 sites used in 2004, another 40 sites were surveyed making a total of 100. For the 2006 survey and future surveys materials were categorised slightly differently to the 2004 survey. Seven categories were used: Paper, Beverage litter (containers, lids etc), Cigarette litter (butts, packets), Plastic, Confectionery, Organics and Other.

In 2006, by volume beverage container, cigarette, and paper litter made up 80% of litter, by weight, beverage containers and cigarettes were the major contributors making up 54% of litter. By count, cigarette litter made up 59% of all items, followed by beverage containers at 13%.

The number of fines for littering in 2004–05 was 19% higher than in 2001–02, with 7,256 penalty infringement notices (PIN) issued in 2004–05. Most fines are currently for littering from vehicles and are imposed by local councils and RID squads.

The number of stormwater pollutant devices, sediment traps and litter booms has increased, according to Sydney Water. Litter booms in Sydney Harbour collected 84 cubic metres in 2004–05 compared with 66 cubic metres the previous year; Botany Bay traps collected 32 cubic metres compared with 212 cubic metres previously. Of the 1,859 cubic metres collected in 2004–05, about 25% was non-organic, anecdotally reported as packaging and plastics.

Waste Strategy 2003 committed to establishing a Litter and Illegal Dumping Alliance. This Alliance was formed and has a wide-ranging membership including government agencies, Councils and non-government organisations (NGO). It is chaired by DECC and its role is to guide and coordinate programs to tackle litter and illegal dumping. The Alliance developed a Strategic Action Plan in 2005.

2.6 Other commitments in *Waste Strategy 2003*

Waste Strategy 2003 identified other key actions to support the achievement of waste avoidance and increased resource recovery in NSW. Progress in these areas is summarised in this section.

- The need for better data has been tackled in a number of ways. In addition to the improved waste disposal data system that includes electronic lodgement of data (see section 1.1), formal audits of commercial, industrial and construction waste being disposed of to landfill have been undertaken and will be repeated on a regular basis. These audits have provided important new information and have assisted the development of targeted programs to increase recycling.

- DECC work with the Department of Local Government is delivering more comprehensive data and a streamlined data collection system for local

[20] *The NSW Litter Report 2004*, Department of Environment and Conservation (NSW), Dec 2004

[21] Assessment used the Clean Communities Assessment Tool (CCAT) owned by Community Change

councils. Improved data will also be provided as part of the annual performance payments scheme introduced for local councils in 2006 (see section 3.1).

- The annual DECC survey of reprocessors is helping to establish tonnages being recycled within NSW. A revised NSW reprocessor survey is being used to collect the 2005-06 data to improve its quality.

- Establishment of whole-of-supply chain monitoring, reporting and product stewardship initiatives has been progressed through the release of NSW *Extended Producer Responsibility Priority Statement*s in March 2004 and March 2006, the formation of an Expert Reference Group (ERG) appointed by the Minister for the Environment to evaluate sector performance, and DECC work with a number of the sectors identified in the statement (see section 3.7).

  Work has continued with sectors to improve performance and reporting of progress for existing national schemes for mobile phones, agricultural and veterinary chemicals, chemical containers and polyvinyl chloride. This has resulted in more detailed and comprehensive data being provided for NSW. DECC has also been working with industry and other jurisdictions to implement product stewardship initiatives for computers, televisions, tyres and plastic bags, office paper and treated timber.

- To provide an impetus to thinking about waste avoidance, a DEC discussion paper *Producing and consuming efficiently to conserve our resources*[22] was produced. This was informed by workshops and consultation with community organisations, industry and local government. NSW also contributed funding to the research by the Australia Institute on Wasteful Consumption in Australia (see section 3.5).

2.7 Key programs that are contributing to NSW waste reduction performance

To fulfil its role in leading and coordinating programs that are contributing to Strategy targets and outcomes, DEC has initiated or facilitated a wide range of waste reduction and resource recovery programs. Key areas for action have included:

- better data
- improving understanding of community attitudes and motivations
- supporting markets for recycled materials
- better recovery systems and waste management
- decision making and guidance tools
- government agency initiatives
- identifying partnership opportunities
- better Industry practices and
- producer responsibility.

Details about DEC programs were provided in the 2006 Performance Report that was published in conjunction with the consultation draft of the Strategy.[23]

[22] *Producing and consuming efficiently to conserve our resources*, Department of Environment and Conservation (NSW), February 2004

[23] Available on the DEC website www.environment.nsw.gov.au

In addition, actions by industry, other government agencies, Councils and other organisations are contributing to continued waste reduction and resource recovery in NSW. Key initiatives that will make a substantial contribution over the next 3 years include:

New Infrastructure or systems – commenced or currently being implemented

- The UR3R-WSN/GRL joint partnership at Eastern Creek
- Macarthur councils-(Camden , Campbelltown, Wollondilly and Wingecarribee) Regional contract to build an AWT (ArrowBio); starts January 08
- Southern Councils Group (Bega Valley, Eurobodalla, Kiama , Shellharbour, Shoalhaven, Wingecarribee, and Wollongong) - Regional Contract
- New Visy MRF at Smithfield
- Coffs Harbour - new AWT Biomass. Regional facility (Coffs Harbour, Nambucca, Bellingen Councils) mid 2007
- New garden waste recycling services for households in Penrith, Liverpool, Baulkham Hills and Ryde
- New C&I MRF in West Gosford

In Planning stage

- Hunter Integrated Resources (Cessnock, Lake Macquarie, Maitland and Newcastle) - Regional AWT facility
- Visy (Tumut) – Plant upgrade announced; increase in paper recycling capacity
- Visy Smithfield packaging and recycling facility upgrade; increase in recycling capacity
- AMCOR (Botany) Plant upgrade announced; increase of paper recycling capacity
- Benedict Sand and Gravel – proposed wood waste co-generation plant
- Blue Circle Southern Cement – non standard fuel investigations (including wood waste)
- New municipal MRF at Somersby
- Orange Reprocessing centre

Policies/Planning (Department of Planning)

- New Infrastructure SEPP

3 Emerging drivers and challenges

In preparing *Waste Strategy 2007*, DECC has reviewed recent environmental, economic and social trends, as well as emerging issues that are influencing waste reduction and waste management. This includes national and international trends and issues.

The underlying policy drivers behind *Waste Strategy 2003* were the need to maximise conservation of our natural resources and to minimise environmental harm from waste management and disposal. These drivers are even more important in 2007 against a backdrop of a growing population in NSW and a healthy economy that is producing more goods and services.

The Strategy framework provides one of the checks and balances needed to ensure that efficient resource use and impacts on the environment are considered throughout the life cycle of goods and materials, including extraction, manufacturing, distribution, consumption and recovery for reprocessing or disposal.

These environment protection and resource conservation drivers are not just strongly supported but increasingly demanded by a community that is becoming more knowledgeable and more attuned to the threats and limitations to many basic resources, such as water, energy, raw materials, habitats and atmospheric gases, that previous generations took for granted.

Some of the key changes and emerging drivers since 2003 are discussed below.

3.1 Legislation and policy drivers

Waste management and resource recovery policy in NSW is not static. A number of key policy changes have occurred since 2003 in response to improved data, performance of existing policies, technological improvements, changing economics of the waste management and resource recovery industry, community expectations and stakeholder concerns.

NSW's major economic instrument for waste, the Waste and Environment Levy (the Levy), has been reviewed and changes were announced in late 2005. In July 2006 scheduled increases to the Levy were introduced, with the levy increasing by an additional $6 per tonne over the next five years (plus CPI adjustments). This means that by 2010–11 the Levy will reach $56 per tonne in the SMA and $52 per tonne in the ERA (excluding CPI).

The new Levy aims to provide stronger incentives to reduce waste to landfill and to encourage increased resource recovery and recycling. Higher disposal costs will help make innovative recycling and recovery waste processing options more attractive and competitive for potential investors and existing companies within the waste collection and reprocessing sectors. The Levy will also fund a substantial range of environmental programs, including an annual performance payments scheme for local government in the leviable area; to reward waste reduction and help deliver improved waste service performance standards.

Analysis of the Levy's impact to date has shown that it has already been an important driver and encouraged more recycling, particularly for large tonnages of materials and for heavy wastes such as construction and demolition waste. Increasing the Levy will distribute this effect across a greater range of materials. It will also encourage the

establishment of additional recycling capacity by providing a financial offset that enables recyclers to more easily compete with disposal facilities for materials.

Progressive increases in the Levy over the past few years have also assisted organics recycling by making the cost of recycling more competitive with landfill. For example, garden organics recycling in the Greater Sydney Region has increased from 40% of the total generated in 1998 to more than 57% in 2004-05. While no coordinated organics recycling existed in NSW in 1990, by 2005 there were 61 licensed composting facilities and 87 local Councils[24] provided regular garden organics recycling services in 2004-05, up from 71 in 2002-03. NSW is now leading the nation in organics recycling.

At the same time it is recognised that increases in the Levy might trigger other pressures that will need to be addressed by innovative regulatory and enforcement approaches. In particular, rising costs for the proper management of waste are likely to increase the likelihood of illegal dumping, and might lead some to pursue 'reuse' strategies that would unacceptably harm the environment. These potential avenues for environmental harm have been recognised and programs have been developed to address this, including recent amendments to the *Protection of the Environment Operations Act 1997* (the Act) and the associated regulations. For example:

- Legislative changes have been made to the definition of waste in the *Protection of the Environment Operations Act* to distinguish bona-fide waste reuse opportunities from more traditional forms of managing waste for disposal. These changes will provide industry with the incentive and certainty required to pursue further reuse and recovery opportunities.
- A new Land Pollution Offence has been included in the Act to protect landholders and the environment from damage caused by the inappropriate application of harmful substances to land.

Amendments have also been made to the *Protection of the Environment Operations (Waste) Regulation 2005* to create an integrated, streamlined system for 'waste tracking'. 'Waste tracking' is used across Australia to minimise the possibility that wastes will be transported or disposed of inappropriately. The new regulations have delivered a clear, practical and enforceable system to ensure the appropriate transport and disposal of high-risk wastes.

In addition to legislative and regulatory changes since *Waste Strategy 2003* was released, a number of policy statements have reinforced some basic principles that underpin policy and regulatory settings in NSW. These include a statement on the importance of source separation of recyclables, which is one of the cornerstones of resource recovery. Separation of recyclable material from wastes at the point where the waste is created leads to the recovery of much better quality material. This means that it can potentially be recycled into a far wider range of quality uses. By contrast, mixing recyclables and waste together can limit re-use as well as adding unnecessary sorting costs.

