

Waste Avoidance and Resource Recovery in NSW

A Progress Report

2004



Department of
Environment and Conservation (NSW)



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WASTE AVOIDANCE AND RESOURCE RECOVERY IN NSW – A PROGRESS REPORT

This Report has been prepared by the Department of Environment and Conservation (NSW) to provide the community with an update on our progress in tackling waste and litter in NSW. It also provides information on the implementation of key actions identified in the NSW Waste Avoidance and Resource Recovery Strategy 2003 (the Strategy), as required under the Waste Avoidance and Resource Recovery Act 2001 as well as priorities for action over the next 12 months.

Overview

In broad summary, good progress was made during 2003 and most of the commitments made in the Strategy will be delivered by mid 2004.

The data picture at a glance...

Comparing the most recent 2002-03 data on waste with the baseline 2000 data used in the Strategy shows:

- A 7% reduction in the amount of waste disposed of in the Sydney region (SMA), due largely to a reduction in the amount of commercial and industrial waste disposed of;
- Total waste disposed of in the Hunter, Central Coast and Illawarra regions has increased by 8.8% since 2000;
- Combining data for the Sydney region and the Hunter, Central Coast and Illawarra regions, there has been a 4% reduction in total waste disposed of to landfill;
- The amount of rural municipal waste has remained constant at around 500,000 tonnes;
- Total waste in the rural sector, including C&I and C&D waste is now approximately 1 million tonnes per year;
- Overall organics recovery is estimated to have increased from 40% of total generated in 1998 to 50% in 2002-03;
- Household recycling performance has improved, principally through increased paper recovery with each person in Sydney now setting aside 91.4kg for recycling (excluding garden organics), compared with 84kg in 2000;
- The diversion of garden organics from landfill through kerbside recycling systems in Sydney has boosted recovery from the municipal waste stream by a further 33.5 kg per year bringing total recovery from households to 125 kg per year;
- 95% of NSW households have access to kerbside recycling.

The continuing challenges...

Engaging people to take action to avoid waste is an ongoing challenge because people aren't sure about exactly what they can do to contribute. And, despite our relative familiarity with recycling, the commercial and industrial waste audit has shown great scope for much better recycling from business and industry. Action is particularly needed to recover large amounts of paper, cardboard and wood that are still being thrown away. There are also many businesses which still do not have regular recycling collections suggesting a significant opportunity to increase recovery rates.

Over the next 12 months, serious effort is also needed to increase recovery of products made by the 16 sectors identified in the Extended Producer Responsibility (EPR) Priority Statement released by the Government in March 2004. A number of sectors are working at a national level, including TVs, tyres, packaging, agricultural and veterinary chemicals and containers, computers and mobile phone batteries. Serious progress will need to be made to avoid consideration of a regulatory approach in NSW.

Program highlights...

Some program highlights and specific waste reduction and resource recovery achievements over the past 12 months are included below:

- A Wood Waste Recovery Network is diverting over 40,000 tonnes of wood per annum from landfill with potential for substantially increased quantities;
- Fifty seven tonnes of computer equipment (more than 6,000 items) were collected over a 4 month period in Western Sydney in a partnership pilot with the computer industry;
- Retail, commercial and accommodation sector partnerships programs are currently diverting almost 3,000 tonnes per annum from landfill with a commitment to increase diversion rates of 45% to 65% of total waste across 18 major commercial sites;
- A major audit of C&I waste to landfill has driven the establishment of partnership programs with major waste infrastructure operators which are targeting 20,000 tonnes per annum additional recovery of cardboard, metal and wood using low tech/low cost recovery systems;
- A Local Government Reference Group has prepared a draft Local Government Consultation Paper establishing opportunities, targets and commitments which Local Councils might implement over the next 10 years to contribute to the Strategy targets. Targets and commitments will be presented to the NSW Local Government Association and NSW Shires Association Executive for endorsement;
- Design guidelines to promote the use of recycled organics in residential property construction have been developed in partnership with Landcom, with initial estimates that 4,500 tonnes of recycled organics could be used in the construction of 1,300 homes in Western Sydney. Similar guidelines are being developed with the RTA to use recycled organics in roadside landscaping;
- New and increased commercial recycling services have been developed in the Illawarra as a result of the Illawarra Commercial Premises Recycling program. Additional volumes of materials being collected include:

Cardboard	93,250 cubic metres pa
Glass	1,200 cubic metres pa
Commingled recycle materials	8,600 cubic metres pa
- Substantial support provided by the Department of Environment and Conservation (NSW) to the Hunter Integrated Resource Recovery program will divert 130,000 tpa or 68% of waste from landfill once established;

- A Local Government Buy Recycled Alliance has been established through a partnership between the Department of Environment and Conservation (NSW) and the Local Government Association and Shires Association of NSW;
- Setting a model for future conferences and events, the first ever Waste Wise Local Government Association of NSW Annual Conference was successfully held in Albury in November 2003 attended by 750 delegates representing 87 Councils;
- A partnership between the Department of Environment and Conservation (NSW) and the Department of Education and Training is providing 27 support team members state wide to work with 200 schools initially to develop and implement School Environmental Management Plans. The program is also supported by a cross agency network of 25 departments;
- A bilingual education team of 15 educators across 7 languages is implementing programs throughout Sydney to promote sustainable living practices. Since June 2002, educators have held more than 450 sessions reaching over 9,000 participants from more than 150 community groups around the Sydney metro region;
- Twenty-seven vineyards throughout NSW have provided written commitment to a research and development project to increase the use of recycled organics in viticulture;
- The Department of Environment and Conservation (NSW) has completed the first major audit of commercial and industrial waste to landfill since 1997 involving sixteen Sydney landfills and transfer stations and one landfill in the Hunter;
- Collection of life cycle Inventory Data and a full Life Cycle Analysis for recycled organics from windrow composting has confirmed the environmental benefit of collection, processing and application of source separated garden organics providing an important tool for policy and integrated waste management decisions as well as marketing recycled organics;
- The environmental knowledge, attitudes and behaviours of non-English speaking people from ethnic communities in NSW are being researched in a joint project between the Department of Environment and Conservation (former EPA, RNSW and NPWS), Sydney Catchment Authority and SEDA;
- A decision making tool and tailored training program have been developed to support Local Government to assess proposals for Alternative Waste Treatment Technologies;
- Good practice performance measures for kerbside recycling systems have been developed alongside a comparative assessment of current household waste and recycling systems providing valuable evaluation and management support for Councils.

PART 1. PROGRESS ON KEY COMMITMENTS MADE IN THE STRATEGY

The Strategy provided commitments to some key actions. These are described below, along with details of progress in their delivery. The Strategy also established a number of key targets. These are listed in Appendix 1 and current data that provides an insight into progress against these is discussed in Part 2.

Produce a Strategy Implementation and Progress report

(including programs, outcomes, priorities and responsibilities). This Report has been prepared to deliver this commitment.

Develop a Waste Prevention Strategy

The Information Paper “Producing and Consuming Efficiently to Conserve our Resources” released in March 2004 delivers on this commitment. The Department of Environment and Conservation (NSW) will engage key groups during 2004 to further discuss the issues it raises and the actions it promotes. The results of discussions will be incorporated as part of the first bi-annual review of the Waste Avoidance and Resource Recovery Strategy, commencing at the end of 2004.

Establish a Litter & Illegal Dumping Alliance

A model for the Alliance has been developed and incorporates feedback from the Department of Environment and Conservation (NSW)’s cross sectoral Litter Reference Group and the former Resource NSW Board. The first meeting of the new cross sectoral Alliance is scheduled for later this year. A draft framework document is currently being finalised for consideration by the Alliance to provide a review on programs and achievements to date as well as potential areas for future action.

Establish a cross sectoral steering group and research/process to identify priority harmful substances

A research/background paper was completed in November 2003. The Expert Reference Group formed to advise and monitor sectors identified in the EPR Priority Statement will be involved in progressing the issue of reducing toxicity in products with those sectors nominated in the current Priority Statement.

Establish a coordinated, statewide waste education strategy

This is substantially completed and has involved widespread consultation and input from an expert steering group and practitioners during late 2003. It will be completed by mid 2004 and will establish what good practice waste education looks like, covering planning, implementation and evaluation. It will also provide guidance and resources for improving current practice.

Establish better data

The Department of Environment and Conservation (NSW) has recently undertaken a major audit of commercial and industrial waste being disposed of to landfill; a similar audit of construction waste will be undertaken in mid 2004. These surveys are providing valuable data on waste tonnages and composition and a basis for future program planning. The Department has also been working with the Department of Local Government to develop a more comprehensive and streamlined data collection system for Local Councils and is undertaking a major re-vamp of its section 88 levy system to enable electronic lodgement of data and an increased ability to manipulate this data. The Department has also commenced an annual Reprocessor Survey to establish tonnages being recycled within NSW. This is now in its second year and is providing solid baseline data of key materials being recycled in NSW.

PART 2. CURRENT PERFORMANCE DATA, PROGRESS AND CHANGES BEING OBSERVED

This Section has gathered together available data from a wide range of sources in an attempt to provide a comprehensive picture of current available data on waste, resource recovery, litter and illegal dumping. It describes trends and progress against established benchmarks and identifies new benchmarks which have been established. It also describes major findings from new social research conducted during 2004. Further detail on a number of the programs underpinning the data is included in Part 3.

Submission of additional NSW specific data from other sources is welcomed and will be included in future reports.

Waste disposal

Based on data for 2002-03, overall, the amount of waste disposed of across the state has remained constant at around 6 million tonnes.

Total waste disposed in the Sydney Region (SMA) is significantly less than reported in the Strategy which was based on 2000 data. In 2002-03 total waste disposed of in the Sydney region was down to 4.15 million tonnes representing a 7% reduction. It should be noted that this is not an exact comparison since the 2000 baseline figure of 4.44 million tonnes was based on the calendar year reporting and these have now been re-aligned as financial year data. More accuracy will be provided by back-calculating the 2000-01 financial year data later this year. However, these results are encouraging.

The reduction in waste disposal since 2000 can mainly be attributed to a reduction in the amount of commercial and industrial waste, particularly between 2000 and 2001-02. It should also be remembered that 2000 was the Olympics year which undoubtedly influenced total waste generation. Table 1 provides further details on annual tonnages and waste streams for the Sydney region.

Total waste disposed in the Hunter, Central Coast and Illawarra regions (ERA) has increased by 8.8% since 2000 (Table 2). This is likely to be a result of an increase in C&D waste caused by increased activity across the construction industry in these growth regions.

Overall, combining the Sydney region and the Hunter, Central Coast and Illawarra regions, there was a reduction in the total waste to landfill of 4% between 2000 and 2002-03 (Table 3).

Inconsistent reporting of waste disposal outside the SMA and ERA makes it difficult to determine overall trends for the state. The Department of Local Government surveys for 2000-01 to 2002-03 indicate that total rural municipal waste disposed of has remained constant at around 500,000 tonnes. When extrapolated to include commercial and construction waste the overall waste disposed in the rural sector is around 1 million tonnes per year.

Table 1: Waste Disposed by Waste Stream in Sydney Metropolitan Region (SMA), 2000 to 2002-03

Year	Municipal <i>tonnes</i>	C&I <i>tonnes</i>	C&D <i>tonnes</i>	TOTAL <i>tonnes</i>	Change <i>since 2000-01</i>
2000 ¹	1,334,756	2,170,236	941,289	4,446,281	
2001-02 ²	1,252,903	1,828,714	951,147	4,032,764	-9.3%
2002-03 ³	1,191,275	1,991,781	967,531	4,150,588	-6.7%

Table 2: Waste Disposed by Waste Stream in Extended Regulated Region (ERA), 2000 to 2002-03

Year	Municipal <i>tonnes</i>	C&I <i>tonnes</i>	C&D <i>tonnes</i>	TOTAL <i>tonnes</i>	Change <i>since 2000</i>
2000	438,986	349,312	183,662	971,959	
2001-02	442,352	349,797	167,367	959,516	-1.3%
2002-03	465,836	366,344	225,701	1,057,881	+8.8%

Table 3: Total Waste Disposed by Waste Stream in Greater Sydney Region (GSR), 2000 to 2002-03

Year	Municipal <i>tonnes</i>	C&I <i>tonnes</i>	C&D <i>tonnes</i>	TOTAL <i>tonnes</i>	Change <i>since 2000</i>
2000	1,773,742	2,519,548	1,124,951	5,418,240	
2001-02	1,695,255	2,178,511	1,118,513	4,992,280	-7.9%
2002-03	1,657,111	2,358,125	1,193,233	5,208,469	-3.9%

¹ EPA 2002 – S88 landfill reports. Total waste disposed in the Sydney Metropolitan Area at levy paying facilities for 2000. The data is compiled from the Waste Contribution Monthly Reports and assumes all claims for exemptions and rebates are approved. Source of all data for tables 1-5

² NSW DEC 2004a ; source of all data in tables 1-5

³ NSW DEC 2004a; source of all data in tables 1-5

Performance of different waste streams

The municipal waste stream remained stable between 2000 and 2002-03, contributing around 32% of the total waste for the Greater Sydney Region (SMA and ERA), while the contribution of both commercial & industrial and the construction & demolition sectors have also remained constant at around 45% and 23% respectively (Table 4).

Table 4: % Total Waste Disposed by Waste Stream in GSR, 2000 to 2002-03

Year	Municipal %	C&I %	C&D %
2000	33	47	21
2001-02	34	44	22
2002-03	32	45	23

Per capita municipal waste disposal levels in the Greater Sydney Region have steadily decreased to around 330 kilograms per capita per year (kg/c/yr). Overall waste disposal has fallen by 6.5% to around 1000 kg per capita per year (Table 5).

Table 5: Per Capita Total Waste Disposed by Waste Stream in GSR, 2000 to 2002-03

Year	Municipal <i>tonnes per capita</i>	C&I <i>tonnes per capita</i>	C&D <i>tonnes per capita</i>	TOTAL <i>tonnes per capita</i>
2000	368	523	232	1,124
2001-02	345	444	228	1,017
2002-03	334	476	241	1,051

Commercial & Industrial waste

In the largest audit program of its type undertaken in Australia, during 2003, the Department of Environment and Conservation (NSW) undertook a disposal-based audit of 14,000 tonnes of commercial and industrial waste disposed of to 16 landfill facilities and transfer stations in the Sydney Metropolitan Area and one landfill located in the lower Hunter.

The audit showed that a substantial amount of clean, dry cardboard is still being landfilled. At some facilities this is as high as 20% of total waste by volume. Substantial quantities of wood in the form of solid pieces, lengths, planks and poles are also being landfilled, particularly wooden pallets. While plastic is a major category by volume, this is made up of a wide range of polymers in a plethora of forms and products. The major component is plastic film in the form of shrink wrap and other sheet films.

More work is needed to identify the composition and opportunities for recovery of waste disposed of in garbage bags, which also constitutes a significant proportion of the total. Only small amounts of materials in the 'hazardous', 'computers/office equipment', 'rubber', and 'glass' categories were identified. Relatively little metal appears to be sent to landfill and little free paper or food and garden organics.

Figure 1 Composition by weight of commercial waste to landfill in the SMA⁴

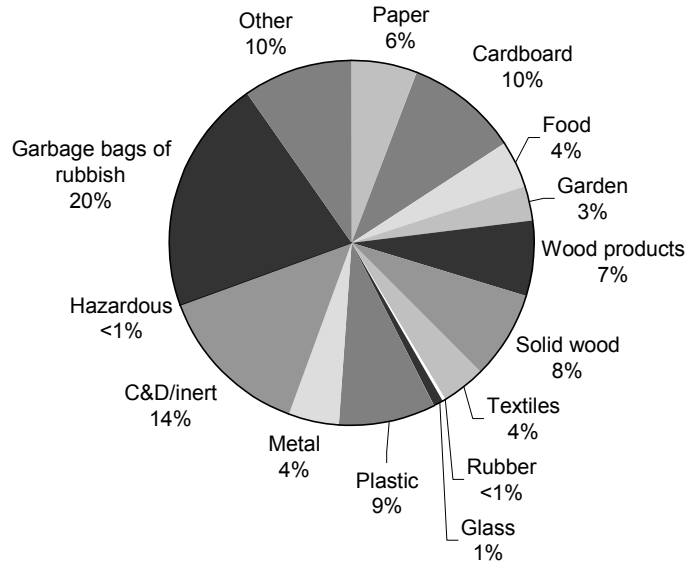
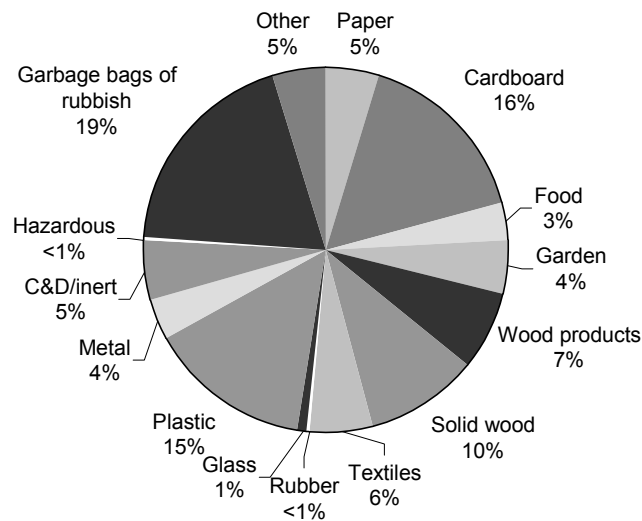


Figure 2 Composition by volume of commercial waste to landfill in the SMA⁵



Recycling performance

Recovery from households

In 2001-02, data indicated that almost nine out of ten NSW households (89%) were within a Council area where a kerbside recycling service was provided. The average participation rate in household kerbside recycling was 78%.⁶ In 2002-2003 the average participation rate in household kerbside recycling was 80%⁷ with 95%⁸ of households having access to a kerbside recycling service.

⁴ Department of Environment and Conservation Commercial and Industrial Waste Landfill Audit 2003

⁵ Department of Environment and Conservation Commercial and Industrial Waste Landfill Audit 2003

⁶ NEPC Annual Report 2001-02. pp 207-209

⁷ NEPC Annual Report 2002-03 pp 207-209

⁸ National Environment Protection Council Annual Report 2002 –2003, pp 207

Kerbside collection of domestic recycling materials in Sydney has been stable relative to economic activity since 1994, following a substantial increase between 1991 and 1994. Kerbside recycling collections of dry recyclables currently recover about 20% of domestic waste generated in the Sydney metropolitan area compared with 8% in 1991.⁹ There is a big difference in recovery rates across Sydney with Council recycling rates varying between 12% and 40%.¹⁰ In 2002-03 kerbside recycling collections recovered 22% of domestic waste generated in the Sydney Region¹¹. Recovery rates ranged from 7% to 41%.

Paper accounts for about two-thirds of kerbside materials collected by weight, glass around 28%, plastic 6%, steel 1% and aluminium cans less than 1%. In 2000, each person in Sydney set aside approximately 84 kilograms for recycling, compared with just 30 kg in 1991. Each person's annual contribution in 2000 was on average:

- 54 kg of paper;
- 24 kg of glass containers;
- 5 kg of plastic containers;
- 1 kg of steel cans; and
- Less than 1 kg of aluminium cans¹².

By 2002-03, this performance had improved, principally through increased paper recovery with each person in Sydney setting aside 91.4kg for recycling made up of:

- 62.3 kg of paper;
- 22.2 kg of glass containers;
- 4.8 kg of plastic containers;
- 1.7 kg of steel cans; and
- less than 1 kg of aluminum cans¹³

Garden Organics diverted from landfill by kerbside recycling systems in the Sydney Region during 2002-03 accounted for a further 124,000 tonnes. This material was either processed by commercial reprocessing facilities or on site Council facilities at landfills. This has boosted the recovery of municipal waste in the Sydney region by a further 33.5 kg per capita per year increasing the total recovery to 125kg per capita or 26% of the overall Municipal waste generation.

Organics recovery

Assembling meaningful data for organics is difficult since old and new data are often not directly comparable making it hard to draw conclusions about progress.

Section 88 landfill reports for 2002-03 indicate that of the 239,000 tonnes of garden and vegetation waste taken to disposal facilities in the SMA/ERA only 24,000 tonnes of this went to landfill. The remaining 215,000 tonnes were reused or recycled¹⁴, either by commercial or Council operated reprocessing facilities.

To gain a more complete picture the Department of Environment and Conservation (NSW) undertook a survey of facilities processing segregated garden organics. The 2003 Reprocessors survey¹⁵ covered facilities other than those operated by Councils. This has identified that in addition to the 215,000 tonnes of garden organics recycled

⁹ National Environment Protection Council Annual Report 2002 –2003, pp 207

¹⁰ Wright 2002.

¹¹ DLG Annual Survey 2002-3, NSW EPA (data sheets only)

¹² NSW EPA 2001b.

¹³ 2002-03 NEPM data (data sheet only)

¹⁴ NSW DEC 2004a

¹⁵ NSW DEC 2004c – NSW Reprocessing Industry Survey 2001-2002 and 2002-03

from disposal facilities a further 335,000 tonnes (excluding wood and timber) were processed within the SMA/ERA. This material was sourced directly by those facilities from all three waste streams.

An analysis of landfill audits estimated that a further 590,000 tonnes of garden organics were disposed of in the mixed waste stream during 2002-03 resulting in a total generation of garden organics in the SMA/ERA of about 1.14 million tonnes. This would indicate that 48% of garden organics, excluding wood and timber, was recovered across the Sydney, Hunter, Central Coast and Illawarra regions.

The Reprocessors survey also identified that an additional 86,000 tonnes of untreated wood and timber were being recycled within the SMA/ERA¹⁶ bringing the total amount of garden organics, wood and timber recovered to 635,000 tonnes or 50%.

A further 99,000 tonnes of garden organics were processed outside of the Sydney, Central Coast, Hunter and Illawarra regions¹⁷.

As a comparison, the State of the Environment Report 2000 stated that 680,000 tonnes of garden organics were generated in the Sydney region in 1998 and of this, 270,000 tonnes (almost 40%) was recycled.¹⁸ This was based on a study by Nolan ITU Pty Ltd¹⁹, and included garden organics and non-treated timber disposed of and diverted from landfill but did not include tonnages received directly at processing operations (such as composters).

The data indicates that although the total generation of garden organics, wood and timber is increasing it remains stable on a per capita basis at around 130 kg/c/yr. Great gains have been made in the diversion of garden organics from landfill as shown in Table 8 below. This data will be updated annually.

Table 6: Garden organics Landfilled and Recycled in the SMA/ERA

Year	Landfilled Garden Organics			Recycled Garden Organics			Total Gen. (tonne/yr)	Recovery %
	Municipal	C&I and C&D	Subtotal	Municipal	C&I and C&D	Subtotal		
1996(a)	309,000	108,000	507,000	112,000	20,000	132,000	639,000	19
1998(a)	308,000	103,000	411,000	209,000	60,000	269,000	680,000	40
2002-03	477,000	113,000	590,000	360,000	190,000	550,000(b)	1,140,000	48
						86,000(c)	1,224,000	50

- (a) Nolan 1999 (includes untreated wood wastes)
- (b) DEC NSW Reprocessing Industry Survey 2001-2002 and 2002-03 – Non-Council facilities (wood and timber excluded)
- (c) DEC NSW Reprocessing Industry Survey 2001-2002 and 2002-03 – Non-Council facilities (wood and timber only)

¹⁶ NSW DEC 2004b - Draft Summary Organics Processing in NSW 2002/03 (data sheet only)

¹⁷ NSW DEC 2004c – NSW Reprocessing Industry Survey 2001-2002 and 2002-03

¹⁸ NSW EPA 2000b

¹⁹ Nolan ITU 1999 – Green Waste Market Development Program March 1999

Seventy-one Councils in NSW offer regular organics collections, covering more than 520,000 residences. Forty-eight of these are either weekly or fortnightly services, mainly with separate mobile garbage bins, with the remainder mostly on call, quarterly or annually.²⁰

Table 7: Increase in municipal collection services over the past 7 years

	1996	1998	2002-03
Council kerbside organics collection services in GSR	30	31	43
Council kerbside organics collection services outside GSR			28

Construction and Demolition waste

The 2003 Reprocessors survey of the construction industry identified that recovery of C&D waste in the Sydney region (SMA) was approximately 2.5 million tonnes, or 70% of the total generation. This data indicates a significant increase on previous estimates and is most probably a result of off-site reprocessing of concrete and brick from major demolitions. Much of this material is being diverted into higher quality road making material.

Other major findings of the survey were:

- 1.3 million tonnes of concrete were recycled in the 2002-03 financial year; &
- reprocessors reported 900,000 tonnes of "other" materials comprising 610,000 tonnes of brick/terracotta, 70,000 tonnes of concrete/brick and 160,000 tonnes of asphalt were reprocessed off-site in the SMA in 2002-03.

A key factor, which has increased the diversion of bricks by 500,000 tonnes, is the incorporation of bricks recovered from deconstruction works within the *Specification for Supply of Recycled Material for Pavements, Earthworks and Drainage (the Greenspec)*. Bricks are now regarded as a valuable component of some road bases, rather than being seen as a contaminant, as was previously the case. The "Greenspec" was a partnership program involving the Department of Environment and Conservation (NSW), C&D reprocessors and the Institute of Public Works Engineering of Australia (IPWEA), representing Local Government professional engineers.

Government Agency waste reduction, recycling and purchasing

There has been some good progress made by government agencies in implementing their waste reduction and purchasing plans over the past two years. Based on reporting from 100% of agencies, there has been a substantial increase in the purchase of recycled content copy paper. The amount of paper purchased has remained stable whilst copy paper containing recycled content has doubled to 36%. The total waste paper recycled has remained stable at around 61%; recovery of office paper has increased by 10% to 78% of office paper generated. However, total tonnes of paper generated have increased by 1000 tonnes since 2001 to 21,944 tonnes.

There has been a substantial decrease in the number of toner cartridges recycled, with total numbers dropping by almost half to only 42%. Anecdotally, it appears that there has been some instability in the collection services for used cartridges in the past few years with some businesses and charities either entering or leaving the market, making collections unreliable. This may account for some agencies stopping use of recycling collection services.

²⁰ DLG Council Comparative Information 2002-03

Recovery of construction and demolition materials has remained fairly stable with 73% of the 3.1 million tonnes generated being recycled. There has been an increase of 4,000 tonnes in the total vegetation waste generated to 81,310 tonnes in 2003. Of this, 81% of the vegetation waste was recycled, a slight drop from the 88% reported in 2001.

A number of initiatives are supporting agencies to better monitor their recycling and purchasing performance. For example, the Department of Commerce has introduced a new and improved state-wide recycling collection contract for use by agencies. The contract expands the range of materials previously collected and both this contract and a proposed new stationery contract include provisions for suppliers to provide each agency with data for reporting its progress.

Tonnages reprocessed in NSW – A new data set

With limited data available about the types and volumes of recyclables being reprocessed, and available markets, a new survey of the NSW reprocessing industry commenced in 2001-02 and will be repeated annually. The response rate to the first survey varied across different materials and it was only possible to draw limited conclusions. However, results were encouraging as it would appear that large amounts of paper, glass and textiles were being reprocessed including 697,000 tonnes of paper/ cardboard, 108,000 tonnes of glass and 1,837 tonnes of textiles. Information provided through this initial survey has enabled the Department of Environment and Conservation (NSW) to establish benchmark data for comparative analysis for future surveys.

Response to the 2002-03 survey was much better. Analysis of data gathered in this survey indicated that 5.6 million tonnes of collected recyclables were reprocessed in NSW. The data shows that the amount of glass being reprocessed has remained constant and that there has been an increase in both paper and textile reprocessing since the previous survey. However this may also reflect an improvement in the reporting technique and will be monitored over time.

Good baseline data is now available for all materials although it should be emphasised that the data provided in this survey is unaudited. The Department will continue to monitor and explore ways to improve the quality of the data received with survey participants.

Table 8: Recyclables collected and reprocessed in NSW 2002-03

	Material Collected for Recycling by reprocessors	Material Recycled	Disposed of due to contamination or residual reprocessing waste
Building	3,054,447	2,901,074	85,911
Organics	1,159,618	1,131,048	2,670
Metals	1,091,928	1,037,377	1,281
Paper	864,985	753,964	48,135
Glass	111,371	107,377	195
Rubber	9,977	5,970	5,980
Textiles	2,189	1,963	83
TOTAL	6,294,515	5,185,563	114,255

Waste Generation

A number of assumptions have been used to calculate the data in this new data set and the Department of Environment and Conservation will ensure that these are applied consistently in future to provide an ongoing picture of performance. It is anticipated that our ability to measure waste generation will improve as our data improves.

Data in this section is based on an extensive analysis of landfill disposal data, kerbside recycling data and information received from recyclers and reprocessors through the 2002-03 Reprocessors survey. This has provided a useful overview of overall waste generation throughout NSW and in particular the Sydney Region (SMA). Recycling figures differ to those reported in the Reprocessors survey as the figures include all sources of recycling, not specifically commercial reprocessors.

The analysis does not catch every possible material, especially those avoided by on-site composting, reprocessing or reuse. On a state wide basis, the analysis suggests that 48% of NSW's waste generation of around 12 million tonnes is recovered through various recycling and reprocessing systems.

Table 9: Total waste generation by Waste Stream for NSW - 2002-03

	Municipal		C&I		C&D		Total Tonnes	Recovery %
	Disposed	Recycled	Disposed	Recycled	Disposed	Recycled		
Paper & Cardboard	264500	336500	453500	427500	5000	0	1487000	51%
Plastic	114000	24500	283500	34500	12500	0	469000	13%
Glass	81000	126000	28000	45000	0	0	280000	61%
Ferrous	42000	15000	85000	500000	55000	500000	1197000	85%
Garden Organics	629500	650500	85000	191500	21000	0	1577500	53%
Food	637000	0	113500	45500	0	0	796000	6%
Timber			198500	48500	116500	82500	446000	29%
Soil/Rubble ^(a)					520500	956000	1476500	65%
Concrete					465500	1451000	1916500	76%
Other recyclables ^(b)	7000	4000	28000	72000	32000	319000	462000	85%
Other (waste) ^(c)	395000	0	1558000	0	112000	0	2065000	
Total	2170000	1155500	2831000	1364500	1340000	3308500	12172500	48%

- (a) Soil/Rubble is considered to comprises soil/rubble, soil, terracotta, asphalt, sandstone & sand, and concrete/brick
- (b) Recyclables comprises Aluminium and other non-ferrous metals, liquid paperboard, mixed hardcore C&D waste, and Other C&D waste.
- (c) For Municipal and C&I Other waste comprises mixed and contaminated waste not suitable for recycling. For C&D Other waste also comprises Asbestos and Contaminated soil.

For the Sydney Region (SMA) recovery is slightly higher at 53% of the total generation of around 8.8 million tonnes. This is around 2 million tonnes higher than reported in the Strategy²¹. However, it should be noted that the previous attempt to quantify Sydney's total waste generation acknowledged limitations in the available data which greatly underestimated the amount of reprocessing for several materials, particularly ferrous metal recycling from the commercial & industrial sector and garden organics from all waste streams.

²¹ Wright June 2002

Table 10: Total waste generation by Waste Stream for Sydney (SMA) - 2002-03

	Municipal		C&I		C&D		Total	Recovery
	Disposed	Recycled	Disposed	Recycled	Disposed	Recycled	Tonnes	%
Paper & Cardboard	138000	225500	318500	274000	3500	0	959500	52%
Plastic	59500	17000	199000	29000	8500	0	313000	15%
Glass	37500	82000	20000	38000	0	0	177500	68%
Ferrous	22000	8000	59500	365000	39500	365000	859000	86%
Garden Organics	334000	417000	59500	156500	15000	0	982000	58%
Food	367500	0	79500	31500	0	0	478500	7%
Timber	0	0	139500	34500	83000	78000	335000	34%
Soil/Rubble ^(a)	0	0	0	0	370000	890000	1260000	71%
Concrete					331000	1296000	1627000	80%
Other recyclables ^(b)	4000	2500	20000	61000	22500	304000	414000	89
Other (waste) ^(c)	230000	0	1095500	0	94500	0	1420000	
Total	1192500	752000	1991000	989500	967500	2933000	8825500	53%

- (a) Soil/Rubble is considered to comprises soil/rubble, soil, terracotta, asphalt, sandstone & sand, and concrete/brick
- (b) Recyclables comprises Aluminium and other non-ferrous metals, liquid paperboard, mixed hardcore C&D waste, and Other C&D waste.
- (c) For Municipal and C&I Other waste comprises mixed and contaminated waste not suitable for recycling. For C&D Other waste also comprises Asbestos and Contaminated soil

Industry benchmark and producer responsibility data

The *Extended Producer Responsibility Priority Statement*, released by the Department of Environment and Conservation (NSW) in March 2004 identified 16 “wastes of concern” of which there are nine priority wastes for the next 12 months. Immediate priority will be given to:

- wastes without a post-consumer management scheme:
 - computers;
 - televisions;
 - used tyres;
 - nickel cadmium (NiCad) batteries, excluding mobile phone batteries; and
 - plastic bags.
- wastes with a post-consumer management scheme in place, which the Department of Environment and Conservation (NSW) will monitor and evaluate:
 - agricultural/veterinary chemicals (ChemClear);
 - agricultural/veterinary chemical containers (drumMUSTER);
 - mobile phones and batteries (Australian Mobile Telecommunications Association); and
 - packaging waste (National Packaging Covenant).