Councils have also been encouraged to limit their contracts for waste disposal to landfill to shorter terms rather than the 20-year agreements that have characterised

[24] Data derived from NEPM (2004/05). Note that this figure includes 47 councils with kerbside collections, 17 councils with a garden organics cleanup service (but no kerbside collection) and 23 councils that offer 'other residential' recycling services only (e.g. drop-off).

contracts in the past. This will enable Councils to maintain maximum flexibility in responding to new, emerging technologies for recovering wastes.

3.2 Technology and infrastructure changes and challenges

As foreshadowed in *Waste Strategy 2003*, policy, regulatory and economic settings in NSW have been driving increasing demand for new recycling technologies to recover and utilise more materials and for alternative waste technologies to treat the residual portion of waste that would previously have been disposed of to landfill. These technologies are especially relevant for councils in the Sydney, Newcastle, Central Coast and Wollongong areas. Some major regional centres might also provide sufficient material to justify alternative treatment plants, particularly where there are potential opportunities to combine with neighbouring councils in areas of high growth. The application of new technologies is less likely to be a viable option in rural areas, where a small population base is coupled with high transport costs.

The challenge for future technologies is to ensure that final outputs provide sufficient environmental, economic and social benefits to justify the investment and minimise harm to the environment or human health.

Another key driver for future infrastructure will be its capacity to process different feedstock. Factors such as the type of waste, surety of supply, international market prices, availability of substitute raw materials, market demand for outputs and government policy settings will all affect the waste that a facility has available to it. It will therefore be important for it to be able to adapt to changes in feedstock without substantially threatening its economic viability.

In the medium term, NSW is likely to see a growing trend towards integrated waste management approaches that employ both residual waste treatment and recycling.

The growing demand for purpose-designed infrastructure will bring challenges for infrastructure planning and guidance. These will need to play an increasingly important role in either supporting or restricting opportunities for increased resource recovery. The challenge will be greatest where new facilities are established to service the existing, ever-consolidating Metropolitan Region. Facilities will need to be installed at locations that optimise logistics since logistics costs constitute around 60% of the total waste management value chain. Logistics relate to distance travelled, access issues and the relationship to the network of facilities such as transfer stations, material recovery facilities (MRF) and alternative waste technology (AWT) facilities. These are some of the most important factors influencing the commercial success of a waste management operation.

Building facilities close to waste sources is more feasible for new development areas. Early planning can reduce land use conflicts and can also enable the trialling of innovative waste management concepts including new schemes for source separation, collection, and transfer.

To facilitate improved infrastructure planning, the NSW Government has introduced a new project approval regime for the assessment and approval of major projects by the Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979*. This approval regime and the State Environmental Planning Policy (SEPP) – Major Projects were gazetted in August 2005.

The SEPP defines certain waste infrastructure developments as major projects to be determined by the Minister for Planning under Part 3A. Criteria for resource and

waste related infrastructure projects are set out in Schedule 1 of the SEPP. Many new waste, resource recovery and recycling facilities will now be assessed and determined by the Minister for Planning.

A new draft Infrastructure SEPP which consolidates and updates planning processes for new infrastructure also underwent public consultation in 2006 and will be gazetted in 2007. This SEPP streamlines planning provisions by identifying classes of infrastructure development that can be approved by consent authorities without the need for a formal development consent process if the development does not significantly affect the environment. The SEPP lists zones that have been identified in relevant Environmental Planning Instruments, such as Local Environment Plans, for waste management facilities and waste transfer stations. The new SEPP should assist the development of these facilities in the future.

The Department of Planning is currently preparing a discussion paper to underpin the development of a waste and resource recovery infrastructure strategy for the Sydney metropolitan area. The proposed strategy is intended to guide private sector planning and decision-making.

There have been major improvements in recovery infrastructure and systems since *Waste Strategy 2003* was released. A number of councils have improved their municipal waste management through adopting better practice in collection systems, assisted by benchmarking of good practice by various DEC programs. In addition, co-operative agreements between groups of councils are delivering regional processing arrangements that aggregate the waste and recyclable material. Such approaches are contributing to substantial benefits such as:

- reduced environmental impacts
- high quality municipal waste management services for smaller councils
- stabilised pricing and provision of price certainty over the period of the contract
- maximised resource recovery and reduction in material disposed to landfill
- improved householder behaviour/practice through consistency of services and information delivery
- community access to state-of-the art recycling facilities and best practice collection services and
- savings through cost sharing between participating councils for such things as legal costs, production of information and implementation of education programs.

3.3 Market development for recycled content products

Successful waste reduction and resource recovery relies on healthy markets for the materials that are sent for recycling. In recent years, a growing number of consumers, especially governments and businesses, have been using their purchasing power to develop markets for materials with recycled content. Examples include use of recycled materials such as glass fines in asphalt; application of recycled organics to stop erosion along roadsides and to reduce water use in managing parks and gardens; and using tyres as an alternative to existing building materials or as a substitute to standard fuels. NSW state government agencies and Councils are also respectively supporting purchase of recycled content materials through their Waste Reduction and Purchasing Plans (WRAPP) and the Council *Sustainable Choice* program.

However, choosing recycled content products is still not a widespread practice. Extensive research conducted for DEC across industry, state and local government[25] clearly identified price and performance as the major drivers for purchase for goods and services.

Many recycled content products find it difficult to compete on price. This is because reduced demand leads to smaller production runs, which in turn increases the per unit price. Solving this depends on encouraging purchase by more users, especially larger buyers such as big corporations and governments, but there is a reluctance to adopt new products without clear evidence of an economic benefit from their use. Governments and major companies therefore have a clear role to play in market development as they have considerable purchasing power and can influence demand for environmentally friendly products.

Other key barriers include lack of information about availability of alternatives, environmental benefits and product performance as well as lack of warranties or guarantees. In the absence of reliable technical data on the applications and the benefits of products with recycled content, adoption will continue to be slow. Other barriers to purchasing recycled content products include organisational structure, lack of leadership and corporate procurement policy drivers, and fear of changing established purchasing practices.

Despite the ongoing challenges, there has been some increased use of recycled content products over the past few years, which has enabled some benefits to be quantified. These include environmental benefits such as reducing the need for virgin materials and reduction in greenhouse gas by substitution with recycled materials. Economic benefits have included cost savings and performance and workability advantages. [26]

3.4 Research to support recycling and waste reduction

Research projects conducted or supported by DEC over the past few years have illustrated the benefits of recycling and will assist those who are advocating or adopting changed practices to deliver new or improved systems for their community. Other research has been undertaken to assist with understanding of current broad community or specific stakeholder group perceptions, knowledge and behaviour about a range of issues such as waste, recycling, waste avoidance, use of and purchase of recycled content products and linkages between waste and other environmental and sustainability issues. A list of recent research is included in Appendix 1.

3.5 Reducing waste generation

Tackling consumption is perhaps the greatest challenge facing efforts to reduce the amount of waste produced by our society. The amount of waste we create is strongly linked to how much we spend and buy. Increasing consumption is a global phenomenon, due mainly to growing affluence in many countries. It is also due to changes in lifestyle, with demand for smaller food portions, individual pre-prepared food portions, and growing health and safety issues.

According to the OECD, global per capita private consumption has increased steadily over the last two decades, and is expected to continue to follow GDP growth in the period to 2020. Between 1995 and 2020, household waste is projected to grow by

[25] *Encouraging demand for product with recycled content,* December 2004, undertaken by Instinct and Reason Pty Ltd

[26] See 2006 Performance Report P 16-18 DEC (2006)

43%. Although recycling rates have also increased, slowing the growth of waste destined for final disposal, total volumes of waste produced continue to grow.[27]

Trends in Australia demonstrate a similar picture. In 2003 the Australian Bureau of Statistics (ABS) reported that Australians were consuming more resources and generating more waste than at any time in our history. This was mainly due to our growing population and increasing high standard of living. The ABS concludes that Australia is among the top 10 solid waste generators among OECD countries and without changes to consumption patterns this trend will continue.[28]

Recent research into consumption patterns in Australia by The Australia Institute (March 2005)[29] showed that in 2004 the average Australian household wasted $1,226 on items purchased but not used (equivalent to approximately one month's repayments on an average Australian home mortgage). More than $10.5 billion dollars is spent each year on goods and services that are never or hardly ever used. Food was the biggest item, at a total cost of $5.3 billion. The report concluded that Australians live a contradiction – they express concern about the environment but live wasteful lifestyles.

In New South Wales there has been great support for and participation in recycling since the early 1990's and this is where governments and communities have focussed their efforts, education and infrastructure. Equivalent actions to reduce consumption and encourage a reduction in waste generation are much harder to find, although there are examples at the company level through cleaner production programs, and in offices through reduced paper use. Perhaps the most recent example is the reduction in plastic bag use by the community.

The Australia Institute Report also highlighted some new issues that are going to make the task of reducing consumption even more difficult. It identified a whole new psychology that is emerging relating to compulsive shopping and retail therapy. According to the research, improved self-concept and getting pleasure through the act of shopping itself (as opposed to the goods actually purchased) are becoming powerful drivers of consumption. The report warned of a possible anti-environmental backlash from continued pressure to change behaviour, increasing denial about the extent of the problem, or blaming others to avoid changing behaviour.[30] It suggested possible action for two areas of neglect: innovation in product service delivery systems, and economic and social policies that encourage a shift to non-consumptive means of achieving well-being[31].

3.6 Community support and expectations

Strong community support for waste reduction has been demonstrated by increasing household recycling rates and participation in other waste programs. In 2004, Sydney residents set aside, on average, more than 100kg of material for recycling, which was 17kg more than in 1990. There has also been an increase of 30% over three years in attendance at household chemical drop off sites, with over 43,000 people depositing more than 1.5 million kg of chemicals.