The following data summarises the current performance of each of the priority wastes. The data is drawn from the *Report on the Preliminary Consultation Program* which contains revised fact sheets on the wastes for priority focus and provides brief outlines of what’s happening overseas in relation to Extended Producer Responsibility (EPR) and product stewardship schemes for the nominated wastes as well as providing an extensive reference list for those wishing to obtain more information on EPR schemes for particular waste streams.

Computers

It is estimated that 5,000 tonnes of computers are disposed of to landfill every year in NSW. Modelling of industry figures by Meinhardt Infrastructure and Environment Group²² estimated that nationally by 2006 there would be 1.6 million computers disposed of to landfill, 1.8 million sent to storage (in addition to some 5.3 million already in storage) and 0.5 million recycled.

Industry advises that 1.2 million televisions are sold annually in Australia but that only 120,000 of these are made locally²³. It is estimated that between 5 - 15,000 tonnes of televisions are disposed of to landfill every year in NSW. New technology associated with the move to digital televisions in 2008, flat screens and home theatres, is likely to accelerate disposal in the medium term.

Used tyres

It is estimated that around 170,000 tonnes of waste tyres are generated in Australia each year - equivalent to around 18 million passenger tyres. Of these, it is estimated that over 50% of waste tyres go to landfill and a small but significant amount continue to be disposed of inappropriately, such as through illegal dumping²⁴.

The Department of Environment and Conservation (NSW) has reviewed its estimates of waste tyres in consultation with the tyre industry. As NSW accounts for 30% of vehicle registrations²⁵, NSW would account for approximately 51,000 tonnes of waste tyres each year. Retreads are the highest value reuse of tyres but this reuse has been declining for passenger tyres, particularly since the introduction of the Goods & Services Tax, which has increased their price relative to new tyres. Eventually retreads require recycling or disposal.

In NSW, it is estimated that 11,000 tonnes of tyres (22%) are crumbed for use in asphalt, bitumen, building products, and other products. A number of these applications have the potential for significant growth. The crumbing process results in some residual waste, which is sent to landfill. Industry claims that around 8,000 tonnes (16%) of used tyres are exported from NSW. A further 3,000 tonnes are used in civil engineering and building applications (6%).

The industry believes that less than 1% of tyres are illegally dumped, and that about 5% of tyres are illegally stored²⁶. The remainder, approximately 25,500 tonnes or 50%, are disposed of to landfill in NSW²⁷.

²² *Computer and Peripherals Material Project*, consulting report prepared for Environment Australia by Meinhardt Infrastructure & Environment Group for Environment Australia, October 2001

²³ Industry estimate provided at Consumer Electronics Suppliers Association Meeting with EPA, 20 March 2003

²⁴ Environment Protection and Heritage Council, October 2002, *A National Approach to Waste Tyres: Policy Discussion Paper*, P 1.

²⁵ Australian Bureau of Statistics, *9309.0 Motor Vehicle Census*, Australia, November 2002. Previously, the EPA estimated the NSW share of waste tyres on the basis of population share (36%), not share of registrations (30%).

²⁶ The DEC's Sydney Waste Section is currently investigating five sites involving a total of 700 tonnes of tyres that have been illegally dumped or stored. This equates to 1.4% of waste tyres in NSW. Illegal storage/dumping has occurred in other parts of the states and smaller scale dumping is managed by Local Councils. The size of illegal dumps/stores can vary significantly from year to year.

²⁷ The disposal of whole tyres is banned in the Sydney Metropolitan Area/Extended Regulatory Area. Tyres are subject to regulatory controls to prevent burning and dumping and for the transport, storage and processing of large quantities of tyres.

Table 11: Waste Tyres: NSW Annual Generation and Disposal 2001

	Crumbed for asphalt, bitumen, building products	Civil and Building	Export	Illegally dumped or stored	Landfill	Total
Tonnes	11000	3000	8000	3500	25500	51000
%	22	5.5	16	6.5	50	

Batteries

A total of 8.5 million NiCad batteries were imported into Australia in 2002, of which 3.9 million were installed in an appliance. It is estimated that 3.3 million NiCad batteries were sold in NSW in 2002. However, following a 10% decline in imports of NiCad batteries between 2000 and 2002, imports dropped sharply in 2002. This decline is primarily the result of both laptops and mobile phones no longer using NiCad batteries. In 2002 it was estimated that 2,047 tonnes of NiCad batteries were consumed²⁸. The number of NiCad batteries disposed to NSW landfills is difficult to estimate but is thought to be less than 500 tonnes, or 0.1% of the total waste stream.

Recovery Schemes

The Australian Mobile Telecommunications Association (AMTA) scheme for the take-back of mobile phones and batteries has 1,800 retail stores and repair centres acting as collection points Australia-wide²⁹.

Since 1999 AMTA has collected 61 tonnes of batteries, including 32.5 tonnes of batteries containing cadmium NiCad batteries. While these batteries are no longer used in mobile phones, there would still be old stock with NiCad batteries awaiting collection³⁰. Battery World, a franchise network of more than 100 stores across Australia, currently offers a recycling service for cellular phones and batteries as part of the AMTA scheme and also accepts lead acid batteries. It is currently developing a recycling service for other rechargeable batteries and other battery technologies that involve specific hazardous waste handling procedures.

Plastic bags

6.9 billion lightweight bags containing HDPE are used annually³¹. This equates to just under one bag per person per day. A further 0.9 billion thicker 'boutique' style bags are also used³². Industry advises that many of the lightweight singlet-style bags used each year are likely to be reused as carry bags and bin liners prior to disposal. Approximately 37,000 tonnes of plastic bag waste are disposed in landfills each year - 2% of the total amount of plastic produced in Australia each year³³.

²⁸ Data in this section has been drawn from Nolan ITU Pty Ltd, August 2003, *Environment Protection Authority NSW, Trends in Nickel Cadmium Battery Consumption and Recovery*.

²⁹ AMTA Mobile Phone Industry Recycling Program Frequently Asked Questions brochure

³⁰ AMTA Product Stewardship Policy Statement

³¹ Nolan-ITU Pty Ltd, December 2002, *Environment Australia, Plastic Shopping Bags – Analysis of Levies and Environmental Impact, Final Report*

³² Ibid.

³³ Ibid.

Recovery Schemes

Plastic bag manufacturers are developing and marketing biodegradable packaging. They are also involved with retailers in trials of biodegradable and other types of plastic bags.

In March 2003 more than 180 Councils Australia-wide, including NSW Councils from urban, regional and rural areas, participated in the 'Bag Yourself a Better Environment' Campaign run by Clean Up Australia. Activities included Councils linking the program with their existing anti-litter programs and local schools receiving calico bags and information brochures.³⁴

Complementary to this, selected supermarket chains operate bag free lanes in some of their stores. They also offer shoppers calico bag and heavy-duty polypropylene bags as plastic bag alternatives. Councils promote plastic bag reduction and recycling to their communities and in some areas this is used as a fund raising activity for local schools. For example, Woolworths Gunnedah collected 150 bins full of bags, donating \$5 for every bin collected.

Mobile phones

Heavy metals in mobile phones and batteries, such as nickel, copper and cadmium, may have an adverse impact on the environment if disposed in landfills or energy-from-waste facilities, as well as during reprocessing. In Australia, 4-6 million mobile phones and batteries are disposed of or recycled each year, according to the Australian Mobile Telecommunications Association (AMTA). Some components used in mobile phones and batteries are made from non-renewable resources. The rapid development of new models and technology has accelerated the number of obsolete mobile phones. AMTA estimates that Australia's 12 million mobile phone users replace their handsets every 18-24 months. The quantity of mobile phones disposed in landfills is low, estimated to be under 500 tonnes per year in NSW and less than 0.01% of the total waste stream.

Recovery Schemes

In 1999, the mobile phone industry established a voluntary program to recycle the potentially toxic components in mobile phones, batteries and accessories. A levy of 42 cents on each new phone handset and 13 cents for each battery pays for the collection and appropriate disposal of unwanted phones and batteries. The industry scheme, managed by AMTA, collected approximately 177 tonnes of mobile phone handsets, accessories and batteries to June 2003 (approximately 250,000 handsets).³⁵ Of this 177 tonnes, 32.5 tonnes contained cadmium.

Agricultural/veterinary chemicals (ChemCollect) and agricultural/veterinary chemical containers (drumMUSTER)

Until December 2002 a national program funded by State and Commonwealth Governments, called *ChemCollect*, provided for the collection, storage and destruction of hazardous, unwanted and unregistered agricultural/veterinary chemicals. The scheme commenced in NSW in mid 2000 but collections ceased in December 2002. During that time, 628 tonnes of chemicals were collected from 6719 respondents in 134 Council areas.

The most commonly collected chemicals were "general" pesticides (65.4% by weight). Organophosphorous pesticides were the next most common chemical (9.3%) followed by Arsenic and its compounds (7.2%). Scheduled organochlorine pesticides (OCPs) such as

³⁴ For details see Clean Up Australia's plastic campaign (<http://www.cleanup.com.au/main.asp?RequestType=Doc&DocID=111&CatID=51>).

³⁵ AMTA, Mobile Phone Industry Recycling Program Collections to June 2003

DDT and Dieldrin, which were the original target and rationale of the program, formed only 5.7% of the material collected. Industry is now proceeding to roll out a replacement program called Chemclear, which is funded and run by big industry.

A national program for the collection and recycling of empty, cleaned, non-returnable crop production and on-farm animal health chemical containers was established in 1999. The drumMUSTER program was jointly developed by the National Farmers Federation, the National Association for Crop Production and Animal Health (Avcare), the Veterinary Manufacturers and Distributors Association, and the Australian Local Government Association. All parties are signatories to a national Industry Waste Reduction Agreement, which has set targets to:

- recover 66% of clean, empty, rinsed chemical containers through drumMUSTER; and
- supply 50% of raw materials in recyclable or returnable packaging.

Data for the period from 1 January 2003 to 5 February 2004 shows that 121 NSW Councils participated in drumMUSTER across NSW, with a total of 1397 collections held. More than 98 % of annual drum sales are being recovered through the program.

Eighty-four out of 87 identified "priority Councils" (priority Councils have more than 2000 drums sold in their area per annum) participated with a total of 1253 collections, and 99.14% of annual drum sales serviced.

Table 12: Drum muster: (Data from 01/01/1999 to 05/02/2004)

	NSW & ACT	Australia
Total number of drums collected	1,086,452	4,650,995
Total Weight of drums collected (tonnes)	2040.2	7067.7 †
Composition of drums (by number)	31% Steel, 69% plastic	33% Steel, 67% Plastic
Composition of drums (by weight)	58% Steel, 42% plastic	50% Steel, 50% Plastic

An audit of drum sales in 2001 estimated that 4.235 million drums were sold nationally, including 1.232 million in NSW. The return rate for drums was 33% nationally and 28% in NSW³⁶. Refillable containers accounted for 30% of the volume of chemicals sold in 2001³⁷.

Newsprint recovery

The Publishers National Environment Bureau (PNEB) has had a national voluntary producer responsibility agreement in place for the past 12 years. The current plan runs until 2005 and includes targets to increase recovery of newsprint and magazines for recycling to 74%. In the Mid Term Review of its 2002-2005 Industry Waste Reduction Agreement, the PNEB reported that 2003 newsprint recycling data showed that Australia has the highest recovery rates in the world at 73.5%. Before 1990, the recycling rate was 28%. In 2003, NSW had the equal highest recovery rate with Victoria at 77% recovered for recycling.

PNEB estimates that even taking out the materials contributed from pressroom waste and publisher returns, the 2003 post-consumer collection was 69.3%, which would equate to 80 % of people recycling 87 percent of their newspapers. 19% of the newsprint used in

³⁶ drumMUSTER collection statistics between 1 January 2001 and 31 December 2001

³⁷ Avcare (2003), Presentation on drumMUSTER, provided in June 2003

Australia ended up in landfill in 2003. Over the period 1990 to 2003, newsprint has dropped from 3% of total national landfill volumes to 0.65%.

Recycled Publication paper purchased by Norske Skog's Recycled Fibre Division for the Albury recycling and de-inking plant to provide fibre for its newsprint making machines rose by 9% in 2003 to 176,262 tonnes. This growth came from a 17% increase in the recovery of old newspapers from kerbside recycling collections, and a 10% increase in the recovery of old magazines. Paper recovered from newspaper printing facilities has been reduced by 1%, as a result of waste reduction achieved through improved process efficiency in these plants.

Table 13: The following table shows uses of recycled newsprint³⁸

	2001 (tonnes)	2003 (tonnes)
Total consumption	682,766	718,482
Cardboard industry	233,749	231,435
Exports	133,375	142,386
New Newsprint in Australia	127,018	146,703
Alternative waste technologies	0	7,887

Plastics

The Plastics and Chemicals Industry Association (PACIA) provides an annual report on plastics recycling for Australia^{39, 40}.

The 2002 Report showed that the amount of recycled plastic reprocessed in NSW rose sharply by 41% from 35,336 tonnes to 49,730 tonnes. However, NSW was the only State to record an increase in domestic reprocessing. By contrast, in Victoria, which has the largest reprocessing industry, total tonnage fell by 25%.

In 2002 the national plastics packaging recycling rate was 24%. The overall plastics recycling rate (consumables and durables) was 13.4%. In 2002 domestic consumption of plastic polymers fell by 6% during 2001 to 1,185,913 tonnes. Over the same period overall production by plastic reprocessors fell by 11.5% to 116,211 tonnes.

Steel Cans

The National Steel Can Recycling Council provides an annual update on steel can recovery across Australia. In 2002, 92% of the NSW population had access to steel can recycling and NSW recovery rates are currently 42%.

Other new benchmark data

Office towers and shopping centres

An audit of ten office towers across Sydney, Newcastle and Wollongong in 2001- 02 provided the first benchmark data for the amounts of recyclables and waste generated in office blocks. The audits were all conducted in multi-tenanted office blocks of 5,000 to 50,000 square metres.

³⁸ PNEB Mid term Review and Third Year report March 2004

³⁹ PACIA 2002

⁴⁰ PACIA 2003

The results showed that the average total waste generated (including recycling) was 0.81kg/square metre/month. The average recycling rate was 41% or 0.36kg/square metre/month ranging from 24% to 49% of all waste generated. The average contamination rate was found to be quite low at only 3%. Office paper represented 56% of all waste generated.

Local Government good practice kerbside recycling benchmarks

Preliminary good practice performance benchmarks have now been developed for Sydney metropolitan Council kerbside recycling systems ⁴¹. The initial measures were based on data from 21 volunteer Councils. The Department of Environment and Conservation (NSW) is encouraging all Councils to calculate their own performance against the measures and send it to the Department to help validate the benchmarks and inform development of different measures for other areas of the state. The good practice performance measures established for kerbside recycling are set out below. Both a baseline and "stretch" target are included in most cases:

Table 14: Preliminary good practice measures

Performance Measure		Unit	Description	Potential Good Practice Measure baseline	Potential Good Practice Measure stretch
1	Household Net Yield	Kg/h'hold/wk	Total quantity of kerbside recyclables collected per household, excluding gross contamination.	≥ 4.0	≥ 5.5
	Per Capita Net Yield	Kg/person/wk	quantity of kerbside recyclables collected per person, excluding gross contamination.	≥ 1.5	≥ 2.1
2	Net Diversion	%	Total proportion of domestic waste diverted to the recycling stream.	≥ 19%	≥ 29%
3	Contamin-ation	%	Contaminants placed in recycling bins by householders	N/A	≤ 3.5%
4	Service Cost	\$ / h'hold/year	Annual cost for collection and MRF acceptance of kerbside recyclables, exclusive of Council administration costs.	Target range \$24 - \$49	
5	Tonnage Cost	\$ / tonne	Cost per net tonne of kerbside recyclables collected and accepted at MRF, exclusive of Council administration costs.	Target range \$143 - \$225	

In addition, standard bin colours for garbage and recyclables from households and in public places, and the range of materials which should be collected for recycling, have been established.

Litter and illegal dumping

New NSW wide data

There is limited data available on litter and illegal dumping. During 2003, the Department of Environment and Conservation (NSW) completed a consultation on the development of

⁴¹ *Good Practice Performance Measures for kerbside recycling systems* – Department of Environment and Conservation (NSW) (March 2004).

methodology for collecting volumes and weight data for litter. A survey methodology that combines both collection of weight and volume data and behavioural data has been agreed. The methodology is based around the Clean Communities Assessment Tool (developed by Community Change Pty Ltd) and will assess 200 sites of significance for littering across NSW. This methodology is also used in Victoria. A sub-sample of 60 sites will also be selected for the collection of litter to provide composition data by weight and volume. Through repeated surveys it is expected that trends will be able to be identified in litter quantities and in the “cleanliness” of sites. The first data set will be collected during 2004.

Current snapshot

The following data is derived from a range of sources and provides the best picture currently available of littering and illegal dumping practices and behaviour. Sources include:

- Some local audit data has been generated and is held by individual councils RID Squads and Sydney Water.
- The Beverage Industry Environment Council (BIEC) Litter Behaviour Studies provide the best information about littering. There is no equivalent information about dumping or landfilling behaviour.
- Some data is available in the Illegal Dumping Data Base compiled by the Rural Fire Service in 2002 on estimated amounts of dumped material in areas around the urban fringes of Sydney, Newcastle and Wollongong.
- Infringement data is available from the Infringement Processing Bureau [IPB] re littering dumping and landfilling. This data indicates the extent to which PINS and Notices have been issued, which is at best an indicator only of the extent of the problem
- Research into what approaches have occurred to address Illegal Dumping is currently being undertaken for the Department of Environment and Conservation [NSW] by the Institute of Sustainable Futures at the University of Technology [Sydney].

Litter Behaviour Index

The Beverage Industry Environment Council’s (BIEC) *Littering Behaviour Studies* measures people’s *actual* littering behaviour and then relates this to their self-reported behaviour. A particular methodology, designated the “Observational Approach” was developed together with a “Disposal Behaviour Index” that had the advantage of measuring positive disposal practices as well as negative littering behaviour. Observations and interviews were undertaken at core sites including beaches, markets, parks, public buildings, shopping strips, shopping malls, transport areas and waterfronts.

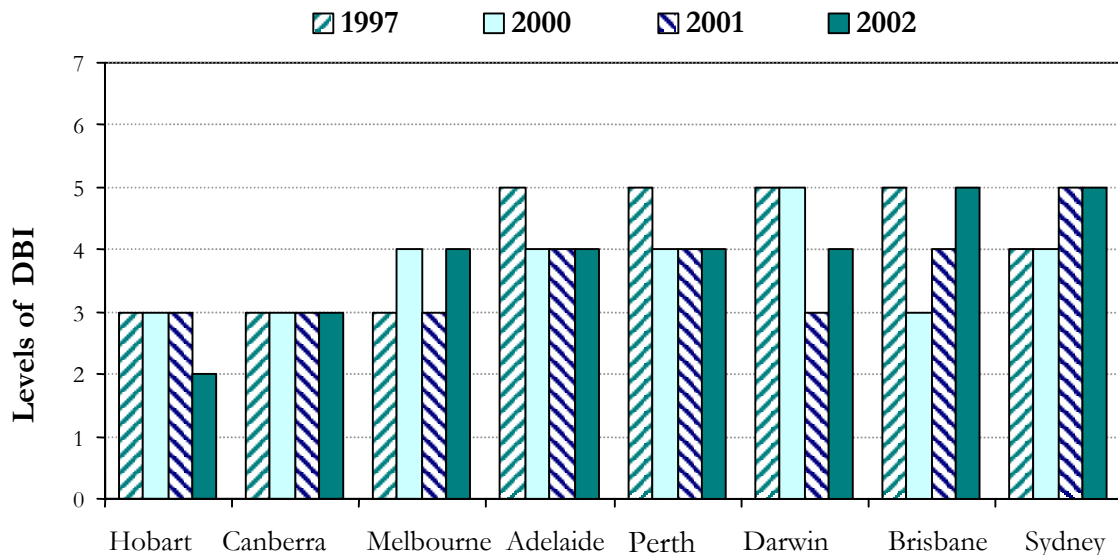
The findings for most sites in Sydney indicate that about 70% of people were disposing of litter appropriately in areas where there was a nearby bin. Probably the most significant finding from these studies however, is that people’s self-reporting of littering behaviour does not correlate with the observed littering behaviour. In 2002 the data showed that 60% of people *who had minutes before been observed to litter* denied that they had in fact littered.

Sydney and Brisbane were cleaner than other Australian cities during 2002, according to the findings of volumes 4 and 5 of the Littering Behaviour Studies (LBS), which were released in May 2003⁴². Sydney and Brisbane continue to lead the other Australian capital cities in terms of lower than average levels of littering behaviour, combined with higher than average rates of people ‘doing the right thing’ and using the bin, according to the findings of the Littering Behaviour Studies 5.

⁴² Beverage Industry Environment Council *Littering behaviour Studies*

Sydney is the only capital city to record an improvement for the past two years (compared to baseline levels). In 2001 and 2002, less littering and more bin use was observed at core sites in Sydney and Disposal Behaviour Index (DBI) levels (which show the amount of littering, recycling and binning at a site) have shown sustained improvements exceeding the national average. Sydney has maintained its performance at DBI level 5 compared to the national average at DBI 4.

Table 15: The table below shows the trends for disposal behaviour in each capital city since 1997.⁴³



Littering fines

The number of littering fines (Penalty Infringement Notices or PIN's) issued almost doubled between 1999-2000 and 2000-2001. This is likely to have been affected by the introduction of several new littering offences including those relating to advertising material and "aggravated" littering offences (eg breaking glass).

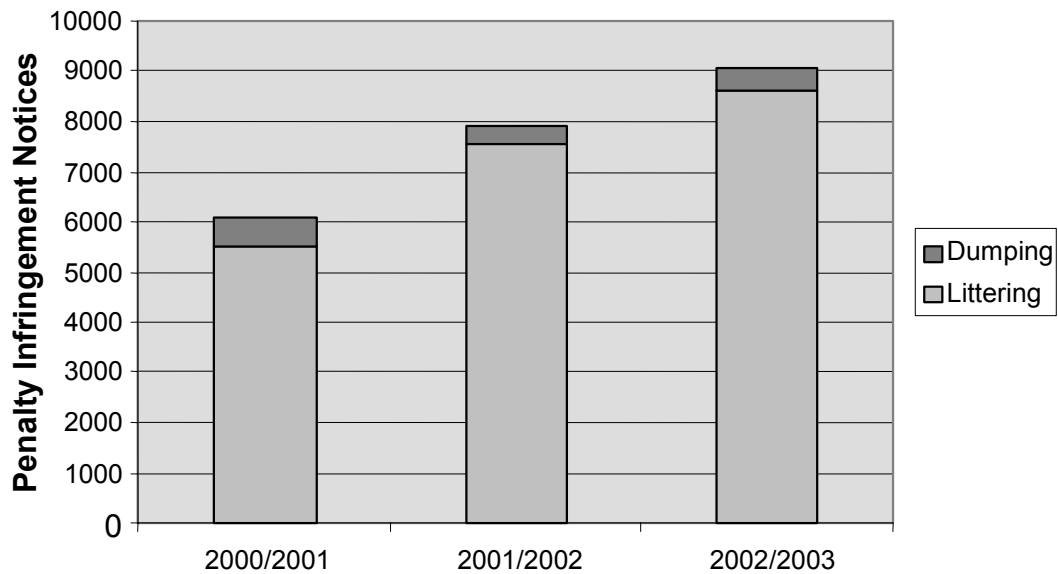
The number of offences continued to increase in 2001-2002, and again in 2002-2003 as shown in table 16. This might reflect either an increase in the number of littering offences, or an increase in the intensity with which offenders are sought out and fined. The Department of Environment and Conservation (NSW) through the former EPA has trained more than 800 officers from Councils and relevant government agency staff to assist in educating people about litter reduction and enforcing the new laws.

More than 8500 (8631) littering fines were issued in 2002-2003 by a range of agencies including local government, the Department of Environment and Conservation (includes former EPA, NPWS, RNSW), Sydney Catchment Authority, NSW Police and other State government agencies. Councils have issued most PIN's over the period but government agencies have also carried out a strong enforcement role. NSW Police, in particular, have shown strong support for the legislation over the past three years.

PIN's for illegal dumping are mainly issued by local government. Often this occurs as a result of complaints to councils and local investigation procedures. Almost 1500 PIN's have been issued in the past three years with most of these relating to transporting waste to a place that isn't a lawful waste facility.

⁴³ Beverage Industry Environment Council *Littering behaviour Studies*

Table 16: Number of penalty infringement notices issued



Illegal dumping incidences and other dumping data collected via the Department of Environment and Conservation (NSW) illegal dumping study

Regional Illegal Dumping squads have been established by some groups of Councils to tackle illegal dumping. The longest established squad covers the Councils of Baulkham Hills, Bankstown, Fairfield, Hawkesbury, Holroyd and Penrith in Western Sydney. The Greater Southern RID Squad is the second squad to form and it is operating on the South Coast and Southern Highlands.

In 2002-2003, the Western Sydney RID squad received 779 complaints, with 300 of these from Council referrals, 117 from direct community contact, and 79 from the squad's own surveillance and inspection activities. The squad commenced 782 investigations - 350 being household domestic waste, and 92 illegal landfilling incidents. Nine illegal waste sorting facilities were also investigated.

During 2002-3, the Western Sydney RID squad issued 236 PIN's, with a combined value of \$152,492. Fifty clean up notices and clean up directions for dumped waste to be removed were issued, with a value of \$16,000. The Squad also undertook 24 specifically targeted operations in hotspot or problem areas.

Litter in waterways

Very strong evidence for the reduction of litter in Sydney is provided by a report commissioned in 1993 by the (then) NSW EPA and Sydney Water into litter capture rates in Sydney Water's gross pollutant traps (GPTs) and trash racks.

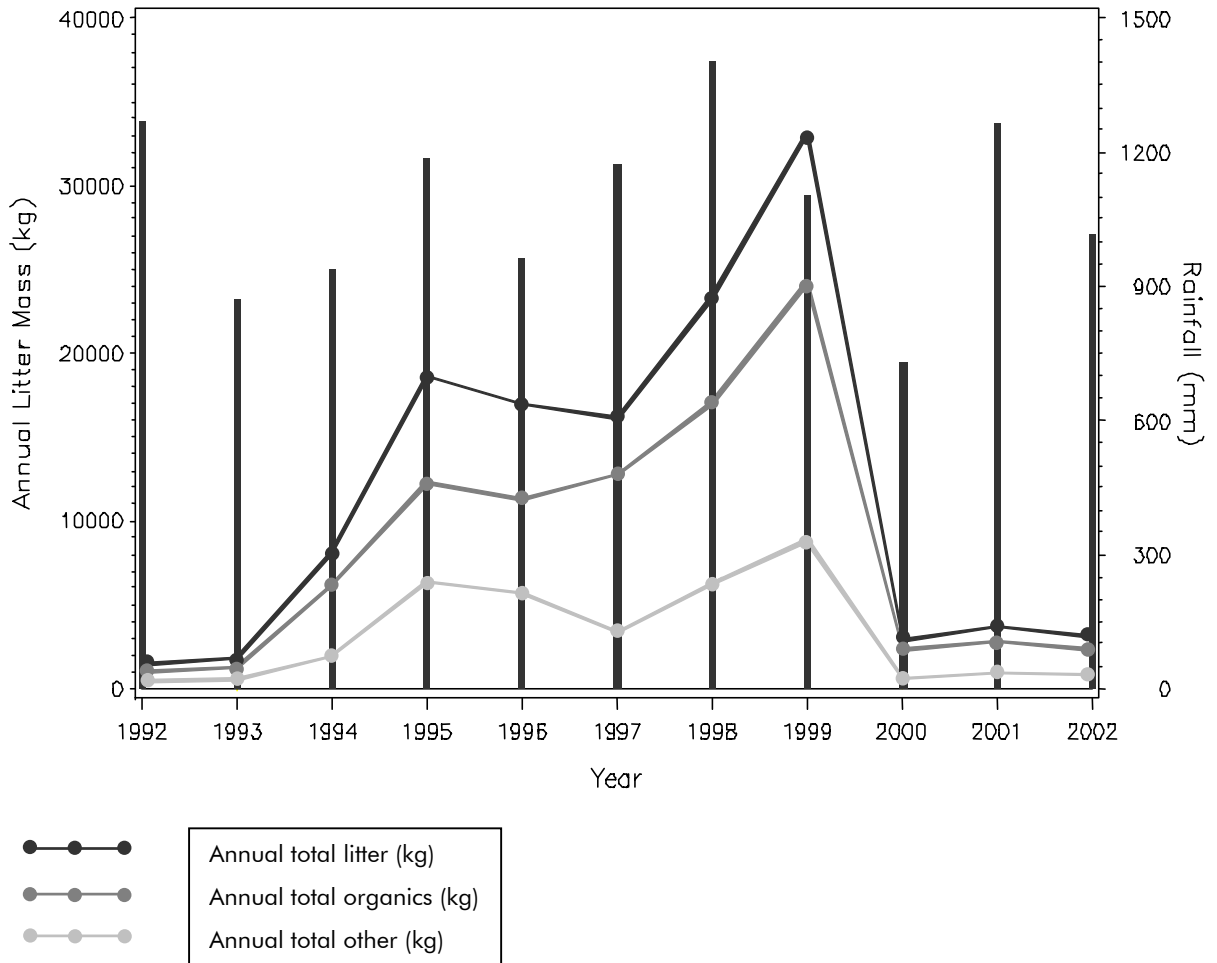
Table 17 shows a time series analysis of the annual litter, total organic materials and other⁴⁴. Annual rainfall is shown because street flushing carries litter into GPTs and periods of high rainfall would usually be associated with higher litter capture rates.

This data shows a dramatic decrease in litter captured across Sydney GPTs after 2000. This decrease is equal to an overall 53% average decrease in litter captured from 1996-1999 to 2000-2003, after correction for rainfall. This decrease correlates precisely with years that the Government's Urban Stormwater and Litter Prevention programs were implemented.

⁴⁴ Sinclair Knight Merz, October 2003 "Assessment of the Effect of the Urban Education Program on Litter Captured by GPTs and Trash Racks. Report #2 – Revised Assessment

In particular, the Study⁴⁵ also reported that when litter data from 2003 was compared against a similar wet weather period in 1998, the quantity of litter captured was substantially lower in 2003, suggesting that there has been a long term decrease in litter capture rates independent of rainfall.

Table 17: Litter Captured by Sydney Water GPTs and Trash Racks 1992-2002
Analysis of Litter Loads in Sydney Water GPTs and trash racks in inner Sydney
by Sinclair Knight Mertz



According to Sydney Water⁴⁶ approximately 1,615 cubic metres of rubbish were collected from the drainage system pollution control devices in 2002/03, and four new traps were installed bringing the total to 26. With the proportion of non-organics being around 25% this indicates that that there was approximately 400 cubic metres of litter collected. Anecdotal evidence suggests that this was mostly comprised of plastic bags, bottles and food containers.