[27] '*Towards sustainable household consumption? Trends and policies in OECD countries',* OECD Policy Brief, July 2002, pp 3-4

[28] *Australia's Environment: Issues and Trends*, Australian Bureau of Statistics, ABS Catalogue no. 4613.0, July 2003, pp. 133-135 and 156

[29] Wasteful Consumption in Australia, Discussion Paper No 77, Australia Institute, March 2005

[30] Ibid pp. (xi)

[31] Ibid pp. 12

The '*Who Cares about the Environment in 2006?*'[32] showed that the people of NSW continue to value the environment, with 93% of the respondents saying the environment is important or very important to them. More than half the respondents (53%) ranked the environment third in importance to them after family and friends.[33]

Recycling and waste disposal are among the issues considered important by the majority of those respondents to the 'Who cares' survey who ranked waste as a significant issue for NSW. Management of plastic bags, reducing packaging waste and litter and illegal dumping were specific issues highlighted by respondents as important areas for action.

The community also strongly supports waste reduction measures with more than 60% of respondents to the 'Who Cares' survey saying that they adopted such measures as product re-use, choosing more environmentally friendly household products, avoiding the use of plastic bags and avoiding products with excessive packaging.

The survey also showed that the community wants to see further improvement in waste avoidance, with more people in NSW (up from 19% to 26%) considering that the situation with regard to reducing the amount of waste that community generates is getting worse or much worse compared to 2003. More than half of the respondents (55%) thought that households should pay a charge based on the volume of the waste that they produced.

The community also continues to have high expectations of Government to use a range of policies and tools to encourage efficient use of resources and to discourage unnecessary disposal. The 'Who Cares' survey showed that only 17% of people in NSW thought that the NSW Government was doing enough to protect the environment and 81% thought that the Government needs to do more. With regard to environmental regulations, the survey showed that:

- 96% of people in NSW believe that the aim of environmental regulations should be to improve rather than merely maintain the health of the environment
- 68% disagree with the proposition that environmental regulation is restricting or holding back the NSW economy and
- 77% reject the idea that a lower level of environmental regulation is required in NSW.

3.7 Product stewardship and producer responsibility

Since *Waste Strategy 2003* was released more companies and sectors have been re-examining the life-cycle impacts of their products and services. This is in response to growing community expectations that industry will take greater responsibility for its products at end of life.

Pressure for more industry action to better manage and recover their products at end of life is occurring worldwide. In Europe this is being strongly driven through EU regulations that set targets for take back and recycling of products for specific sectors. In the US there is a stronger focus on voluntary industry programs.

Many companies selling in Australia are internationally based and are already having to comply with the design and recycling requirements imposed overseas. Australian companies exporting worldwide must comply in order to compete in overseas

[32] *Who Cares about the Environment in 2006: A survey of NSW people's environmental knowledge, attitudes and behaviour*, DEC, November 2006
[33] Ibid

markets. Most companies are also finding that sound environmental credentials can provide a positive marketing edge.

Governments across the country have been concerned to ensure that Australia does not become a dumping ground for inferior products through lack of action. They will be continuing their EPR (extended producer responsibility) work through the work of State Environment Ministers and the national Environment Protection and Heritage Council.

The EPR challenge for governments and industry sectors in Australia stems from the fact that there is no single solution or system for managing end of life products and solutions will need to be purpose-designed and tailored to the characteristics of the Australian supply chain for each particular product. Implementation of overseas approaches will not directly translate into successful schemes in Australia due to the nature of our economy, population size and distribution.

NSW has participated in and is strongly supportive of voluntary, national solutions. A large percentage of the consumer goods that we use are now imported and many companies selling product in NSW sell throughout Australia as well as producing and selling internationally. Australia's ability to influence the product design of companies manufacturing goods in other countries for an international market is extremely limited due to Australia's market share (often less than 1%). This limits NSW's ability to unilaterally drive reductions in the use of potentially toxic materials used in products as well as re-use and recycling schemes. Working nationally increases NSW's ability to influence product sector commitment and initiatives.

A national council of environment ministers (Australian Government, states, territories and New Zealand) called the Environment Protection and Heritage Council (EPHC), has been addressing product stewardship for sectors for some years. This includes mobile phones, computers, televisions, tyres, plastic bags and packaging. Ministers have signalled their aim to see lightweight plastic bags phased out by the end of 2008. Voluntary agreements are being negotiated for tyres and TVs and mobile phones. Regulatory options are being considered for computers due to the fragmentation and large number of players in the sector and its inability to coordinate a voluntary approach.

In addition, a voluntary National Packaging Covenant was renewed in July 2005 for a further 5 years. This is underpinned by regulation in all states to capture 'free riders' and require them to take action that is comparable to those who have joined the voluntary Covenant. This maintains a level playing field in the marketplace. A mid term review of the Covenant will be conducted by end 2008 following which EPHC will signal whether a different approach is needed to reduce packaging.

NSW has also used its annual EPR Priority Statement process to identify 'wastes of concern' and start an ongoing dialogue with a range of sectors. These includes office paper, timber, batteries, paints and other electrical products such as large electrical products and lighting.

The NSW community expects all sectors and especially those nominated as wastes of concern in NSW to increase their efforts to improve design, cut down on manufacturing waste, and actively drive initiatives to increase recycling of end of life products. Such actions clearly need to be economically viable, simple for the community to use, and to deliver results that are positive for the environment in terms of saved resources and reduced impacts.

4 Waste Avoidance and Resource Recovery Strategy 2007

The NSW *Waste Avoidance and Resource Recovery Strategy 2007* is designed to provide a continuing framework that will guide actions to achieve the Government's policy objectives of minimising environmental harm from waste generation through to disposal, and conserving and maximising resource use.

4.1 Principles

Waste must continue to be tackled across the whole life cycle of goods and materials including extraction, manufacturing, distribution, consumption and recovery for reprocessing or disposal. Action to avoid and prevent waste needs to be considered at every step in this cycle with a focus on those points in the chain where the impact and results will be most effective.

Waste Strategy 2007 continues to recognise the importance of the waste hierarchy to guide effective resource management. It acknowledges, however, that different materials require different approaches. The choice of approach, including re-use, recycling and energy from waste, will depend on a balance of factors including economic and environmental considerations. Other factors that will influence the approach adopted for specific materials include: availability of supply; markets for recyclate; economic; environmental and social impacts; community responses to different collection; reprocessing and disposal options; and emergence of new technologies.

All other principles identified in *Waste Strategy 2003* remain important and will continue to underpin NSW policy and actions to conserve resources and reduce waste. These principles include a commitment to ecologically sustainable development[34] as well as other principles set out in NSW legislation and international instruments. In summary these principles are:

- *the precautionary principle* – lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation if there are threats of serious or irreversible environmental damage;
- *inter-generational equity* – the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations;
- *polluter pays* – those who generate pollution and waste should bear the cost of containment, avoidance or abatement;
- *full life cycle costing* – users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste;
- *market incentives* – environmental goals should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems;
- *shared responsibility* – industry should share (with the community) the responsibility for reducing and dealing with waste[35];

[34] See section 6(2) of the NSW *Protection of the Environment Administration Act 1991*

[35] sub-section (3)(e), *Waste Avoidance and Resource Recovery Act 2001*

- *system integration* – waste and resource management planning, programs and service delivery need to be integrated on a State-wide basis [36];
- *sustainable production and consumption* – environmentally sound waste management must go beyond the mere safe disposal or recovery of wastes that are generated, and should seek to address the root cause of the problem by attempting to change unsustainable patterns of production and consumption[37];
- *public involvement in decision-making* – environmental issues are best handled with the participation of all concerned citizens, who should have full opportunity to participate in decision making processes, including appropriate access to all relevant information on the environment held by public authorities[38];
- *economic development* – environmental protection should constitute an integral part of the development process and cannot be considered in isolation from it[39];
- *continuous improvement* – policy and actions should support and seek to deliver continuous improvement in the frameworks, infrastructure and systems established to support waste reduction and resource recovery[40];
- *contribute to other environmental sustainability issues* - policy and actions on waste should support and identify their contribution to other key environmental issues such as greenhouse gas abatement and reduction in energy and water use.

The need to work with other jurisdictions in Australia to address waste and resource recovery problems also continues to be cornerstone of the NSW *Waste Strategy*. Many issues cut across State and Territory boundaries due to the increasingly transboundary nature of business activities. Such national approaches operate under the Environment Protection and Heritage Council (EPHC).

4.2 The broader sustainability context

Since *Waste Strategy 2003* was released, there has been a growing understanding that actions to tackle particular environmental or resource use issues are strongly interconnected.

Mounting scientific research is quantifying the benefits and impacts of waste-related actions to other parts of the environment, such as water savings, conservation of virgin resources, greenhouse gas and soil health. This helps to involve and motivate people who might not be so focussed on waste and resource issues per se but will take action because of its related environmental benefits. Social research is also demonstrating that waste actions can naturally lead to actions on other environmental issues such as reduction in energy and water consumption.

There is also an increasing preference to address overall environmental performance rather than focus on single issues, especially by industry. Companies tend to incorporate waste related actions through programs that aim to build on environmental responsibility (compliance), cleaner production efforts, environmental policy and

[36] sub-section (3)(g), *Waste Avoidance and Resource Recovery Act 2001*

[37] *Agenda 21*, UN Conference on Environment and Development, June 1992, paragraph 21.4

[38] Sub-sections (3)(b) and (3)(c), *Protection of the Environment Operations Act 1997*
(See also *Principle 10 - Rio Declaration on Environment and Development, 1992*)

[39] *Principle 4 - Rio Declaration on Environment and Development*, *1992*

[40] sub-section 12(2)(a), *Waste Avoidance and Resource Recovery Act 2001*

planning, supply chain management, internal (staff and contractor) and external stakeholder engagement, as well as regional or sector wide sustainability leadership.

4.3 Key result areas

The key result areas and targets identified in *Waste Strategy 2003* have been retained. They remain relevant in the current NSW economic, environmental and social climate. While they are ambitious, the targets are also realistic goals that will continue to provide an impetus for action across all sectors.

The four key result areas are:

- preventing and avoiding waste
- increasing recovery and use of secondary materials
- reducing toxicity in products and materials and
- reducing litter and illegal dumping.

Broad targets for each key result area

Preventing and avoiding waste	To hold level the total waste generated for 5 years from the release of *Waste Strategy 2003*.
Increased recovery and use of secondary resources	By 2014, to: Increase recovery and use of materials from the municipal waste stream, from 26% (in 2000) to 66% Increase recovery and use of materials from the commercial and industrial waste stream, from 28% (in 2000) to 63% and Increase recovery and use of materials from the construction and demolition sector, from 65% (in 2000) to 76%.
Reducing toxic substances in products and materials	By 2014 or earlier: To phase out priority substances in identified products as a first choice or, if not possible, to achieve maximum recovery for re-use.
Reduce litter and illegal dumping	Reduce total amount of litter reported annually. Reduction in total tonnages of illegally dumped material reported by regulatory agencies and RID squads annually.