Clean Up Australia

Clean Up Australia Day data gives an annual measure of litter collected and as such it provides information about what people discard of inappropriately. It is limited as a

⁴⁵ Sinclair Knight Merz, October 2003 "Assessment of the Effect of the Urban Education Program on Litter Captured by GPTs and Trash Racks. Report #2 – Revised Assessment

⁴⁶ Sydney Water 2003: Stormwater Indicator – Pollution Removal see Sydney Water web site.

measure of the extent of the problem, because clean up only happens annually, the volume collected is entirely dependent on the number of volunteers and the locations where the data is collected are not always the same from year to year. However, information from Clean up Australia indicates that from a simple analysis of tonnes of rubbish collected compared to the number of volunteers over the past 10 years, there has been a reduction in the amount of litter collected from 42kg/ person in 1994 to 12 kg/person in 2004.

The Rubbish Report 2003⁴⁷ published by Clean up Australia includes information provided by volunteers cleaning up a variety of sites including beach and coastal areas, outdoor transport, parks & waterfront, rivers & creeks, roadways, school grounds, shops and malls. Surveyors identified and counted one in five bags collected at each site, stopping if they reached more than 10 bags. Around 30% of the bags of rubbish at 7.4% of all sites were sampled. In NSW around 100 sites were surveyed, representing rural and urban locations in equal proportion.

The report stated that in NSW a total of 34,735 items were surveyed. Of these, 34% were plastics, 21% paper & cardboard, 13% glass, 13% metals, 3% polystyrene, 2% wood, 1% rubber and 12% miscellaneous. Sites most often surveyed were parks & waterfront, roadways and school grounds.

Household chemicals

During 2003 and 2004, the Department of Environment and Conservation (NSW) conducted 69 collections of HHW across the Sydney, Hunter and Illawarra regions in partnership with Local Councils. More than 12,000 householders attended the collections and brought in more than 500 tonnes of chemicals for safe disposal. These included batteries, gas bottles, general liquids, oils, paints and poisons.

Community behaviour and drivers

A number of key pieces of social research have been undertaken which are providing valuable insights into aspects of community knowledge, attitudes and behaviour relating to waste, littering, illegal dumping and purchasing. These will assist in future program planning.

Who Cares about the Environment 2003

Conducted every three years since 1994, this social research measures environmental knowledge, views, attitudes and behaviour of people across NSW. The 2003 research⁴⁸ included core questions to provide comparisons with previous years, as well as some new questions. Some of these related to waste issues.

Waste issues have remained steady in mentions in the most important environmental issues in NSW today. Nine percent mentioned it as the single most important issue and 11% as the second most important issue, the same as in 2000 and slightly down on 1997. Specific concerns for the two most important issues together were:

- | | |
|--|----|
| ▪ Litter and dumping of rubbish | 8% |
| ▪ Waste disposal or management | 4% |
| ▪ Recycling household rubbish or garbage | 3% |
| ▪ Sewage treatment or sewerage problems | 3% |
| ▪ Wasteful packaging of products | 1% |

⁴⁷ See www.cleanupp.com.au

⁴⁸ Department of Environment and Conservation (NSW) *Who Cares about the Environment in 2003*

Views on whether minimising waste that the community produces has improved or deteriorated over the past three years remained the same as in 2000 with 52% believing it has improved, 19% believing it has got worse and 27% seeing no change. People with tertiary qualifications and those living in Sydney were less likely to see improvements.

Views on our effectiveness in dealing with household rubbish improved slightly with 72% believing things have improved over the past few years (compared to 69% in all three previous surveys). Those who perceive things are worse remain on 9% across all four surveys and those seeing no change is 19% (19-21% previous surveys). Those in Newcastle/Wollongong are more likely to see improvements in this area, and those with tertiary qualifications less likely.

Questions about personal engagement in specific environmentally friendly behaviours were framed differently in 2003 to previous years (measure of frequency vs. simple yes/no previously). This means that direct comparisons with previous years cannot be made. The following table shows responses to litter and waste related questions in 2003.

Table 18: Responses to litter and waste related questions 2003

	% respondents			
	Often	Sometimes	Just occasionally	Never
Avoid litter etc down stormwater drains	70	11	5	12
Decided to reuse	62	24	8	6
Avoided excess packaging	40	25	13	21
Avoided plastic bags to carry shopping	31	22	12	35

Those respondents aged over 35 were more likely to have sometimes avoided excess packaging and plastic bags. Women were more likely to have avoided excess packaging and reused something. Those living in Sydney and those with less than secondary education were less likely to have avoided excess packaging and those from a non-English speaking background were less likely to reuse items. Those in regional areas were more likely to reuse than those from the cities (Sydney, Newcastle, Wollongong).

People were also asked to identify their most damaging behaviours from an environmental viewpoint (previously asked only in 1994). Of thirteen behaviours identified in this open-ended question, six were related to waste. The following table summarises these responses.

Table 19: Waste related responses to damaging behaviours

	% of respondents	
	1994	2003
Buying products with excess packaging	15	9
Not recycling enough	14	9
Generating too much rubbish	7	3
Being careless with litter	5	4
Wasting paper	0	5
Failing to compost (enough)	5	0
Don't know	30	18

People over 35 years old and those from non-English speaking backgrounds were more likely to be unable to identify any damaging behaviour ('don't know'). People under 35 were more likely to report wasting paper, not recycling enough and generating too much waste.

Attitudes and behaviour to household chemicals management

The Department of Environment and Conservation (NSW), through the former Resource NSW, commissioned research by Woollcott Research to underpin the development of the Chemical Clean Out program. The report, *A Benchmark and Evaluative Study of Knowledge, Attitudes and Behaviour Regarding Household Hazardous Waste (2002)*, based on 6 focus groups, 15 interviews and a phone survey of 800 people across NSW, provides a snapshot of beliefs, knowledge, attitudes and current behaviour regarding usage and avoidance, storage and disposal of 'hazardous' chemicals and substances used in the home. It also provides a benchmark measure against which future tracking of changes can be assessed, as well as providing an important input into strategic planning.

The report provided information about current recycling behaviour, awareness of materials in the household that may need special disposal and handling, facilities for disposal of household chemicals and recyclable materials, cleanout patterns and likely willingness to attend weekend collection points.

The research confirmed strong support for recycling with more than 70% of respondents claiming to recycle the majority of items, with 60% recycling "substantially more" than 10 years ago. However, without any prompting there was limited awareness of the types of items that might require special or more careful disposal. Without prompting the most commonly mentioned item was paint (33%), followed by chemicals (27%), and fuels (27%).

Between 20%-30% of householders said they would need to dispose of solvents, caustic cleaners, chemicals, car batteries, rat/cockroach baits, detergent, or paint in the near future but, on average, people clean out less than once a year (every 17 months). Twenty-seven percent indicated that they had never undertaken a clean-out of this nature, either believing they did not have household chemicals, or that they would eventually use up the chemicals they did have, indicating that many people have potentially harmful materials stored (long-term) within their home.

A high proportion of respondents were aware of the current Council clean-up days (40% unprompted and 90% in total) and 38% of those surveyed said they would use a drop off collection service if it was convenient and easy.

Illegal dumping in Multi Unit dwellings

The Department of Environment and Conservation (NSW) commissioned social research into illegal dumping⁴⁹ awareness and behaviour of multi unit dwelling residents⁵⁰. This is being used to inform the development of an illegal dumping education program which will target and reduce the incidence of illegal dumping in and around multi unit dwellings.

The objective of the initial qualitative stage of the research was to provide a detailed understanding of the issues surrounding illegal dumping among multi unit dwelling residents, including the extent of dumping, whether it is regarded as a problem by

⁴⁹ For this research, illegal dumping is defined as the illegal deposit of waste onto land, i.e. waste materials dumped, or otherwise deposited on private or public land without appropriate authorisation. Waste includes items such as general household waste (from supermarket bag size up), larger domestic items such as fridges and mattresses, garden refuse, building materials, clinical and hazardous wastes and tyres (refer to Appendix 1). Such wastes can occur in any quantities, in any mixture, and for the purpose of this research, within or around multi unit dwellings. It does not include littering, i.e. small items of litter such as cigarette butts, chip packets, and takeaway packaging.

⁵⁰ Source: Multi Unit Dwelling – Illegal Dumping Education Program Social Research Brief

communities and Councils, what drives this behaviour and levels of awareness of options/alternatives to dumping illegally.⁵¹

The research targeted residents living in multi unit dwellings including owner-occupiers, tenants, NESB residents and Department of Housing residents⁵²

The results were quite surprising. Illegal dumping is viewed by many as only a minor misdemeanour at worst, while many people view it as a form of recycling. Few could see any major problems with such behaviour.

Most people view the cleaning up of illegally dumped material as the responsibility of the Local Council. Lack of access to, knowledge about and in some cases the desire to avoid the cost of proper disposal all contribute to illegal dumping behaviours. Residents re-locating ('moving house') were identified as one of the main factors giving rise to illegal dumping.

In the follow up quantitative study, a relatively large proportion of multi unit dwelling respondents indicated that dumping did occur in their area (59%). Although few people in the phone survey admitted to personally dumping (only 14%), in the qualitative component of the study almost all respondents admitted to having dumped illegally at one time or another.

Consumer demand for environmental packaging

This research by Taverner Research Company was funded jointly by the NSW government and industry under the National Packaging Covenant. It sought to understand consumer motives, attitudes and behaviour in relation to packaging, particularly at the time of purchase, through a quantitative research survey which built on earlier research conducted during 2002. In particular, the study sought to test how important recyclability of packaging was to consumers as a factor in their choice of product or package.

The research included: on-site surveys of 1188 supermarket shoppers (males & females aged 18 years and over) at Coles and Woolworths supermarkets in ten metropolitan and regional locations throughout NSW; and a more detailed follow-up survey of 780 shoppers' behavioural and attitudinal information.

The report *Consumer Demand for Environmental Packaging* shows that packaging is a low priority at point of sale. Consumers typically consider price, product (performance, attributes) and convenience with only 3% of the supermarket sample mentioning packaging in an environmental context.

Recyclability was a positive aspect of packaging for 16% of respondents with small numbers mentioning other environmental issues such as being made from recycled materials (3%), no environmental damage (2%) or re-sealable (3%). A further 7% said they liked packaging that was easy to dispose of. However, despite the high level of support and involvement in recycling shown by respondents, there was virtually no link with this at the point of purchase of the product.

The research also showed that consumers are confused about various logos on products. The Buy Australian logo and Heart Foundation logos were most understood. The triangular recycling logo was recognised by 58% of respondents although there was some confusion about whether this meant a product was recyclable or whether it contained recycled content. When asked whether they avoided any packaging materials, half avoided none. The types most avoided were packaging in several layers (14%), plastic bags (14%) and foil trays (12%).

⁵¹ Source: Woolcott Research 2003. *An Assessment of Attitudes and Behaviour In Relation to Illegal Dumping*,

⁵² Source: Multi Unit Dwelling – Illegal Dumping Education Program Social Research Brief

The research also provides a number of insights into the relative importance of the environment compared with other issues and illustrates clear differences between stated attitudes and behaviours eg at point of sale.⁵³

Research into consumer attitudes and behaviour to recycled content research

The Department of Environment and Conservation (NSW) is currently undertaking comprehensive research into the attitudes and behaviour of purchasers when buying products with recycled content. The study is looking at purchasers from State and Local Government as well as businesses and individuals. The research will be used to inform the development of programs which encourage increased consideration of recycled content when making purchasing decisions.

Joint Agency Non-English Speaking (NES) Social Research Project

The Joint Agency Non-English Speaking (NES) Social Research Project is a partnership between the Department of Environment and Conservation (NSW) (former EPA, Resource NSW and National Parks & Wildlife Service), Sydney Catchment Authority and Sustainable Energy Development Authority. The research aims to explore the environmental knowledge, skills, attitudes and behaviours of NES people from the Chinese, Arabic, Greek, Italian, Vietnamese, Spanish, Macedonian and Korean speaking communities in NSW. These communities represent the top 8 ethnic communities in NSW according to the 2001 Census.

The research will assist in providing information on how background and cultural differences affect the knowledge, attitudes and behaviours of people from ethnic communities in relation to the environment; providing information about the preferred communication channels of each of the ethnic communities and promoting discussion and wider awareness of the social dimensions of environment protection.

The study will inform planning, implementation and evaluation of education and communication programs of the partner agencies and will assist in ensuring environmental messages and programs are targeted and culturally appropriate. The research will be completed in mid 2004.

⁵³ Report is available at www.nswjrg.com.au

PART 3. Other important actions and contributions from various organisations to NSW waste reduction outcomes

In addition to the key actions identified in the Waste Avoidance and Resource Recovery Strategy and reported in Part 1, the Strategy also identified some other key areas for action including:

- implementing programs which contribute to the waste avoidance and waste reduction outcomes identified in the Strategy;
- establishing and publicising good practice performance across various sectors;
- facilitating whole-of-system product stewardship initiatives;
- implementing programs to support expanded use of recycled content products and materials;
- implementing programs to improve waste management and resource recovery systems;
- assisting in the recovery and safer management of household chemicals;
- undertaking social and other research to establish benchmarks, relative system costs and performance and to identify community motivations and behaviours to help future program planning and decision making;
- maintaining an ongoing review of interstate, national and international trends and practices;
- developing and supporting improved data collection methodologies and processes to obtain more consistent and more robust data sets; and
- negotiating specific targets and commitments by sectors or organisations to contribute to the overall Strategy goals and targets.

This section describes actions and outcomes of programs undertaken by the Department of Environment and Conservation (NSW) as well as major initiatives of other government and private organisations which are contributing to the specific outcomes listed above and the broader waste reduction and resource recovery goals for NSW. This section is not comprehensive and the Department encourages other organisations not currently identified in this first Report to provide it with information about how they are contributing to the Strategy goals and targets so their contribution can be acknowledged in future Reports.

Extended Producer Responsibility (EPR) and Product Stewardship

EPR Priority statement

Development of an Extended Producer Responsibility (EPR) Priority Statement is a statutory responsibility of the former Environment Protection Authority (EPA)⁵⁴ under the *Waste Avoidance and Resource Recovery Act 2001*. The Priority Statement identifies those wastes which are a priority for product stewardship and action in NSW.

⁵⁴ On 24 September 2003, a number of separate agencies within the environment portfolio were consolidated into a new Department of Environment and Conservation (NSW) (DEC), including the Environment Protection Authority, the National Parks and Wildlife Service, the Royal Botanic Gardens and Resource NSW. The DEC will fulfil the obligations of the EPA.

Before preparing its first Priority Statement, in early 2003 the EPA released the *Consultation Paper: Extended Producer Responsibility Priority Statement* for comment. Extensive briefings and roundtable discussions were held with key stakeholders in the industries affected by the proposals. Eighty-six submissions were received on the Paper and the *Extended Producer Responsibility Priority Statement* released in March 2004 reflects the outcomes of this broad community consultation.

In the next 12 months the Department of Environment and Conservation (NSW) will give priority focus to nine wastes of concern (see Part 2). This will require early action by the identified industries to reduce the amount and/or impact of these materials in the waste stream. Some sectors need to develop new schemes, others need to ensure that existing schemes are operating effectively and delivering measurable outcomes.

For those wastes with existing schemes in place, arrangements for regular monitoring and public reporting of the schemes still need to be put in place. For new schemes to be implemented at either a national or state level, additional infrastructure and operational aspects will be needed including regulatory underpinning in some cases to stop 'free riders'.

An Expert Reference Group with an independent Chair has been established to advise on targets, timelines, reporting and auditing arrangements for the priority wastes identified in the Priority Statement. The Expert Reference Group will also refine the key performance indicators that will be used to assess industry progress and inform the need to shift from voluntary to regulatory approaches.

Data on current recovery rates and outcomes delivered by existing product stewardship initiatives relating to newsprint and magazines, mobile phones and batteries, agricultural and veterinary chemicals and containers and packaging is provided in Part 2.

National Product Stewardship initiatives

Several of the wastes identified for priority focus in the EPR Priority Statement are already being negotiated as part of a national approach. These include TV's, computers, tyres and plastic bags. NSW is participating on working groups with other jurisdictions and industry associations to help guide and provide feedback on proposed schemes being developed by the TV, tyre and computer sectors. Proposals relating to each of these products have been provided to the Environment Protection and Heritage Ministerial Council and work is continuing to refine them with a view to schemes commencing over the next 12 months.

The National Packaging Covenant is a co-regulatory agreement between governments and the packaging industry to manage post consumer packaging and paper. The Covenant was due to expire in July 2004 but Environment Ministers have agreed to an extension until April 2005 to enable a proposal for substantial strengthening of the Covenant model to be developed, including Action Plans. A decision will be made by Environment Ministers in April 2005 whether to continue a Packaging Covenant in the future.

The National Packaging Covenant requires signatories to produce Action Plans and Annual Reports setting out specific actions and progress in reducing the lifecycle impacts of household packaging and paper. There are more than 600 signatories, the majority representing the packaging supply chain (raw material manufacturers, packaging manufacturers, brand owners and packaging users and retailers), along with the federal and state governments and a small number of Local Councils.

Signatory Action Plans typically cover a range of areas including: packaging design; packaging production; distribution and logistics; education; data collection; and labelling. More than 50% of signatories have been members for less than two years so progress against individual Action Plans and aggregated performance is patchy.

A major shortcoming of the current Action Plan model is an inability to be able to aggregate the overall contribution to packaging waste avoidance or reduction, increase in

materials recycled and reduced disposal. However, a recent industry review of the Action plans and Annual reports of 93 major NSW signatories has provided an aggregated list of actions which have resulted in packaging re-design and less use of materials. For example, the review noted actions which have resulted in lighter weight packaging with greater recyclability, as well as total packaging reduction and on-site waste reduction. A selection of the achievements is included in Appendix 2.

Industry sector monitoring and reporting

A number of industry groups are regularly reporting on their performance in reducing waste and improving operational sustainability. Some have been reporting for many years; for others, this is a new initiative, which is welcomed.

The Australian Food and Grocery Council has just released its second Environment Report (2003), following its first report, which was released in 2001. The report seeks to describe the impact of processing and packaging stages in the full production and consumption cycle of food and grocery products. The report covers water, greenhouse, solid waste and implementation of eco efficiency and other initiatives. Ongoing reporting from sectors such as this will help to contribute important benchmark and trend data.

The Paper Recycling Action Group of Australia (PRAGA) was formed in 2001 to encourage the growth of a sustainable recovery industry for paper and paperboard and to enable a reduction in the disposal of these to landfill. PRAGA represents all the major stakeholders in the Australian paper recovery industry, including collectors, paper mills and recycled commodity traders. The Group has identified the relatively low Australian recovery rates of white office and stationery papers as a key priority. It has recently completed an analysis of material flows for Office White, Packaging and Newspaper grades and volumes of these materials being used by member companies in different points in the supply chain to inform future programs.

The Plastics and Chemicals Industry Association (PACIA) provides an annual report on plastics consumption, use and recovery on behalf of the sector. The Publishers National Environment Bureau (PNEB) publishes a similar report on newsprint consumption, use and recovery on behalf of the newsprint producers and publishers.

Specific commitments from sectors and organisations to support the Strategy goals and targets

There are a number of sectors which have made specific commitments to aspects of waste and litter reduction which will contribute to the targets and goals identified in the NSW Strategy. A number of these have been a direct result of partnership work with the Department of Environment and Conservation (NSW). These commitments and progress in achieving them will be reported in each Strategy Progress Report.

NSW Local government

The Department of Environment and Conservation (NSW) has been working with Local Government to develop and agree on an Action Plan that will provide a series of commitments and targets that Local Government could adopt to contribute to meeting the targets and goals identified in the NSW Strategy. The initial draft of the Action Plan has just completed the consultation phase and is expected to be finalised later this year.

Waste Infrastructure operators

Partnership programs have been negotiated with major waste infrastructure operators including Waste Service NSW, SITA Environmental Solutions and Collex Pty Ltd. This initiative aims to deliver at least 20,000 tpa additional recovery using low tech/low cost recovery opportunities for cardboard, metal and wood at a number of sites. This

opportunity was created as a result of the recent C&I landfill audit commissioned by the Department of Environment and Conservation (NSW).

Property owners

A partnership program between the Department of Environment and Conservation (NSW) and major property owners and managers, AMP Capital Investors, Colliers International and Colonial First State have committed to diverting an additional 20% of total waste from landfill across 18 major commercial sites, starting from a current baseline of 45% diversion.

PACIA

In September 2003, the Plastics and Chemicals Industry Association (PACIA) announced a commitment to the elimination of plastic waste from landfill using supply chain stewardship to achieve this. No date has been set for the achievement of this commitment. The Statement identifies a number of broad actions including regular data reporting. It has also identified barriers which will need to be overcome to progress towards the outcome. Current national packaging recovery rates are 24% with overall recovery (consumables plus durables) at 13.4%.

Australian Retailers Association

In October 2003 Environment Ministers accepted the *Retailers Code of Practice for the Management of Plastic Shopping Bags*. Industry has also agreed to:

- stop plastic bags polluting the environment and ending up in landfills and cut bag litter by 75% by 2005;
- deliver the targets proposed in its own code of practice which are:
 - 25% less light weight plastic bag use by the end of 2004;
 - 50% less use by the end of 2005; and
 - increased recycling of these bags by between 15% and 30%; and
- come up with actions for a total phase out of plastic bags in five years.

The ARA will provide regular progress reports on this, the first of which is due in July 2004.

Publishers National Environment Bureau (PNEB)

The PNEB is currently in its third national voluntary waste reduction agreement. The current agreement runs 2000-2005. The national recovery target is 74% by 2005. The recycling rate in NSW is already 77%.

Paper Recycling Action group (PRAGA)

PRAGA has issued a challenge to Australian offices to achieve 15% recovery of office paper nationally by December 2004 and 23% by December 2005. The group is developing a strategy to assist the recovery process. 2002 survey results indicate that NSW offices still have considerable room for improvement, recovering 10.3% which is on par with Queensland and Tasmania but considerably behind Victoria which is recovering 17.2%.

drumMUSTER

drumMUSTER is a national program for the collection and recycling of empty, cleaned, non-returnable crop production and on-farm animal health chemical containers. It was jointly developed by the National Farmers Federation, the National Association for Crop Production and Animal Health (Avcare), the Veterinary Manufacturers and Distributors Association, and the Australian Local Government Association. The parties are signatories to a national Industry Waste Reduction Agreement, which has set targets to:

- recover 66% of clean, empty, rinsed chemical containers; and
- supply 50% of raw materials in recyclable or returnable packaging.

In 2002-03, the scheme recovered 36% of drums sold. The recovery rate in NSW was 24%.

Vinyls Council

In November 2002, the Australian PVC industry announced a 5 year voluntary product stewardship commitment supported by 33 member companies and endorsed by the Australian Government. Commitments which will contribute to NSW Waste Strategy outcomes include:

- phase out the use of cadmium based stabilisers by Dec 2003;
- long term phase out of lead based stabilisers; and
- a policy for the use of phthalate plasticisers in flexible PVC products in Australia.

A technical steering group will monitor and report progress though no overall progress report has been provided to date. A report *End of Life Issues with PVC in Australia* has recently been submitted to Government.

Community education and awareness

Following the success of the first three years of the Litter Prevention Program, the NSW Minister for the Environment approved a further allocation of \$2.2 million from the Waste Fund for a new public education campaign. Launched in June 2003, the new public education campaign extended the *Our Environment – It's a Living Thing* campaign, *Don't be a tosser*. The new campaign targeted littering in public places and small-scale illegal dumping activities, as well as littering from vehicles.

Twenty-four litter reduction grants based around the *Don't be a tosser* campaign have been provided to Councils and groups of Councils who are active in litter prevention programs and have a demonstrated commitment to education and enforcement activities. Grants have also been provided to 91 Councils and 1 Aboriginal Land Council to undertake 65 clean up projects and 69 deterrence projects, with most grants including both a clean up and a deterrence component.

The Department of Environment and Conservation (NSW) also carried out the first phase of an education campaign targeting landowners and waste transporters who seek or transport fill. The campaign *Is That Fill Legal?* highlights the need for those seeking fill to be vigilant in ensuring it is clean and suitable for its purpose, and that Council and EPA approvals have been sought where applicable.

Our Environment - It's a Living Thing is the NSW Government's overarching environment education program. The program aims to improve the environment by educating and motivating people towards adopting sustainable lifestyles and providing ongoing information about practical environmental choices: at work, home and play.

Our Environment - It's a Living encourages small but important personal everyday behavioural changes which benefit both the local and global environment and

acknowledge the importance of meeting the needs of the current generation without reducing the quality of life for future generations. Launched in June 2001, the program has six key elements: overarching brand; advertising; community education; partnerships; Internet strategy; and research & evaluation.

Waste has been a major focus of the program and the advertising campaign has included messages about reducing waste in the workplace, reusing things around the home and reducing paper waste in the office. Each of these messages promoted easy actions that people can include in their everyday lives.

Education partnerships

Sustainable Schools

The Department of Environment and Conservation (NSW)'s Sustainable Schools program supports personal responsibility, eco-sustainability and community responsibility in NSW schools as part of the *Learning for Sustainability* environmental education plan. Building on earlier development work and pilot projects, the program is focussed on ensuring a co-ordinated and integrated approach to long-term sustainability, including the implementation of school environment management plans. A joint initiative between the Department of Environment and Conservation (NSW) and the Department of Education & Training, the program is underway in 200 schools across NSW. Twenty-seven part-time staff have been employed to assist schools and teachers. A Joint Agency Support group of relevant State Government Departments has also been formed to co-ordinate input and assistance to schools.

Sustainable Construction

As part of its work to support the improvement of sustainability practices in the construction industry, the Department of Environment and Conservation (NSW) developed the Materials Selection and Waste & Recyclables categories of the Building Sustainability Index, or BASIX. The residential rating tool is an initiative of the NSW Department of Infrastructure, Planning and Natural Resources. This tool is currently being trialled and early findings suggest the strong potential for major improvements in the sustainability of new buildings.

Reducing contamination in kerbside recycling

In a collaborative program involving government, Councils and industry⁵⁵, a character called Murfy was developed to lead a range of education materials aimed at helping Councils reduce contamination in recycling. The materials were developed during a two-year pilot education program and a CD of materials has now been distributed to all Councils.

The Murfy concept attempts to teach people more about recycling, and in particular why it's important to avoid contamination of the process. Murfy tells the community what happens after materials are collected at kerbside and introduces them to Materials Recovery Facilities (MRFs) where recyclables are sorted.

Beverage Industry Environment Council (BIEC) programs

The Beverage Industry Environmental Council (BIEC) works with the community, Local Government, State & Federal governments and other industry environment groups, through waste minimisation, research and development, and product stewardship programs.

⁵⁵ NSW Jurisdictional Recycling Group, Beverage Industry Environment Council, Publishers National Environment Bureau, Coca-Cola Amatil, Norske Skog, Plastics and Chemicals Industries Association, Dairy Farmers, Visy Recycling, Camden Council, Campbelltown City Council, Wollondilly Shire Council, Wingecarribee Shire Council, Resource NSW, Waste Service NSW and Centre for Environmental Solutions (C4ES)

A wide range of programs and initiatives are designed to:

- maximise kerbside recycling rates including reducing contamination levels, developing sustainable solutions to local waste management issues and working collaboratively to improve the economic efficiency of waste management systems;
- develop litter management systems that assist Councils to optimise their infrastructure performance in highly littered sites, providing litter management training for Council waste educators and environmental officers, preventing littering at public events and minimising littering behaviour in people's day-to-day activities; and
- liaise with state government regulators about common waste management issues.

Keep Australia Beautiful Council (KABC) programs

The Keep Australia Beautiful Council works with Local Governments, businesses, community groups and committed individuals. It encourages a statewide network of grassroots volunteers working towards a cleaner environment, better resource management and community beautification. Programs, which encourage cleaner communities and waste reduction, include the Waste Watchers Schools program, the Clean Beach Challenge, Tidy Towns and metro pride.

Planet Ark programs

Planet Ark coordinates a range of recycling programs and promotions including: National Recycling Week; greeting card recycling programs; the Recycling Near You website which provides the community with recycling services available in their local area; and various material specific campaigns supporting steel can and milk carton recycling, mobile phone recycling and plastic bag reduction.

Clean Up Australia programs

In addition to its flagship, *Clean Up Australia Day* which motivates thousands of Australians to clean up littered sites, Clean Up Australia is also assisting the Australian Retailers Association to meet its commitments relating to the reduction and phase out of plastic bags. Television and radio advertising is being used to encourage shoppers to refuse plastic bags.

For retailers, a comprehensive kit has been designed to help all retailers to start reducing plastic bag use and increase recycling. The kit contains a guide on how to refuse, reduce, reuse and recycle, staff training materials and in-store promotional items to generate action.

Ethnic Communities Sustainable Living Project

The Ethnic Communities' Sustainable Living Project is a partnership program between the Ethnic Communities' Council and the Department of Environment and Conservation (NSW).

The program employs a team of bilingual community educators who work with the Arabic, Chinese, Greek, Italian, former Yugoslav Republic of Macedonia, Korean, Spanish and Vietnamese communities. The aim is to increase the knowledge and skills within these communities and support them in changing their practices for sustainable living. It is an holistic approach to issues of waste, storm water, water and energy conservation, and chemical use. The educators also work through other programs and projects in the Department, to edit translated materials (e.g., the Household Hazardous Waste Communication Campaign), conduct interviews with the ethnic media (e.g., on the Litter

Campaign) and provide advice on developing and implementing programs for culturally and linguistically diverse communities.

During 2002-03, the Department of Environment and Conservation (NSW), through the former Resource NSW, worked with several ethnic communities to design and deliver culturally appropriate and targeted programs on waste avoidance and resource recovery. The bilingual educators conducted 207 face-to-face information sessions with approximately 4,000 people in settings as diverse as temples and churches, neighbourhood centres, Migrant Resource Centres and community halls.

In some Local Government Areas of Sydney, more than half the population speaks a language other than English at home. The Department of Environment and Conservation (NSW) ran workshops for Councils which covered the latest social research, how to access ethnic community groups, case studies of good practice and how to plan a program for ethnic communities in local environment protection. A resource kit of materials for Councils is also being developed.

Easy Guides to Recycling, Natural Cleaning, Composting, Worm Farming and Mulching have been developed to show how householders how to adopt sustainable every day practices. This year the series became even more accessible after being translated into eight community languages: Arabic, Chinese, Greek, Italian, Korean, Macedonian, Spanish and Vietnamese.

Supporting new markets for recycled materials

RTA using recycled content materials

The Department of Environment and Conservation (NSW), through the former Resource NSW, has established a collaborative partnership with the Roads and Traffic Authority (RTA) and construction industry partners on ways to increase the use of recycled materials in their infrastructure and decrease their waste. An agreement has been reached aimed at facilitating innovative research and trials leading to commercialization of new materials and/or processes, including the recovery and reuse of timber generated from bridge upgrades and the use of residue glass fines as a cement substitute in concrete.

Local Government Buy Recycled Alliance

The Department has supported a venture with the Local Government and Shires Associations of NSW to establish a Local Government Buy Recycled Alliance. Modelled on a similar program funded by EcoRecycle Victoria, the Alliance will assist Councils to source and purchase a wide range of recycled content products and materials across the full scope of Council activity, including office products, road-making and construction works, environmental restoration as well as landscaping and parks and gardens maintenance. The Alliance will provide guidelines, specifications and product information, and serve as an access point for suppliers of recycled content products wishing to sell products to Councils. The program was launched in November 2003 and has a website at www.buyrecycled.org.au

New Local Government specification to drive recycled purchases

Following the release of the final *GreenSpec* for the use of recycled materials in pavements, earthworks and drainage (see Part 2), five *GreenSpec* case study projects are underway to provide Councils with experience in using the materials while also showcasing the advantages of using recycled materials as outlined in the specification.

Recovering wood waste

As much as 350,000 tonnes of wood waste is being sent to landfill each year. The Wood Waste Recovery Network is helping diverse parties work together to develop an integrated network of businesses generating wood waste, landfills disposing of wood waste and businesses able to use 'in spec' products derived from wood waste. This project has helped to move more than 40,000 tonnes to market for reuse and recycling.

Growing markets for recycled organic materials

There are already a number of commercially operated, large-scale facilities converting organic materials diverted from the waste stream into quality recycled organics products for use in a range of horticultural and agricultural industries in NSW. But we still need to create more markets.