In addition, the NSW Government has recently adopted the *State Plan, A New Direction for NSW*. One of the five focus areas within the State Plan is Environment for Living. Improved waste minimisation and management contributes to the following priorities listed under Environment for Living:

- Priority E1: A secure and sustainable water supply for all users
- Priority E2: A reliable electricity supply with increased use of renewable energy
- Priority E3: Cleaner air and progress on greenhouse gas reductions
- Priority E4: Better outcomes for native vegetation, biodiversity, land, rivers and coastal waterways.

Conserving our resources and reducing the amount of waste we put in landfill can make a substantial contribution to each of these priorities (see section 2.3).

4.4 Framework for action

DECC will continue to provide the lead in implementing *Waste Strategy 2007*, however it is clear that continued support and collaboration will also be needed from other groups, including local government, industry and community. Local Councils in particular play a pivotal role in many areas relating to waste and recycling. Programs are run by individual Councils, in partnership with the NSW government or as part of a regional approach with other Councils and sometimes local businesses. Key NSW Government-Council collaborative projects include illegal dumping squads and education, sustainable purchasing, using recycled content materials, household chemical collections, community education and work with small and medium businesses to improve waste management.

In many cases, programs run by DECC or other stakeholders will contribute to results in more than one of the outcome areas identified in the Strategy. Key areas where action is needed are discussed below. A three-year outlook and an outline of priority work needed in the medium term are also provided. This is based on a consideration of the changes and emerging challenges that were discussed in the previous Chapter.

Programs that DECC will implement in key action areas are also included. Programs are designed to contribute to the outcomes in the Strategy and a summary of key programs and their contribution to the Strategy result areas is provided in Appendix 2. Not all programs contribute directly to increased tonnages diverted from landfill or increased recycling. Some have more indirect, longer term effects that need to build up over time. For example, programs that focus on capacity building with particular groups to provide knowledge and skills to take actions on a range of sustainability issues, including waste programs that focus on collecting better data and improving knowledge and reporting, education programs, product stewardship programs and programs that test performance of recycled materials e.g., organics.

Waste avoidance is not included as a discreet program area. This is because, consistent with the growing desire for a more integrated approach to environmental issues, action to avoid waste needs to be part of a broader program that is tackling either waste related or sustainability issues. DECC programs that have a strong waste avoidance component are briefly described at the end of this section.

Providing a supportive policy and regulatory framework

Focus for action

- *Supporting regulation under Protection of the Environment Operations Act 1997 to enable exemptions for wastes or waste derived materials used as fuel or applied to land*
- *Increased awareness activities coupled with consistent regulatory action to encourage better waste management practices*
- *Continued guidance for Councils about emerging waste management and technology issues, including food waste*

Providing industry with regulatory certainty

In May 2006, the *Protection of the Environment Operations Act 1997* (the Act) definition of waste was amended to provide the ability to clearly delineate where waste or waste derived substances that are land applied or used as fuels no longer need to meet the regulatory requirements for waste.

The Act's definition of waste states that waste includes "any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations". This amendment will become effective when the supporting regulation is made to provide greater certainty to those involved in resource recovery operations. It is proposed that the regulation would allow exemptions to be made for wastes or waste derived materials used as fuel or applied to land where it was shown that the proposed application was of benefit, did not cause harm and is fit for purpose.

This refinement of the regulatory framework will help further stimulate recycling and resource recovery whilst ensuring that our environment is protected.

Protecting the environment from unacceptable waste practices

DECC will continue to promote compliance by assisting waste operators to understand and meet their legislative obligations while taking strong and consistent regulatory action against those who choose not to comply with the law.

Between July 2003 and June 2006, DEC's Sydney Waste Section completed 31 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 areas such as unlawful disposal of waste at landfills, litter and illegal dumping, proper handling and disposal of asbestos waste, inspection of waste transport vehicles, and the management of liquid waste.

The City and Country Environment Restoration Program announced in November 2005, includes a major crackdown on illegal dumping through stepped up and targeted campaigns over the next five years.

Providing a framework for decisions about collection and reprocessing

DECC will continue to provide guidance to NSW Councils and other waste managers about emerging issues in order to assist their decisions about provision of recycling services and selection of technologies.

DECC has already provided guidance about the importance of maintaining separate recycling collections, use of alternate technologies and the duration of landfill contracts. It has advised that landfilling contracts should not be made for longer than five years since these may restrict opportunities for emerging alternative waste treatment in the near to medium term, reducing our ability to achieve our waste reduction targets and resulting in a poor environmental outcome for the community as a whole.

Whilst Alternative Waste Technologies have the potential to recover significant value from the mixed municipal waste stream this should not detract from source separation and kerbside recovery. Such technologies should be regarded as a complement to, rather than a substitute for, the separate collection of recyclable materials. Separation of materials at the point of generation yields a stream of clean and largely uncontaminated material which maximises the options for recovery and reprocessing. This includes dry recyclables as well as organics.

There is no single solution or configuration for collection services and reprocessing and there are many variables that will affect the type and frequency of the system and service adopted. Factors include 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.

To ensure that resource recovery delivers appropriate environmental outcomes, DECC also encourages recovery of materials from the waste stream that can deliver quality outputs that are fit for purpose, marketable and do not cause harmful environmental impacts. The DECC does not support, prefer or promote any specific technologies or processing systems for particular waste streams.

Reducing commercial and industrial waste

The commercial and industrial waste stream continues to be not only the biggest waste stream in Sydney but also the hardest stream to tackle as it has so many players of different sizes and across different sectors, with diverse and ad hoc recycling systems.

Commercial and industrial waste comes from a wide range of sectors including businesses (small and large), commerce and retail, service providers of all types including hospitality and government agencies, substantial land managers and sites with high public visitation. The varying nature and focus of these generators increases the difficulty in framing broad scale programs.

The range of DECC programs tackling commercial and industrial waste address the issue from different intervention points. Some projects work with individual or groups of businesses to support changes in practice at the point of generation (either reducing waste or producing cleaner, more useable streams). Others work at the system level, at points of collection or reprocessing, to increase the recovery of useable materials. Some projects work to provide guidance for generators of waste and reprocessors to ensure the best quality feedstock and recycled materials. Others focus on potential users of recycled content materials to build demand by demonstrating performance and cost competitiveness.

<u>Programs with business</u>

Focus for action

- *Sustainability Advantage partnerships with geographic and sectoral clusters of industry to tackle waste and other sustainability issues*
- *Sustainability Compacts with sector leaders to change their own practices as well as their supply chains*
- *Joint compliance and cleaner production work with licensed companies*
- *Information and training for key manufacturing sectors in partnership with local Councils*

The majority of DECC-run programs involving business and other organisations have focussed on specific sectors or wastes. This approach needs to continue. In particular, since the late 1990s cleaner production programs have successfully engaged many companies and delivered financial and environmental benefits.

Having made gains from improving waste related processes, many companies are now seeking further support and opportunity to tackle a wider range of environmental issues associated with sustainability. This growing commitment to sustainability by corporate Australia is expected to continue over the coming years.

While profit drivers will continue to be a strong motivator, an increasing number of companies are deciding that their long-term viability depends heavily on superior social and environmental performance. These companies will look to minimise risk and 'add value' by achieving savings from the more efficient use of resources and reduced levels of waste; developing innovative 'green' products and becoming a supplier of choice; building reputation; and increasing staff productivity by providing a clean, healthy and environmentally responsible workplace.

There is an opportunity to leverage this growing business interest in sustainability to translate it into practical and large-scale environmental action. This will require proactive engagement with business on a sectoral, cluster or individual basis. Partnership programs will need to provide business with the knowledge, skills and motivation to significantly improve the environmental performance of their own operations and supply chain, and to be advocates for sector improvement.

The DECC Business Programs will tap into this opportunity. Programs will have a strong waste focus but they will often be delivered through broader sustainability projects, focussing on 'business value' such as reduced costs, improved reputation and productivity increases, as well as environmental gains. This approach suits the preference of larger companies in particular who want integrated rather than single issue approaches.

Between 2006 and 2009, DECC Business Programs will be delivered through three mechanisms:

1. Business Partnerships, including NSW Sustainability Compacts;
2. Cleaner Production for Licensed Premises; and
3. Education for Compliance and beyond.

The Business Partnerships Program will focus on partnering with medium to large companies as this offers outstanding opportunities to address waste issues through supply chain links. The lead program in this area will be *Sustainability Advantage*, which will bring together companies in industry sector and geographic clusters. A management diagnostic will assist firms to identify and prioritise waste and other environmental projects. Companies will work in a minimum of three of the following areas:

- *Vision, Commitment and Planning* – a business vision that includes environmental commitment (policy and strategy) and planning to drive and embed environmental improvement;
- *Environmental Risk and Responsibility* – risk management, self-assessment, education and training and on-ground action to help ensure compliance with environmental law;
- *Resource Efficiency (cleaner production)* – action to reduce resource use and lower the volume and toxicity of waste and emissions, while increasing profits (includes facilities management);
- *Supply Chain Management* – active collaboration within the supply chain to improve environmental performance;
- *Stakeholder and Staff Engagement* – staff involvement in sustainability planning, direct action at work and volunteering (includes work with external stakeholders and 'neighbour of choice' initiatives); and
- *Climate Change* – identification of both risks and opportunities.

Cleaner production work will continue but this will focus on licensed premises as part of the regulatory relationship.

Sustainability Advantage will work with a broad cross-section of industry, but will place an emphasis on developing partnerships with priority sectors that operate in metropolitan and regional areas. This will include, but not be limited to:

- Commercial Property – existing partnerships will be expanded with major property owners and managers in Sydney to improve performance and reporting against waste and recycling benchmarks and to address waste from daily operations (paper/cardboard, packaging and food) and waste being generated through retrofit and refurbishment.
- Food Processing – collaboration with major food companies on projects that include the recycling of glass and plastic packaging (e.g., polypropylene and polystyrene containers) from product returned to the manufacturer.
- Building Products – collaboration with leaders in the manufacturing of plasterboard, bricks and masonry, floor coverings, concrete and other building products to improve waste outcomes in operations, products and the supply chain.
- Health and Aged Care – initiatives to reduce waste in the health services and aged care sector, delivered in partnership with public and private facilities.
- Registered Clubs – a partnership with ClubsNSW will support efforts by the State's 1,400 registered Clubs to address waste through recycling and reuse initiatives, and purchasing and refurbishment initiatives. A focus will be placed on: organic waste separation and utilisation; recycling of glass, paper and cardboard; and reducing the environmental impacts of building works.

The NSW Sustainability Compacts will also support waste avoidance and resource recovery. These are voluntary agreements with a small number of sector leaders. To date, Compacts have been agreed with Hewlett-Packard Australia (HP), Insurance Australia Group (IAG) and Sensis. Waste issues will be addressed through improvements in four key areas:

- sustainability leadership (e.g., commitment and planning, advocacy and reporting)
- sustainable products and services (redesign, development of innovative new 'environmentally preferable' products and services, and product stewardship)
- efficient production and service delivery (resource, waste and other efficiencies) and
- environmental responsibility (all aspects of the business and, where appropriate, its suppliers, are compliant with environmental legislation).

Through the NSW Sustainability Compacts, support has been provided to IAG to develop a Risk Radar to assist 50,000 agricultural businesses consider environmental and OH & S issues; implement a trial to reuse and recycle damaged home contents; and investigate energy generation at IAG sites. Support has been provided to assist Sensis develop an 'opt-out' option for delivery of print directories and HP has focused on working within the industry to establish a national take-back scheme for computer hardware. As well, DEC and HP will collaborate on 'environmentally preferable' purchasing of information and communication technology equipment for business and government and best practice for the reuse/recycling of printer cartridges.

In addition to *Sustainability Advantage* and the NSW Compacts, resource efficiency (cleaner production) work will also be undertaken in collaboration with premises licensed by the DECC as part of the regulatory relationship.

The Education for Compliance program will deliver projects that help provide the awareness, knowledge and skills that business requires to meet its environmental responsibilities under the *Protection of the Environment Operations Act 1997* and support for the objectives of the *Waste Avoidance and Resource Recovery Act 2001*. The focus will be on changing practices of small and medium businesses through education and training; building the capacity of local government as an industry regulator, educator and operator; and strategic input to formal vocational, education and training initiatives.

While work will be conducted with a range of sectors, an emphasis will be placed on supporting waste initiatives in priority industry groups such as printers, automotive repairers, smash repairers, manufacturers of wood and furniture products, service stations, and boating marina facilities.

Resource recovery and system improvement programs

Focus for action

- *Better market support and system changes through priority materials flow modelling*
- *Partnerships with commercial and industrial businesses, including waste transporters, to improve source separation and recyclables sorting systems*
- *Business planning and financial modelling tool to assist Councils to expand recycling services to small and medium businesses*
- *Research to solve system and contamination problems at key points*
- *New audit to measure composition of commercial and industrial waste being disposed of*
- *Focussed funding to support new market development for priority materials such as glass fines*

The diverse nature of businesses generating commercial and industrial wastes has led to underdeveloped and ad hoc systems for resource recovery. A great deal more work is needed to identify strategic intervention points along the lifecycle of key material streams. These are the points at which there is the greatest opportunity to achieve changes to systems or relationships that will ultimately result in substantially increased tonnages for recycling.

Establishment of innovative collection systems and benchmarking of existing systems to improve performance is needed across a range of sectors. Consistent with data from recent C&I landfill audits the main materials focus will be paper, glass, plastics and timber.

To gain a detailed understanding of the market an annual update of Paper Materials Flows data for NSW has been developed. This is providing accurate data on amounts and flows of packaging paper, office paper, newsprint and tissue paper and will inform future projects for increased paper recovery in NSW.

DECC programs will also concentrate on partnerships with commercial and industrial businesses, including waste transporters, to encourage much higher participation in source separation of materials for recycling. The waste transport industry is a key

part of this focus because it represents a potentially efficient point for the development of improved systems for waste separation and aggregation.

Links will also be made through the DECC local government C&I program. A Business Planning Guideline and Financial Modelling Tool is being prepared to equip Councils with the necessary knowledge and planning tools to develop a sound business case for the provision of recycling services to small and medium businesses. This is currently being piloted with three Councils. A Market Research Guide which assists Councils gather information on their local market for recyclables is also being tested.

Research has also been done to learn more about what might motivate 330,000 small to medium enterprises (SMEs) in NSW to recycle more. Past social research has indicated that broad attitudes within industry to environmental protection are reasonably positive. The information from this new research is helping to develop the strategies for broad scale engagement at the business level and for maintaining participation.

Industry specified standards can assist market development. This approach has already been successful for construction and demolition materials. Recycled glass has been targeted for an industry specification. A number of other partnership approaches are supporting market development for glass fines, for example as embedment for water and sewer mains pipes and assessing the feasibility of using fines as the drainage leachate layer in new landfill cells.

The ongoing increases in the Waste and Environment Levy will also provide a significant opportunity for those involved in the collection and aggregation of commercial and industrial waste to improve recovery outcomes and to take advantage of economies of scale afforded to their operations.

New research is planned to gain a better understanding of how waste from commercial and industrial businesses can be drawn into the recycling streams. In particular, work on ways to improve recovery of specific materials will be undertaken as follows:

- paper – explore improvements to existing collection and treatment methodologies to ensure markets for collected materials are retained and enhanced
- plastics – explore ways to assist industries to increase the segregation and recycling of the various plastic materials
- timber - focus on improving systems for increased recovery, particularly the identification of non-recyclable timbers including some treated timbers so they can be easily excluded from recyclable materials and
- glass fines - identify additional appropriate reuse options for glass fines and develop a ‘greenspec’ for this product, particularly sourced from the MRF operations.

Government programs

Focus for action

- *Streamlined electronic reporting system for agencies including calculator to convert waste contributions to greenhouse, energy and water savings*
- *Increased use of government contracts to support recycled content products and reward responsible supplier recycling services*
- *Transferring good government practices in waste reduction and purchasing to other sectors*

Government agencies will remain an important focus given their purchasing power and the community expectation that governments will show leadership in tackling environmental and sustainability issues.

Government agencies will need to continue to build their capacity for waste reduction and their willingness to purchase environmentally friendly products, including products with recycled content. The requirements of the NSW Waste Reduction and Purchasing Policy (WRAPP) which requires plans and regular reporting by agencies will continue to drive this outcome. Work will focus on better integrating waste and other sustainability actions into the core business of agencies; supporting agencies to streamline reporting and data collection through better systems; and supporting purchasing decision-making through accessible information on performance of 'green' products, particularly recycled content products. There are also ongoing opportunities for the Department of Commerce to incorporate environmental considerations into key government contracts.

DECC programs will continue to provide substantial support to government agencies. The second whole-of-Government WRAPP report was produced in 2006, and the considerable amount of data collected as part of the past three reporting periods has provided the basis for a thorough review of WRAPP. The review will consider the range of materials currently covered and agencies' abilities to contribute to other emerging priorities such as EPR and related environmental issues. These include the NSW Greenhouse Plan and NSW commitments as a signatory to the National Packaging Covenant.

The collaborative work with the Department of Energy, Utilities and Services and the Australian Greenhouse Office to integrate electronic reporting of agency waste performance data into an existing system used for reporting energy use will be completed in 2007. Support for purchase of recycled content products will be maintained and a greater emphasis will be placed on transferring the learning and successes from government to other sectors. There are also growing opportunities to use government purchasing to further drive product stewardship initiatives and DECC will further explore this with the Department of Commerce.

Agencies were due to report again in August 2007 for the period 2005-2007. Any changes flowing from the review will be introduced for the August 2009 reporting period to enable departments to collect any additional data needed.

Reducing municipal waste

Focus for action

- *Performance payments for Councils that improve their waste and recycling practices and results.*
- *Continued support to Councils for sustainable purchasing practices*
- *Tools for Councils to support decisions on systems and technologies, plus education, resources and training*
- *More easy to use standard contracts that reflect best practice performance*
- *Assistance to improve waste and recycling practices in multi unit dwellings*

Significant gains have been made in recovering municipal waste for recycling but this will need continued support. Local government will remain a critical focus. Councils continue to play a key role in managing municipal waste and have the potential to influence other sectors, for example, through community education, by promoting

re-use in households through home composting, business recycling (through potential expansion of recycling services) and business and construction activities (through planning approvals and licensing).

Councils also represent a powerful purchasing block with the ability to support and influence the provision of recycled content products as well as other environmental credentials. Many also practice re-use of their own Council wastes through, for example, mulching of parks and gardens waste and re-use of concrete and other construction materials generated in their operations.

Tools for Local Government to support decision-making and good practice advice will need to be maintained and updated in light of new technologies, performance results, new or changing economic and environmental cost-benefit research, and changing community perceptions and priorities. Programs, tools and training to support Councils in their roles as regulators, operators and educators also need to be maintained.

Opportunities to expand and rationalise existing council infrastructure and services, such as waste collection in the commercial and industrial small to medium enterprise areas will continue to be supported, as well as groups of councils working collaboratively to introduce regionally based resource recovery technologies.

A new opportunity over the term of *Waste Strategy 2007* for both the commercial and municipal waste streams is food waste recovery. Research will be needed and a framework will be developed in collaboration with all key players.

A new key influencer is the growing trend for people to move to units and apartments. This presents new challenges for education, planning and recycling systems to ensure that recycling performance is maintained and improved. Best practice guidelines for both building construction and recovery systems in units and apartments will be needed.

DECC programs will focus on assisting, supporting and working with NSW councils to further increase the efficiency and effectiveness of the resource recovery services they provide, the regulatory instruments they administer, and the functional frameworks in which they operate.

Programs will be delivered through the following streams:

- Improved Practice Resource Recovery
- Local Government Sustainable Purchasing
- Council Networks and Systems Development; and
- Litter and Illegal Dumping (see next section).

The Improved Practice Resource Recovery Program will focus on providing guidance and standard contracts for resource recovery and residual waste processing. Other projects include preferred resource recovery practices for multi-unit dwellings, guidance on design of storage facilities, a composition audit of the clean-up hard waste stream, and finalisation of the business case and development of market research tools to improve resource recovery from small to medium businesses.