The viticulture industry has been identified as a major potential user of recycled organics. Expansion of this market has been boosted by a successful trial co-composting grape marc with two different organic products sourced from composting facilities as well as a dedicated program of research and development with the industry. The grape marc trial was conducted at The Rothbury Estate (Fosters Group) vineyard in the Hunter Valley. A guide to assist the industry in recycling grape marc and the use of organic products sourced from composting facilities is now available. In addition a number of major wine grower associations have been engaged in research to develop product specifications for recycled organics to specifically suit the needs of this sector.

A Compliance Agreement between the recycled organics industry and NSW Agriculture has been developed to ensure that certified suppliers under the protocol can safely supply the wine industry without the risk of transferring the grape vine aphid, Phylloxera, during the process. This was previously a major barrier to the increased use of recycled organic products in viticultural regions in NSW and the agreement will ensure that quality recycled organic products used in viticulture are free of this insect, enabling the organics processing industry to access significant demand in this market.

With the growing impact of soil salinity on agricultural land and regional infrastructure, another major focus has been to investigate the potential of recycled organics products to help reduce the effect of salinity. Demonstrated impact on salt affected areas has the potential to open up large markets for recycled organic products. The performance of recycled organics products, used in conjunction with salt tolerant vegetation, is being trialed at Murrumbateman, Wallendbeen, Bevandale and Berrigan / Wakool.

The Recycled Organics Unit at the University of NSW, funded through a Memorandum of Understanding with the Department of Environment and Conservation (NSW) has completed a comprehensive study of the life cycle of windrow composting systems. This study has established that source separated collection and windrow composting of organic materials to produce recycled organic products provide a significant benefit to the environment. The research will provide further impetus for the development of new markets and collection infrastructure for recovering organic materials otherwise lost to landfill.

Glass fines work

Breakage of glass in the recycling system into pieces too small to sort and use is an important issue affecting the community's perception of recycling as well as being a disposal cost to Materials Recovery Facility operators and Councils. A research program is underway aimed at increasing the use/markets for glass fines generated during the collection, transport and sorting of recyclables. The project is jointly funded by the NSW Government and industry under the National Packaging Covenant.

Improved waste management and resource recovery systems and practices

Office towers and shopping centres

Half of Sydney's waste is generated by the commercial and industrial sector. A partnership approach between the Department of Environment and Conservation (NSW) and the commercial property management industry has been undertaken to promote improved office recycling. Initially this approach targeted individual buildings, but since mid-2003 it has aimed at reducing waste across portfolios of commercial holdings in the Sydney region. Existing waste management practices are reviewed to help develop the on-ground skills, operational guidelines, policies and standards for efficient and effective waste avoidance and recycling systems.

Focussing on improving waste management systems of up to 350,000 square metres of office space for each partner, the aim is to divert 800 to 1200 tonnes from landfill in the first year alone, and deliver annual savings of between \$100,000 and \$150,000 for each company once fully implemented.

The first major partnership was negotiated with AMP Capital Investors, and was launched in July 2003. On-ground and strategic activities commenced mid-year and are now seeing the implementation of operational and strategic changes that are increasing resource recovery across the selected portfolio. Further partnerships were entered into with Colliers International and Colonial First State Property during the latter half of 2003, with operational and strategic activities with these partners now underway. Importantly, the relationships and understanding of the dynamics of this industry gained during the partnership process are paving the way towards a strategy of 'market transformation' of this sector's supply-chain with regard to increased resource recovery and waste avoidance.

Local Council Improved Practice Resource Recovery

The Department of Environment and Conservation (NSW) has developed a multi-staged Improved Practice Resource Recovery program in consultation with Local Councils and their Waste Managers. The program is designed to support all NSW Councils to maximise resource recovery from the domestic waste stream. Information and support tools will ultimately enable Councils to review and evaluate the performance of their systems as well as to design, develop and commission new services that incorporate improved practice. Key components of the program include the establishment of: performance bands and other information to assist Councils review service performance; model contracts; task lists, process timelines and critical decision points for tendering and tender evaluation; and timelines and considerations for service commissioning.

A range of programs has been jointly funded by the NSW Government and industry under the National Packaging Covenant to improve kerbside recycling systems (see section below).

Public Place Recycling

The Department's programs have included promoting a standardised approach to public place recycling – including a consistency of recycling bin colour, signage, shape and location. The Department has developed draft guidelines for managers of public places. Putting the draft guidelines into practice, the Department worked in partnership with the Sydney Olympic Park Authority to revamp their recycling systems and work is underway to upgrade recycling systems at six different NSW National Parks & Wildlife Service sites. Substantial work was also done in partnership with State Rail Authority to introduce public place recycling, however, current security concerns limit the extent to which roll-out can occur across the network.

Alternative Waste Technologies (AWT) Assessment Tool

The Department of Environment and Conservation has developed an AWT Assessment Tool and Handbook to assist Councils with decisions about the adoption and selection of suitable technologies. The AWT Assessment Tool is supported by a training program and 39 council staff have attended training so far.

Expanding recycling services

New recycling services for commercial premises along the south coast of NSW have been developed following the dissemination of results of an extensive survey of commercial premises in the area conducted by the former Resource NSW. The survey was developed to gauge the willingness of businesses within the region to pay for recycling services and to estimate their generation of recyclable glass, plastic, aluminium, steel, paper and cardboard. This information was provided to prospective collectors and reprocessors of these materials in regional meetings of common interest groups. These service providers have used the information to provide expanded collection options to commercial premises throughout the region.

Social and other research to understand community/sectoral attitudes, motivations and practices

Social research has been undertaken to inform program development in the following areas:

- household attitudes and behaviour to household chemicals;
- attitudes and behaviour to illegal dumping in multi unit dwellings;
- attitudes to purchasing products with recycled content; and
- consumer attitudes and behaviour when purchasing packaging (joint industry/government project under the National Packaging Covenant)

The results of some of these studies are provided in Part 2.

Industry/sector partnerships to improve production processes, product redesign and systems to minimise waste

Cleaner Industry partnerships

Preliminary data on the outcomes to date of eight of the twenty-nine approved projects is revealing impressive cleaner production outcomes. There has been genuine engagement from those industries involved which is delivering real cost savings to industry as well as substantial environmental benefits, many related to resource use and waste reduction.

Examples of outcomes include:

- substitution of toxic raw materials with environmentally benign inputs;
- waste avoidance and reuse and improved supply chain relationships resulting in the diversion of many tonnes of waste from landfill (Metals industry);
- the recycling of 500 tonnes of aluminium swarf;
- a waste paper sorting and extraction system is being introduced at a cost of about \$40,000, with an expected payback period of 3-4 years from income from waste paper. Special benches have been installed beside presses with two separate waste shoots to sort waste (Printers);

- by redesigning procedures to segregate waste and ensure ink packages are correctly emptied and stored, raw material waste has been minimised and disposal costs have been cut by 25%; and
- Concrete Waste Separation Units trialled at more than 55 building sites throughout Sydney, have successfully recycled 344 tonnes of solid concrete waste and companies trialling the units have identified more than \$10,000 in cost savings per annum. As well, the units have allowed the collection and safe disposal of more than 18,000 litres of contaminated water.

Old Computer equipment

Recycle IT! pilot

A pilot computer recycling project was run in 8 Western Sydney LGAs between November 2002 and March 2003. The pilot was a joint initiative between government and industry to test the feasibility and costs of running collection sites/centres for computers and electronic equipment. Seven permanent sites and 6 special collection events were used and a total of 6383 items were collected from the sites

Monitors (CRTs – 2195 units) + Hard Drive boxes (CPUs – 1627 units) represented approximately 60% of the total equipment collected by number of items and almost 75% by weight. 677 different brands were collected, with approximately 45% of equipment collected no longer having a parent company trading. The average age of the collected equipment was between 9 and 13 years old.

Most of the 49 tonnes of equipment in the trial was either recovered for reuse or recycling within Australia and in the Phillipines. The pilot has also provided valuable information for the computer industry to consider ongoing recovery of equipment. For example, the predicted cost to process equipment in a Sydney or Melbourne wide system is: \$9 – \$17 per item or \$0.80 - \$1.90 per kilogram

Reconnect NSW

In February 2003, the NSW Government introduced the *ReConnect.nsw Computer Program* to enable the donation of redundant Government agency computers to not-for profit organisations and disadvantaged individuals. Apart from the social benefits, the program provides an environmentally responsible disposal option for redundant computers.

The NSW Government Computer Reuse Program Reference Group developed a delivery model, including a set of minimum specifications for the type of computers suited to the program. A 12-month pilot has been completed using five existing computer refurbishing organisations located in both metropolitan and regional areas of NSW. It is anticipated that the results of a program review will be available in the coming months.

Safe storage and disposal of household and agricultural chemicals

Household chemical collections

Strong support has been shown by the community for the first year of a collection program for household chemicals run by the Department of Environment and Conservation (NSW) in partnership with Councils. Local Councils are providing convenient weekend drop off centres and the Department contracts the technical expertise which supervises the collections and ensures the chemicals are properly treated and disposed of. The Department is providing a special Clean Out hotline (1300 787 870) to assist Councils in handling enquiries about household chemicals. It also provides advertising in local press

on behalf of Local Councils and brochures which are available in English as well as eight community languages including Chinese, Arabic and Greek.

Stored incorrectly household chemicals can be dangerous, and without proper disposal they pose a threat to the environment. We need to stop chemicals like paints, pesticides and motor oils from entering the stormwater and sewerage systems, but we also want to divert these materials from the general waste stream, where they reduce the potential to recycle and reuse materials.

Agricultural and veterinary chemicals & containers

Unwanted stocks of agricultural/veterinary chemicals can pose serious risks to the environment and human health. A national program funded by State and Commonwealth Governments, called ChemCollect, provided for the collection, storage and destruction of hazardous, unwanted and unregistered agricultural and veterinary chemicals.

In 1999, industry committed to replace this scheme with its own scheme, called ChemClear. The ChemClear Advisory Committee advised in July 2003 that Agsafe⁵⁶ would be responsible for implementing ChemClear in the first instance, beginning with a trial at two locations in NSW from October 2003 and a progressive roll out of the full program from January 2004.

Agricultural and veterinary chemical containers recycled through another program, drumMUSTER, are used to make recycled products such as garbage bins, outdoor furniture, roadside posts, drainage and irrigation pipes, railways sleepers and fences.

The drumMUSTER program provides for the collection, recycling or disposal of pesticide containers over 1 kilogram or 1 litre in size manufactured by participants in the program. A levy of 4 cents per kilogram or litre is paid by consumers at the point of purchase for the collection, recycling or appropriate disposal of non-returnable containers. The program has recently received Australian Competition and Consumer Commission approval to extend its coverage to non-hazardous product containers and those with a capacity of less than one kilogram or litre.

National Packaging Covenant state based programs

The NSW Jurisdictional Recycling Group (JRG) was created under the National Packaging Covenant to develop and deliver projects to improve kerbside recycling efficiencies in NSW. It has members from State Government and industry and observers from Local Government.

Projects are jointly funded by the NSW Government and the packaging industry. The JRG has developed and implemented 14 programs which include: establishment of good practice and performance measures for kerbside recycling; development of best practice glass compaction rates and systems; comparative analysis of the performance of kerbside systems; education and market development projects concentrating on glass fines; and education programs tackling contamination and use of collected recyclables. It has also developed a comprehensive data base on packaging materials which covers uses, recyclability, markets and characteristics; a transport logistics model to assist regional Councils to develop optimum delivery aggregation and systems for dry recyclables; and social research into consumer behaviour and attitudes to packaging. Further details of these programs are included in relevant parts of this report⁵⁷.

⁵⁶ Agsafe is an industry initiated co-regulatory stewardship program for Avcare members to support risk management and workplace safety practices by individuals on production as well as distribution sites. All Avcare members must participate in Agsafe. Agsafe is a fully owned subsidiary company of Avcare and is governed by a Board comprising representatives of Avcare, the National Farmers Federation, the Veterinary Manufacturers and Distributors Association and an independent Agsafe representative.

⁵⁷ Details of the JRG projects can be found at: www.nswjrg.com.au.

The Department of Environment and Conservation (NSW) provides secretariat support to the JRG as well as membership of the JRG and its national counterpart, the Kerbside Recycling Group.

Supporting new technologies and practices (R&D grants program)

A Research and Development Grants Program was initiated using funding from the Waste Fund. The Program sought proposals which targeted barriers to increased recovery of specific resources, developed and tested best practice models or addressed market development issues impacting the greater uptake of recovered and recycled resources. Coordinated by the Department of Environment and Conservation (NSW), more than two million dollars has been awarded to a range of companies and research institutions.

The projects represent a diverse range of projects including: work on bio-filtration of landfill methane gas using recycled organics; optimising paper recovery at Materials Recovery Facilities (MRF); integrated recovery of construction materials at a dry recyclables MRF; a grease trap waste co-generation facility; increasing market demand for stormwater management products made from recycled organics; a portable bio-fertiliser production facility; a feasibility study on increasing textile recycling; recycling of SPA from disposable nappies in compost/mulch applications; and research into an integrated bio-system for rural towns.

Forging partnerships

In addition to specific programs described in other sections, strong links continue to be built with industry and business organisations through membership and participation in programs and regular discussion. Key organisations include:

- Waste Management Association of Australia
- Waste Management Association of Australia, C&D Recycling Division;
- Waste Management Association of Australia, COMPOST NSW
- Waste Management Association, Energy from Waste Division
- Paper Recovery Action Group of Australia
- Hunter Business Chamber
- Regional Waste Educators Network
- Total Environment Centre and Nature Conservation Council
- Local Government Association and Local Government Shires Association of NSW
- Australian Industry Group
- The Australian Institute of Purchasing and Materials Management
- Publishers National Environment Bureau
- Australian Council of Recyclers Inc.
- Australian Information Industry Association
- Australian Electrical and Electronic Manufacturers' Association of Australia Ltd
- Consumer Electronics Suppliers' Association
- Buy Recycled Business Alliance
- Master Builders' Association
- Housing Industry Association
- Institute of Public Works Engineers Australia

- Beverage Industry Environment Council
- Royal Australian Institute of Architects
- Commonwealth Scientific & Industrial Research Organisation
- Australian Tyre Recyclers Association
- Joint Working Group for Tyres

Regional Waste Groups and regional approaches (regional programs, cooperation and outcomes)

Voluntary regional waste groups have established themselves across NSW, supporting regional and local initiatives. The Department of Environment and Conservation (NSW) has provided support to each regional group in the development and initial implementation of regional waste management and resource recovery plans. Overall funding support in excess of \$1 million has been provided to support groups to deliver locally focussed waste reduction and resource recovery programs subject to the achievement of agreed program milestones. Details of the work of each group is provided below:

Midwaste

Midwaste set out to approach regional waste minimisation and resource recovery in a systematic way. It has gathered data, surveyed its communities and developed local and regional strategies that link directly to the Strategy. Programs have been developed that will provide a firm foundation and launching platform to achieve real and sustainable gains in waste minimisation and resource recovery.

Work on waste infrastructure sharing across the region has the potential to recover in excess of 20,000 tonnes per annum of recyclables and organics. A market investigation into organics has identified opportunities for alternate uses for wood waste and green waste, especially for those Councils without access to regional organics recycling facilities.

Investigation into the true cost of landfilling has provided cost comparisons to support alternative waste technologies with the potential for substantial diversions of waste going to landfill. A regional education program and website is also supporting a waste minimisation culture across the community with measurable gains in recycling and resource recovery.

The Department of Environment and Conservation has also funded a regional Waste Management Strategy with Coffs Harbour, Bellingen and Nambucca Councils to analyse current recycling, waste management and available infrastructure in the three LGAs. This has included extensive community consultation and analysis of viable waste management options.

Murray Regional Organisation of Councils (MUROC)

Murray ROC has commenced the implementation of its initial waste strategy. The appointment of a new officer in April 2004 has assisted the preparation of regional tenders for the collection of waste, organics and hazardous waste. Albury City Council is now a member of the Murray ROC.

NetWaste

The NetWaste region has been particularly active in community education with the development of a Waste to Art Project; student mentoring programs in Blayney and Gulargambone public schools; plastic bag reduction programs; ongoing promotions at

regional field days and shows; and initial planning for the development of a region- wide multi media awareness campaign to support the initial household hazardous/ChemClear joint chemical collection in August 2004.