Improvements to waste-wise purchasing will be delivered by expanding the Local Government Buy Recycled Alliance into a Local Government Sustainable Purchasing Alliance. This expanded program will work more closely with ECO-Buy (Victoria), to build on their experience.

Implementation of best practice recycling and resource recovery by Councils in the Sydney, Hunter, Central Coast and Illawarra areas will be supported over the next 5 years through Waste Performance Payments as part of the Environmental Trust City and Country Program. Councils will qualify for payments by meeting annual performance standards for recycling and resource recovery. Standards will include the provision of data, such as waste and recycling quantities, composition, costs and contamination rates. They will also include the adoption of good practice waste and recycling service systems as identified and published by DECC. The performance standards will be developed in consultation with the Local Government and Shires Association.

Reducing litter and illegal dumping

Focus for action

- *Continued support to Regional Illegal Dumping Squads to deliver stronger compliance and enforcement programs*
- *Support for Councils to tackle illegal dumping in multi unit dwellings*

Illegal dumping will continue to challenge councils located around the urban fringes of Western Sydney and the South Coast/ Southern Highland areas and continued efforts will be needed to cover both litter and illegal dumping. As part of the Government's recent City and Country Environmental Restoration Program initiative, an additional $18 million has been allocated over the next five years to enable DECC to provide a stronger waste compliance and enforcement program including action to tackle illegal dumping. Ongoing support will be also be needed for the litter and anti dumping initiatives of the eight regional waste groups outside the Sydney, Hunter, Central Coast and Illawarra regions (see next section).

The Litter and Illegal Dumping Program will also include support for the strategic action plan and priority programs of the Litter and Illegal Dumping Action Alliance. The Alliance has developed a three-year plan, which identifies priority actions to tackle litter and illegal dumping in NSW. The focus over the next three years will be on increasing the level of awareness of the social, environmental and economic impacts of litter and illegal dumping, as well as supporting enforcement officer education. The illegal dumping program also includes the implementation of the Multi Unit Illegal Dumping Prevention Campaign Kit, which involves officer training and a grants program to guide councils implementing the program.

Supporting waste reduction in rural and regional NSW

Focus for action

- *Continued program funding for 8 voluntary regional waste groups covering 90% of rural and regional NSW*

The eight Voluntary Regional Waste Groups, which cover 90% of rural and regional NSW, have undertaken three-year regional planning for 2006-09 in consultation with their member councils. Programs have been designed to tackle the regions' waste and resource recovery issues and to contribute to the State's waste and resource recovery targets. These programs tackle waste across each of the three key waste streams – municipal, commercial and industrial and construction.

DECC will continue to provide funding support for key programs identified in the regional plans. These build on the considerable successes of the past few years and include:

- regional consolidation of waste facilities and services to improve environmental outcomes
- an increased focus on resource recovery in the commercial and industrial sectors
- integrated management planning for organics processing and reuse within the regions
- waste reduction and management planning with local businesses and
- improved data that can be used to encourage the establishment of reprocessing facilities and development of local markets.

Reducing construction and demolition waste

Focus for action

- *Support to develop systems to identify non recyclable timbers from readily re-useable timbers to increase recovery of wood waste*
- *More 'greenspecs' for major materials to increase re-use*
- *Further support for Councils to implement Waste Not DCP*
- *Guidance to ensure removal of asbestos from other useable construction materials*

Recycling of material from the construction and demolition (C&D) waste stream has been very successful over recent years. This is because the materials involved are relatively easily separated at source and also due to their weight and volume. They have also responded best to the economic driver of the waste levy because avoiding disposal represents huge cost savings.

Although waste has been reduced significantly in this stream, recent audits indicate that substantial quantities of some materials are still being disposed of. As noted previously, a driving factor behind the reduction in construction waste recycling is contamination of other demolition wastes with asbestos. Coupled with unresolved technical issues such as the ability to separate some non-recyclable timber from the rest of the timber stream (see below), there are substantial challenges facing this sector over the next few years.

On the positive side, the initial results of the C&D Audit have allowed operators to better understand the nature, composition and quantity of specific materials being presented at landfills. This is resulting in the recovery of more materials, through the use of additional or different processing systems or technology. This is particularly so for materials presented in a finer fraction of the waste stream and previously not recycled. There has been a significant increase in investment in reprocessing infrastructure over the past 12 months. Several new C&D recovery facilities are planned or under construction. These will significantly add to C&D reprocessing capacity.

Markets for many recycled products are well established, mainly in metropolitan areas, but more are needed, particularly for materials such as glass fines. Markets also need to be expanded in some regional and rural areas. This may require the establishment of additional recycling processes in some areas.

Timber is a major component of construction and demolition waste, but the lack of a system to readily identify and extract non recyclable timbers such as some treated timbers from readily reusable timber is a major impediment to the large scale recycling or re-use of used timber. A collaborative effort between industry and government will be needed to address this and other barriers to increased recovery

of wood waste. Treated timber has been identified as a priority waste under the NSW Extended Producer Responsibility Priority Statement.

To provide some surety for the re-use of construction materials, 'greenspecs' have been developed for some products through collaborative industry and government projects. More 'greenspecs' are needed to cover all major materials recovered through this sector, including fill materials and timber.

A number of councils have already implemented a development control plan called the Waste Not DCP to further improve source separation of waste material from the construction and demolition industry. Following the planning reforms of 2005 and work with the Department of Planning, a consultation process will be undertaken to revise the current Waste Not DCP. Once finalised, the new DCP will be accompanied by training and will inform an evaluation of related DECC programs for 2007–08 and 2008–09. The DCP has the potential to drive increased recycling of demolition and construction waste, as well as improved provision and on-going management of suitable waste and resource recovery facilities.

Other specific waste streams

Focus for action

- *Continued market development programs to encourage use of recycled organics by Councils, Catchment Management Authorities, Government Agencies, mines, agriculture and sports and recreation facilities.*
- *New market study to identify current uses and opportunities for recycled organics*
- *Continued scientific trials to prove the benefits of recycled organics in a range of uses*
- *Development of strategies to tackle municipal and commercial food waste*
- *Continued funding of Household Chemical Cleanup program*
- *Work with government departments to identify potential major users of VENM*

Organics

The most significant problem for this secondary resource stream is that the growth in markets (~14% p.a.) has not increased at the same rate as diversion from landfill (~19% p.a. average over the five years before the drought). The recent drought has also reduced the amount of material presented for processing, thereby reducing the revenue stream for processors. It has also impacted severely on the nursery and landscaping industries, which are major markets for recycled organics.

While increases to the Waste and Environment Levy, announced in 2006, will further drive the diversion of organics from landfill, continuing investment in market development is necessary. A framework developed in collaboration with all key players is also needed to support and create more impetus for the recycling of food waste from both the commercial and municipal sectors. On the supply side, work is needed to improve recycling systems, particularly by reducing contamination rates.

To date, DEC and industry programs have been very successful in increasing markets for recycled organics. The market has more than doubled in six years (from 370,000 m^3 in 1998 to 847,000 m^3 in 2004), but accelerated work is needed to create and grow markets in order to close the increasing gap between supply of organics for recycling and market demand.

DECC will continue its Organics Market Development Program which will include projects such as: Cost Benefit in Agriculture; Catchment Rehabilitation trials; Parks and Gardens trials; Golf Courses and Turf applications; and Erosion Control on Highway Construction Projects. The program will also provide continued support for implementation of the Compost Australia Industry Roadmap.

DECC will also undertake programs to explore growing opportunities for more integrated systems to deal with organic materials in regional areas.

A new medium term goal of the organics program is to assist consideration by Councils and waste industry collectors of options and opportunities to collect food waste for recycling. DECC will discuss issues relating to food waste recovery with key industry organisations, local government and State government agencies. DECC will also provide information to assist decision making through publication of a review of collection and recovery schemes currently operating in Australia and overseas and publication of a triple bottom line assessment of the benefits and costs of adding food waste to household recycling schemes.

Household chemical wastes

The community has strongly supported opportunities to safely dispose of unwanted household chemicals and the current DECC program will continue in the medium term. However, an increased effort will be made to ensure that producers of major products and materials collected under the scheme provide additional support to the program.

At present, paints, oils and lead acid batteries comprise a substantial proportion (79%) of the materials collected, but these sectors currently make no physical or financial contribution to the running of the scheme. These sectors have been put on notice that this needs to change. The Household Chemical Collection scheme will also continue to be streamlined to ensure that the geographic coverage of collections is optimised and that the scheme delivers the best value for money. The DECC program for 2006–07 has provided collections for a total of 51 Councils in the Sydney Metropolitan Area and the Hunter, Central Coast and Illawarra regions. It continues to provide a hotline and website information on the handling and disposal of household chemicals.

VENM

Virgin Excavated Natural Materials (VENM) is usually generated through various types of excavation and construction works. The material is extremely useful and whilst there is some allowance for landfill operators to use limited quantities of VENM for operational purposes in managing the landfill (e.g., for roads and cell construction), VENM that is disposed of to landfill is subject to the waste disposal levy.

The new electronic waste data system (see section 1.1) has enabled DECC for the first time to specifically identify and aggregate total amounts of VENM being disposed of to landfill. The majority of this material is generated in the Sydney region and the total quantity being disposed is growing.

VENM represents a substantial opportunity for diversion and re-use. Future increases in the waste levy will provide a strong incentive to generators of VENM to identify projects that can re-use this material. DECC will also support these efforts by working with various government departments, including the Department of Planning to identify potential users such as new subdivisions and land releases and major infrastructure that may be able to use substantial quantities.

Product stewardship/extended producer responsibility programs

Focus for action

- *Work to deliver national systems for agreed wastes of concern*
- *Support and continued monitoring of progress of the National Packaging Covenant and enforcement action against non signatories*
- *Continued work with sectors identified as 'wastes of concern' in the NSW EPR Priority Statements*
- *Improved criteria and processes for identifying priority wastes*

Product stewardship will remain a major program focus in the coming years, either through a mix of voluntary, co-regulatory or mandated approaches. It is a key driver worldwide to ensure that producers take physical or financial responsibility for the environmental impacts of their products throughout the products' life cycle.

Given the nature of the demographics, markets and industry structure in Australia, programs will continue to give priority to national approaches based on collaboration and cooperation between governments and industry sectors. There will be increased levels of analysis of the relative costs and benefits of the various options for action (from voluntary through to fully mandated) to ensure that the approaches that are implemented deliver the best environmental, economic and social benefits. A continuing focus will also be needed on the provision of effective enforcement of regulatory safety nets or other mechanisms to ensure that companies participating voluntarily are not disadvantaged in the market place.

DECC will continue to support national processes aimed at achieving product stewardship outcomes for TVs, computers, tyres, plastic bags, mobile phones and packaging. Through the DECC, NSW is leading the EPHC work relating to electrical products. Work includes the development of regulatory impact statements and economic modelling relating to individual waste streams and the development of a generic National Environment Protection Measure (NEPM) as a co-regulatory safety net to underpin voluntary product stewardship schemes as they are developed by product sectors.

DECC will continue to support the EPR Expert Reference Group (ERG) appointed by the Minister to evaluate the performance of the 'wastes of concern' (currently 17) identified in annual EPR Priority Statements. There will also be a review of the current selection and evaluation criteria for wastes identified in annual statements, continued meetings with sectors, support for various sector initiatives, data collection, ongoing research into international models and experience and modelling of particular schemes proposed by industry.

Better knowledge and data

<u>Waste intelligence</u>

Focus for action

- *Improved electronic data system for reporting and analysing recycling data*
- *Improved process for annual reprocessor surveys*
- *New commercial and construction waste disposal audits*
- *Improved data and information on products identified as wastes of concern*

Waste intelligence and analysis programs will remain a key requirement to support waste reduction and resource recovery efforts in NSW. While the quality of reported waste data is improving, there are still substantial challenges relating to obtaining accurate data and reporting on recycling in some sectors.

Data on amounts of waste disposed of and recycled provides the basis for reporting and evaluating the performance of individual programs, sectors and waste streams as well as progress against the goals and targets in *Waste Strategy 2007*. The work involved in gathering this data includes the development and implementation of appropriate management systems for data, including the new Waste Data system introduced in 2005–06, reviewing measurement and collection methodologies and streamlining systems to minimise the work required from organisations providing the data.

Over the next three years, there will be further building on recent improvements to the range, representativeness and quality of data collected on waste related issues. This effort will be result in increased confidence in future data sets.

Annual data sets such as reprocessor data, council NEPM data, brand owner surveys, data required for annual reporting against the National Packaging Covenant and other product stewardship schemes and statewide litter counts will be maintained. Key data sets such as C&I and C&D landfill audits will be repeated at regular intervals.

New data collection and monitoring related to extended producer responsibility performance will become increasingly important. This will enable better measurement of the results and allow governments to evaluate programs and have confidence in the data used as the basis for negotiated performance outcomes and targets. Data required to monitor and measure product stewardship in many sectors is not readily available.

The DECC waste intelligence team will continue to refine the new electronic waste reporting database and develop improved ways for organisations to lodge the wide range of annual data collected to fulfil various reporting obligations. In response to concerns raised by users, a review will also be undertaken of existing waste audit methodologies, starting with the municipal and commercial methodologies. Major landfill audits are scheduled for 2007–08 (C&I) and 2008–09 (C&D).

Social research

Social research is another key source of information that helps build an understanding of the social dimension of environmental sustainability, particularly in relation to the barriers and opportunities for behaviour change.

DECC will continue to publish and disseminate its statewide triennial research survey, *Who Cares About the Environment?* The 2006 survey was released in late November[41]. As well as undertaking secondary analysis and providing tailored analysis on specific waste and resource recovery issues for stakeholders, DECC will continue to promote the use of social research to improve waste education programs by developing a guide to using research and conducting workshops and training.

[41] *Who Cares About the Environment (DEC 2006)*

Education

Focus for action

- *Helping all sectors understand the links between waste and other environmental issues and helping people to make positive changes in their lives*
- *Continue to support waste and sustainability educators throughout the community to promote positive environmental actions through training, resources, capacity building, research and partnerships.*
- *Continued focussed support for initiatives by ethnic communities, aboriginal communities and young people to promote action on waste and sustainability*

DECC's community education programs will continue to contribute to Government priority outcomes in the areas of waste and sustainable living by strengthening delivery across the system of environmental education, addressing specific waste education gaps and needs, and supporting integration of education in DECC waste programs as well as other parts of DECC.

The medium term strategy for education is to continue to build the capacity of the system of sustainability education and to conduct education programs on priority waste issues. Specific objectives of waste-related education programs between 2006 and 2009 will be to:

- raise the profile of education and its role in waste minimisation and management in industry, government and the broad community
- identify and promote leading practice education, including improved program design, measurement of outcomes and linking education on waste with other sustainability issues
- ensure continuity of waste education messages and
- promote knowledge and resource sharing by waste educators.

There will be a focus on improving understanding of the key factors that influence waste related knowledge and behaviour, and then developing program approaches that deliver the best results for each particular audience. These could include partnerships, education and training, and sustainability education behaviour change programs. Some of this work will include capacity building of DECC officers who have waste or material specific knowledge but are not familiar with the range of available educational tools.

Programs will promote improved waste education frameworks and practices through the development of guidelines and case studies, the provision of training, partnerships with local councils to deliver high quality sustainable living community education programs, and the funding of evidence-based council and community projects that rigorously research and report on behaviour-change outcomes.

Work with ethnic communities to deliver targeted sustainable living workshops and field trips will continue, as will work with councils and other organizations to build capacity to undertake ethnic communities education projects. This work will include the development of a Working with Ethnic Communities guideline, as well as associated training and network development.

Work will continue with Aboriginal communities to develop and pilot programs that address waste, litter and integrated sustainability outcomes.

The engagement of young people (those aged between 15 and 25) with environmental issues will be a particular focus and a forum is being established for environmental youth citizenship and leadership.

Waste avoidance

Strategies that encourage waste avoidance are generally part of integrated programs tackling broad waste related or sustainability issues. DECC programs that have a strong waste avoidance component include the business partnership programs that focus specifically on cleaner production or on tackling a range of sustainability issues. The Sustainability Compacts that have been negotiated with sector leaders such as Insurance Australia Group (IAG), Sensis and Hewlett Packard include waste avoidance goals and actions. For example, in its Compact with the NSW Government, Hewlett Packard has undertaken to deliver incremental landfill diversion targets at its NSW plants and facilities.

Other programs include work with sectors to implement product stewardship initiatives. Work with all sectors includes discussion about ways to improve the design of products to reduce the amount of resources used and to reduce waste and encourage recovery at end of life. A specific example is the requirement that was built into reporting requirements for National Packaging Covenant company signatories to provide details about how they have reduced use of feedstock inputs (including energy, water and raw materials).

DECC education programs such as the successful ethnic communities program and work to support School Environmental Management Plans also have a strong avoidance focus. The Government's WRAPP reporting also includes a requirement to report changes in total paper consumption and other efforts to avoid waste.

4.5 International and national targets

The *Waste Avoidance and Resource Recovery Act 2001* (sub-section 12(2)(a)) requires DECC to benchmark its waste strategy to international best practice. The DECC has reviewed targets adopted by European countries, the UK, the US, and Canada. The findings have been summarised in **Appendix 3**.

The review demonstrated that there continues to be wide variations in targets and approaches by countries or individual states, provinces or regions throughout the world, making it difficult to identify any particular set of targets or approaches as 'international best practice'. Nevertheless, the targets in *Waste Strategy 2007* for the increased recovery and recycling of municipal, C&I and C&D wastes to 66%, 63% and 76% respectively by 2014 are in line with the targets and aspirations in many of the countries that were surveyed.

For example:

- Canada – 50% landfill diversion target for all three waste streams;
- Denmark – 65% recycling target for C&I wastes and 64% for C&D wastes;
- EU – 65% landfill diversion target for municipal wastes;
- New Zealand – 60% diversion of municipal garden wastes from landfill; 50% recycling target for C&D wastes;
- UK – 15% landfill diversion target for C&I wastes; and 65% for municipal wastes; and
- US – 35% recycling target for municipal solid wastes.

In producing *Waste Strategy 2007*, DECC also reviewed targets, where they existed, of other Australian jurisdictions for the recovery and reuse of waste material from the municipal, C&I and C&D waste streams. The following table provides a comparison of NSW targets against those set by other States and Territories:

Comparison of NSW targets against targets set by other Australian jurisdictions

WASTE STREAM	NSW	VIC	SA	WA	ACT
Municipal	66% recovery by 2014	65% recovery by 2014	75% recovery (including food waste) by 2010	Recovery targets by 2015: Inert (mainly C&D) = 100% Organics (household and commercial) = 85% Recyclables (kerbside) = 100%	Zero waste by 2010
C&I	63% recovery by 2014	80% recovery by 2014	30% increase in recovery by 2010 (over 2004 tonnage)		
C&D	76% recovery by 2014	80% recovery by 2014	50% increase in recovery by 2010 (over 2004 tonnage)		

4.6 Monitoring and reporting future progress

DECC will publish progress reports on *Waste Strategy 2007* in accordance with the *Waste Avoidance and Resource Recovery Act 2001*. The next progress report is due in 2008. DECC will also continue to periodically review the NSW Waste Strategy as required under the Act.