NetWaste is working to further develop resource management networks with both State and Federal governments and other stakeholders and has been successful in attracting significant Federal funding for the installation of used oil collection facilities in sixteen regional councils. This work will be completed by November 2004 and will be complemented by a regional used oil management plan, incorporating joint collection contracts. Partnerships have also been achieved between NetWaste and the NSW Country Women's Association in respect of the plastic bag reduction program.

Tenders will be sought in June 2004 for the provision of regional metals collection and household organics processing services. The third of four sub regional waste/resource management plans has now been completed and work has commenced on the development of the fourth plan covering western councils.

A successful Small Landfill Management Workshop was held in May 2004, attended by representatives from 18 NetWaste councils. Outcomes included the development, together with DEC, WMAA and other stakeholders, of practical management guidelines for regional councils.

North East Waste Forum (NEWF)

NEWF has now completed a full review of its operations and structure while still working to complete all milestones as outlined under its regional waste plan. Two hazardous waste stores have been built in Grafton and Lismore to keep household hazardous waste out of landfill sites. The stores will service the entire NEWF region. Residents will be able to take up to 20 litres of common household chemicals to the stores for disposal free of charge.

Training continues across the region for hazardous waste, waste legislation, nuisance, waste separation, OH&S, leachate, landfill gas and sharps disposal and management.

NEWF councils have now adopted a regional approach to green waste shredding with a collective contract. Councils can still negotiate their preferences in site selection, frequency, quantities, contamination and size and quality of product, which is negotiated with the contractor. The completion of a quantitative data project in July 2004 will see the establishment of baseline diversion and program tonnage figures suitable for benchmarking performance.

Northern Inland Regional Waste (NIRW)

The Northern Inland Regional Waste Group is delivering a range of programs covering metal waste, green waste, drumMUSTER, chemical collection, illegal dumping and litter reduction. Working towards agreed milestones, the NIRW Group successfully diverted 2800 tonnes of metal waste, 33,000 tonnes of green waste and 110 tonnes of agricultural and veterinary chemical containers from landfill.

With the New England/ North West area's strong tradition as a host of festivals and rural field days, work is also underway to develop consistent litter reduction signage and training for regional Council staff on public place and public event recycling.

Riverina Eastern Regional Organisation of Councils (REROC)

REROC has established a number of successful programs throughout the region. A schools program has commenced Waste to Art with support from private sponsorship and a regional lunchbox waste reduction initiative runs in 76 schools.

9,601kg of hazardous waste have been collected with 4,897kg coming from local businesses and 4,704kg from local residents. Community support and the value of such

regional projects is illustrated by reports of one customer who missed the collection day in Cootamundra and then drove approximately 150km round trip to dispose of chemicals in Gundagai; another at Wagga Wagga came from Albury, a 200km round trip; and a Griffith farmer attended the collection in West Wyalong.

With eleven common oil collection facilities now coordinated by the group, almost eighteen thousand litres of used oil have been collected. Common signage is now installed across the region for drumMUSTER compounds and oil collection facilities. A regional oil collection contract has now commenced incorporating a six to eight week regional collection schedule.

Safe sharps disposal has been promoted to the 6 Greater Murray Health Diabetes Educators and Community Nurses, 20 veterinarians, members of the Wagga Wagga Sharps Action Group and 27 Chemists in the region. A litter trouble spot hotline was activated in February and April 2004. This database will be used for the development of the third regional waste strategy 2004-05. In a targeted tourist/holiday campaign 2,000 personal ashtrays and 5,000 car tidy bags were distributed to residents, visitors and people travelling through the region. Driver revival teams and displays included stickers, postcards, car games and posters promoting the *Don't be a Tosser* message.

Local businesses continue to partner councils and REROC in Stage 2 of its plastic bag reduction strategy. There has been a 40% reduction in the price of plastic bag alternatives as a result of the volumes being ordered, making them a more viable option. 19 businesses are now sending their paper to local recyclers.

The Smart Gardening project promotes composting, re-use of green and kitchen waste, and less water usage in gardens. The project was successfully conducted among 23 View and Garden Clubs, local councils and 31 nurseries in the region.

Prior to the development of the 2004/05 strategy all members attended a Department of Environment and Conservation (NSW) industry assessment and cleaner production workshop in May 2004.

Riverina Regional Organisation of Councils (RIVROC)

Riverina Regional Organisation of Councils (RIVROC) has completed a regional waste audit to collect data on recyclables, landfill capacities and kerbside recycling opportunities. Following this audit, RIVROC has produced a database, mapping framework, cost benefit analysis of the opportunities available in recycling, and recommendations for action.

Community promotion and education programs targeting illegal dumping, plastic bag reduction and green waste recycling have been implemented. A Hazardous Household Chemical Collection and Regional Organics Waste Management Plan will be undertaken in June 2004. Member Councils are also undertaking full-cost accounting projects on their landfills.

RIVROC also conducted a successful regional media campaign ahead of the regional drumMUSTER collection in October 2003 and May 2004.

South East Region

Co-operation between regional Councils is fostered through the South East Resource Recovery Group (SERRG) and the Regional Coordination Management Group, which bring together Local Councils, private industry and business, as well as interested community members.

Key activities and achievements in the region have included: the promotion of recycling at community events using lightweight recycling lids; and the establishment of a rural community resource recovery model in Tallaganda Shire, providing a base model for small communities throughout regional NSW.

To expand markets for household organic wastes, the Department of Environment and Conservation (NSW) and Queanbeyan City Council are jointly undertaking a series of soil improvement research projects on local farms. The Department is also continuing infrastructure protection and salinity abatement projects in the Murrumbateman and Wallendbeen areas, and further west in the Wakool and Berrigan shires.

Monitoring good practice

The Department of Environment and Conservation (NSW) is committed to the practice of maintaining and reviewing its programs and mix of tools in the light of interstate, national and international trends and practices. The Department's Sustainability Programs Division maintains this monitoring role for waste management and resource recovery. The monitoring is used to evaluate and inform new programs and to review the NSW Strategy and policy frameworks in waste.

PART 4 - PRIORITIES FOR ACTION FOR THE NEXT 12 MONTHS

Good progress has been made in the past 12 months. A solid framework is in place and programs are delivering measurable outcomes in many areas. Better data has confirmed that the focus for action over the coming 12 months needs to be:

- Working with the commercial and industrial sector to recover more material for recycling, particularly the “easy” opportunities to be had in increasing cardboard and wood recovery. The focus will be on partnerships and generic support materials and services;
- Work with industry and government to encourage increased use and purchase of environmentally friendly products and services where these are performance and price competitive. This includes the use of recycled content products;
- Work with the commercial and industrial sector to improve business and processes to further reduce environmental impacts and resource use;
- Work with Councils to support improved practice in kerbside recycling and to assist them in decision making about organics recovery, use of alternative technologies and contracting strategies;
- Engaging those sectors identified in the 2004 Extended Producer Responsibility statement in the provision of data on current performance and sectoral programs to increase recovery and improve lifecycle management of their products;
- Education and awareness programs which profile good practice in all areas including community and business sustainability programs with the aim of encouraging greater adoption of these practices; and
- Continuing to improve data and analysis to enable robust reporting and a good basis for future program planning.

Appendix 1

NSW WASTE STRATEGY TARGETS ⁵⁸

The Strategy identifies four key areas where we must achieve outcomes.

These are:

- Avoiding and preventing waste.
- Increased use of renewable and recovered materials.
- Reducing toxicity in products and materials.
- Reducing litter and illegal dumping.

Broad targets are proposed for each outcome area. These are shown in the following table. They are global targets which no single sector or group can deliver on their own. They rely on each individual, organisation, region or sector identifying the specific contribution which they can make to help achieve them.

Table 20: Broad targets for each outcome area

Outcome area	Target
Preventing and avoiding waste	To hold level the total waste generated for the next 5 years
Increased recovery and use of secondary resources	By 2014, to: Increase recovery and utilisation of materials from municipal sector from the current 26% to 66% Increase recovery and utilisation of materials from the commercial & industrial sector from the current 28% to 63% Increase recovery and utilisation of materials from the construction & demolition sector from the current 65% 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 and; where identified products containing these priority substances require disposal as a last resort, the permitted "leachability" of the substances will be reduced to the levels that are permitted for inert waste.
Reduce litter and illegal dumping	Reduce total volume and tonnages of litter reported annually. Reduction in total tonnages of illegally dumped material reported by regulatory agencies and RID squads annually.

⁵⁸ Department of Environment and Conservation (NSW): *Waste Avoidance and Resource Recovery Strategy 2003*

The **prevention of waste target** aims to hold waste generation level for the next five years. This means that in five years time, we are aiming to be generating no more waste than we were in 2000, even taking into account a projected population growth of around 1% per year and economic growth of around 2.5% per year.

The **resource recovery targets** adopted in this Strategy are the Aggressive Resource Recovery targets proposed by Tony Wright in the *Independent Public Assessment – Landfill Capacity and Demand*. Based on Wright Scenario 7, we will aim to achieve these targets over the next 12 years.⁵⁹ This means we need to increase our recovery levels according to the table below:

Table 21: Resource Recovery Targets

Stream	Current resource recovery	Aggressive scenario recovery (by 2014)
Municipal	26%	66%
C & I	28%	63%
C & D	65%	76%

The **reduction of potentially toxic substances target** is important as small amounts can cause serious and ongoing environmental damage. Specifically, we are aiming to phase out priority substances in identified products as a first choice. If this is not possible, we need to achieve maximum recovery for re-use, and where identified products containing these priority substances require disposal as a last resort, the permitted “leachability” of the substances will be reduced to the levels that are permitted⁶⁰ for inert waste.

Initially, the focus will be on a small number of priority substances, particularly those which, if mixed in with other wastes, potentially block or limit the recovery and recycling of the whole stream. These will be established through robust research managed by a cross sectoral advisory group.

Less litter and illegal dumping does not have a quantitative target since an accurate picture of the amounts of litter and illegal dumping is not yet available. A methodology for measuring and reporting on litter has just been finalised. This will be used to benchmark our current performance and establish targets. Further work is also needed on measuring illegal dumping and measuring the effectiveness of the various strategies to tackle litter and illegal dumping.

⁵⁹ Wright 2000. Scheme 7 estimates 6-year intervals to move from our current situation to the improved scenario and then a further 6 years from improved to the aggressive scenario.

⁶⁰ As published by the EPA

Appendix 2

NSW COMPANY ACHIEVEMENTS CITED IN ACTION PLAN REPORTS UNDER THE NATIONAL PACKAGING COVENANT

Signatory Action Plans under the National Packaging Covenant typically cover a range of the following areas – packaging design, packaging production, distribution and logistics, education, data collection and labelling.

One of the shortcomings of the current Action Plan model is an inability to aggregate the overall contribution to packaging waste avoidance or reduction, increase in materials recycled and reduced disposal. However, an industry review of the Action plans and Annual reports of 93 major NSW signatories has provided an aggregated list of actions which have resulted in packaging re-design and less use of materials. For example, the review noted actions that have resulted in lighter weight packaging with greater recyclability, as well as total packaging reduction and on-site waste reduction. These are listed below.

Lightweighting & Reduction

- 17% reduction in outers
- reductions in 40 tonnes of packaging material per annum from packaging trials
- down gauging of paper cores by 25% for kitchen tidy bags; decreased overall virgin board consumption by 6 tonnes/year
- Undertook number of packaging light weighting projects including reductions in 1L and 500 ml PET bottles saving approximately 230 tonnes of packaging material per annum. Eleven packaging components have been light weighted and five projects still in progress.
- Changed instant coffee from sachets to tear sticks reducing laminate by 40%
- Change to shorter sugar sticks resulted in 20% reduction per stick
- 8% weight reduction packaging for oven-baked snacks.
- 2.5% weight reduction for soups
- 15% reduction in plastic through light weighting of film
- Removal of PS tray for 3 million birds sold per annum - now just use shrink wrap
- Nappy Poly Bags – film conversion - saving of 97 tonnes/yr (22.5%) of PE resin
- Poly bundle film down gauging using stiffer resin technology - Material saving of 117 tonnes/yr (21%)
- Polybag film reduction via product size reduction and down gauging-overall Personal Care calculation - Saved 121 tonnes/yr of polybag film via product resizing and down gauging 2002 YTD vs Y2000
- Corrugated board reduction via product resizing –overall Personal Care calculation Saved 380 tonnes/yr of corrugated board via product resizing and down gauging. 2002 YTD vs Y2000
- Bath Tissue and towel products secondary packaging converted to poly bundle film saving 5769 tonnes of packaging material weight/yr. Optimised Safety factors for all corrugated fibreboard boxes ensuring lowest gsm yet functional packaging.

- Implemented a cluster pack in place of the existing basket pack and has resulted in a saving of 558 tonnes of cardboard in the 9 months to 30th June, 2002.
- Downgaged 60% of squeeze bottles by 8%
- Reduced gauge of all pet foods by 5%
- Kantong bowl sleeves reduced by 18%
- Bottled wine is now stored in wooden crates until ready for sale rather than box them in maturation cartons that are disposed of once final labelling is done.
- 11% reduction in amount of process packaging waste
- Changed the printing colour on white kitchen tidy bags to enable the scrap to be recycled into the white bag as the faint bluish hue actually makes the bag look whiter. Now recycling 5% scrap as repro into white high-density bags. This translates to a monthly consumption of approximately 5 tonnes of scrap. Extended to low density garbage bags in 2003 with 12% recycled content or 144 tonnes of recycled content per annum.
- 50% reduction in scrap cloth, created in the manufacture of cleaning cloths, has seen total scrap being reduced from 2.45% to 1.2% of manufactured product going to landfill
- Change in production methods resulted in 15% reduction in waste resins generated.
- 25% reduction in landfill resulting from changed manufacturing practices including waste separation and systems to more accurately record and reduce scrap materials
- 40% reduction in waste to landfill through introduction of waste tracking system
- 52% of waste fibre has been diverted from landfill via a dewatering process in the moulded fibre production system.
- Retooled equipment to move to a single source PP packaging system
- Diversion from landfill – Re-pelletisation of various plastics, mainly PE, PP,

Onsite

- Reduction in waste on-site of 7 tonnes/week of which 30% is due to an increase in packaging recycling
- The installation of a waste shredder has enable rejects from production to be destroyed on site and the plastic packaging recovered for recycling. This has diverted approximately 200 tonnes / year of waste from incineration.
- Production – Cardboard and plastic recycling systems have been implemented in the factory and warehouse. Approximately 216 tonnes of Polyethylene and Polypropylene each year.
- Significant reductions in waste from site - 16% reduction from 2001 to 2002
- 50% reduction in wood to landfill by signing contract with pallet maker to take away all chipboard crates and pallets. They in turn send the crates to a company that grinds the chipboard into garden compost. The pallet bases are re-cut to standard sizing and returned and used as permanent internal pallets or pallets to ship material overseas, replacing the need to buy brand new one way pallets
- 442 tonnes solid waste to landfill reduced to 60 tonnes by 2003.

Recycling

- Achieved target of recycling 80% of cardboard,
- More than 1,000 tonnes of paper fibre diverted from landfill (on top of 13,000 t/annum already recycled)
- Collection of paper and cardboard for recycling, Tissue returned to tissue mill, Wood shredded for compost
- Various waste plastic streams are collected (segregated) and sold to plastic recyclers. One mixed plastic stream is still being investigated.
- 17% reduction in waste to landfill from brewing operations
- Reduced waste from production sites by 80t/month
- Reduced point of sale materials by 17% in 2001 and 6% in 2002
- 90% of all products labelled with recycling info
- All corrugated Fibreboard boxes are collected at supermarket for return to recycled paper/packaging stream.
- Achieved target of 90% recyclable packaging by 2002
- Trialed replacement of high wet strength non-recyclable cardboard with non-recyclable cardboard but not pursued because of functional problems and negative feedback from customers
- Packaging switched from PET to cardboard.
- Life cycle assessment conducted for PP packaging.
- 85% of cartonboard manufactured from 100% recycled material
- Achieved 63% of biscuit trays in APET
- Introduced fully recycled fibre on its corrugated boxes
- Facial Tissue cartons – folding carton board - 1383 tonnes/yr of artcote grey board (80% recycled) converted to eco-cote board (100% recycled)
- 100% recycled corrugated fibreboard used where available and functional for all products.
- 100% recycled fibre board used for all Facial tissue codes