Appendix 1 – Recent studies and research

Social research

- *New South Wales State of the Environment 2006*, DEC, December 2006
- *Who Cares about the Environment in 2006: A survey of NSW people's environmental knowledge, attitudes and behaviour*, DEC, November 2006
- *Educating the Community About Litter: Changing knowledge, attitudes and behaviour 2000 to 2003*, DEC, December 2005
- *Wasteful Consumption in Australia*, Australia Institute, March 2005
- *Illegal Dumping in NSW - Final Report*, DEC, February 2005 (unpublished)
- *NSW Litter Report 2004*, DEC, December 2004
- *The Environment and Ethnic Communities in 2004*, DEC, October 2004
- *An assessment of attitudes and behaviour amongst multi unit dwelling residents in relation to illegal dumping*, DEC, May 2004
- *Consumer Demand for Environmental Packaging: A report from a survey of NSW residents regarding the purchasing, use and disposal of packaging, Report prepared by the Taverner Research Group for Jurisdictional Recycling Group, January 2004*
- *Evaluation of the EPA's 'Tosser Campaign*, DEC, July 2003 (unpublished)
- *Optimising the Tosser 2 Campaign: Market and Consumer Insights,* DEC, March 2003 (unpublished)

Systems research (performance and benefits)

- Passive drainage and biofiltration of landfill gas using recycled materials. Report prepared by UNSW and GHD Pty Ltd, DEC, December 2006.
- *WRAPP Progress Report 2006*, DEC, September 2006
- *Cost/benefit of using recycled organics in council parks and gardens operations in NSW*. 2nd Edition, DEC, June 2006.
- *Recycled organics in mine site rehabilitation - review of the scientific literature*. Report prepared by the NSW Department of Primary Industries, DEC, June 2006.
- *Assessment of Garden Organics Collection Systems*, DEC, May 2006
- *Recycled organics in catchment management – final report*. Report prepared by the NSW Department of Primary Industries, DEC, September 2005
- *Recycled organics - on farm salinity trials*. Report prepared by EA Systems Pty Ltd, DEC, August 2005
- *Developing recycled organic products for use in viticulture*. Report prepared by Ecoresearch Pty Ltd, DEC, August 2005
- *Recycled organics in catchment management - review of the scientific literature*. Report prepared by the NSW Department of Primary Industries, DEC, August 2005
- *Benefits of Recycling,* DEC, May 2005
- *WRAPP Progress Report 2004*, DEC May 2005

- *Household Electrical and Electronic Waste Benchmark Survey*. Report prepared for DEC by Ipsos, March 2005.
- *NSW reprocessing industries survey 2003–04*, DEC, 2005
- *Recycle IT! Computer Collection Pilot Report*. DEC and the Australian Information Industry Association, October 2004
- *City to Soil*, DEC, July 2004
- *Analysis of markets for recycled organic products - report*. Report prepared by GHD Pty Ltd, DEC, June 2004
- *Assessment of domestic waste and recycling systems,* DEC, March 2004
- *Persistent herbicides risk management program*. Report prepared by the Recycled Organics Unit, UNSW, DEC, February 2004
- *Hunter Municipal Solid Waste Audit Report*, DEC, 2004 (unpublished)
- *Study on local government management costs for garden organics*. Report prepared by Anne Prince Consulting, DEC, December 2003
- *Life cycle inventory and life cycle assessment for windrow composting systems.* Report prepared by the Recycled Organics Unit, UNSW, DEC, October 2003
- *Electrical and Electronic Products - Infrastructure Facilitation*. Report prepared by Nolan-ITU for DEC and the Department of Environment and Heritage, September 2003.

Informational, guides, tools

- *NSW Government Waste Reduction and Purchasing Policy: Guidelines to assist reporting*, DEC, 4th Edition, January 2007
- *Preferred resource recovery practices by local councils*, DEC, March 2006
- *Learning for Sustainability 2007-2010*, DEC, October 2006
- *Getting more from our recycling systems: Good practice performance measures for kerbside recycling systems*, DEC, 2005
- *Getting more from our resource recovery systems: Model waste and recycling collection contract*, DEC, 2005
- *Better Practice Guide for Public Place Recycling*, DEC, May 2005
- *Report on the Mattress Industry of NSW*, DEC, 2004 (unpublished)
- *Waste and resource recovery – Service development timelines*, Dec, 2005
- *Good practice performance measures for kerbside recycling systems*, DEC, February 2004
- *Business Waste Survey*, DEC, 2003 (unpublished)
- *Herbicide risk management tools for the recycled organics industry*. Report prepared by the Recycled Organics Unit, UNSW, DEC, April 2003
- *Alternative Waste Technology (AWT) Assessment Manual and Tool*, DEC, 2003
- *The Buy Recycled Guide*, 3rd edition, Resource NSW, 2003
- *Hunter Region Recycling Directory*, Resource NSW, 2003

Appendix 2 – DECC programs and Strategy result areas

Program area	Project Name	Project contribution to Strategy result areas[42]			
		Waste avoidance	Increased recycling (and targets)	Reduced toxicity	Reduced litter and illegal dumping
Local Government	Improved practice resource recovery		■		
	Littering and Illegal dumping			□	■
	Local Government Buy recycled	■	■		
	Council Networks and Systems Development		■		
	Waste Not DCP		■		□
Resource Recovery	Away from Home		■		
	Commercial		■		
	Glass Fines		■		
	Timber		■		
RID Squads				□	■
Regional and Local Government Support			■	□	□
Specific Waste Streams	Household Chemical Collections			■	□
	Regional Household Chemical Collections			■	□
Education	OEILT Council Partnerships	□	□	□	
	Ethnic Communities Sustainable Living	□	□	□	□
	Children and Young People	□	□		□
	Waste Education Guidance	□	□	□	□
Business Partnerships	Business partnership programs	□	□	□	
	Business Sustainability	□	□		

[42] ■ shows primary project focus; □ shows secondary focus

Program area	Project Name	Project contribution to Strategy result areas[42]			
		Waste avoidance	Increased recycling (and targets)	Reduced toxicity	Reduced litter and illegal dumping
	Compacts				
	Education for Compliance			□	□
	Cleaner production for Licensed premises	□	□	□	
Organics	Catchment rehabilitation		■		
	Cost Benefit in Agriculture		■		
	Compost promotion		■		
	Food waste		■		
	Council parks and gardens		■		
	Compost Australia – Roadmap		■		
	Recycled organics Unit				
	Trial Sites		■		
	Recycled Organics in stormwater		■		
Government	Waste Reduction And Purchasing Policy (WRAPP)	□	■		
Product Stewardship	National Packaging Covenant	□	■		□
	Product specific projects		■	□	

Appendix 3 – International targets

Country / region	Waste stream	Targets	Method	Remarks
Canada	Municipal, C&I and C&D	50% reduction in disposal rates by December 2000 (using 1989 as base year)	Not known	Most provincial governments have launched their own programs to achieve this goal. Nova Scotia reports exceeding the target but Ontario reported a diversion rate of only 28%. Ontario has set a new goal for diversion of waste from disposal being 60% by 2008.
Denmark	C&I	65% recycling of waste from industry by 2004	Not known	In 2003, 60% of the waste from this sector was recycled. In recent years, the recycling rate has been around 62%.
Denmark	C&D	Attain 64% recycling rate of C&D Waste by 2004	Not known	Denmark has exceeded its target for 2004 with 94% of C&D waste recycled.
Denmark	C&D	90% reduction in C&D waste generation by 2004	Not known	Target appears not to have been achieved. C&D waste generation has increased every year from 1994 to 2004.
EU	Municipal	Landfill Directive for member countries to reduce amount of biodegradable municipal waste going to landfill to 75% of 1995 level by 2006 to 50% of 1995 level by 2009 to 35% of 1995 level by 2016	Legislation	The EU landfill directive sets landfill reduction targets leaving the choice of instruments to member states. For the 2006 target only 12 of the 25 member states submitted their national strategies for the landfill directives.
EU	Tyres	Ban on landfilling whole tyres by 2003 Ban on landfilling shredded tyres by 2006	Legislation	
France	Municipal, C&I and C&D	By 2002 only non-reusable, non-recyclable and non-dangerous waste can be disposed of to landfill	Legislation	No information available on whether target was achieved
Germany	Municipal, C&I and C&D	Ban on landfilling of inadequately pre-treated wastes from June 2005	Legislation	No information available on whether target was achieved
Italy	Municipal, C&I and C&D	35% of all waste materials to be segregated and collected separately by law by 2003	Legislation	It appears that Italy has met, or has come close to meeting its target. Waste to landfill has decreased from 77% in 1997 to 60% in 2003

Country / region	Waste stream	Targets	Method	Remarks
New Zealand	C&I	10 major businesses to be participating in waste minimisation programs by December 2005	Voluntary	Several private sector initiatives and a draft report by Ministry suggest that this target might have been met
New Zealand	Municipal and C&I	Eight businesses in different sectors will have introduced extended producer responsibility pilot programs by December 2005	Voluntary	Target appears to have been met: About 200 signatories have signed the revised New Zealand Packaging Accord. Industry has also initiated EPR programs for oil, whitegoods, mobile phones and electronic equipment.
New Zealand	Municipal	By December 2005, - 60% of garden wastes to be diverted from landfill and beneficially used. - 95% diversion of commercial organic wastes from landfill to beneficial use.	Not known	The targets appear to have not been met due to lack of end-markets as well as insufficient collection systems and public information infrastructure. Also, commercial organic wastes had required more closely controlled processing.
New Zealand	Hazardous wastes	20% increase in recovery and recycling rates for priority hazardous waste by December 2012	Legislation	Yet to be assessed.
New Zealand	C&D	50% reduction of C&D waste to landfill by December 2005.	Not known	Target appears to have been met.
Spain	Municipal	6% reduction in municipal waste by 2002 based on 1997 levels	Not known	Target appears to not have been achieved: Reports indicate that from 1999 to 2001 municipal waste in Spain increased by about 7%
Sweden	Municipal	The quantity of landfilled waste to be reduced by at least 50% by 2005 compared to 1994 levels.	Legislation	Target appears to have been met. Sweden reportedly recycles over 40% of municipal waste with incineration levels remaining constant at 40%. In 2004 the share of waste being landfilled was under 10%.
UK	C&I	To reduce by 2005 the amount of C&I waste sent to landfill to 85% of that landfilled in 1998.	Not known	Target appears to have been met by 2003. C&I waste to landfill decreased from 32.1Mt in 1998 to 27.7Mt in 2002/03.
UK	Municipal	Reduce biodegradable municipal waste landfilled to 75% of 1995 level by 2010 to 50% of 1995 level by 2013 to 35% of 1995 level by 2020	Voluntary	Yet to be assessed.

Country / region	Waste stream	Targets	Method	Remarks
UK	Municipal	To recycle or compost: at least 25% of household waste by 2005 At least 30% of household waste by 2010 At least 33% of household waste by 2015	Legislation	UK appears to be near target. 2004/05 unaudited figures show that English households recycled more than a fifth of their waste, (~ 23%).
US	Municipal	To recycle 35% of municipal solid waste by 2005	Not known	Figures leading up to 2005 show the US recycled 27% of its municipal waste - a decline from previous years, which were typically about 30%). When combined with incineration figures the numbers are close to 35%.
State of California, US	Municipal, C&I and C&D	50% diversion of waste from landfill by December 2000	Not known	Target was close to being met. California reported an overall diversion rate of 42% in 2000 and 48% in 2002.
State of Minnesota, US	Municipal	Eliminate landfilling of all unprocessed municipal waste by 2008	Not known	Yet to be assessed.

Department of **Environment & Climate Change** NSW