



# Quality Declaration – Waste Avoidance and Resource Recovery (WARR) Strategy

## Recycling rates

From 4 April 2011 the Department of Environment, Climate Change and Water NSW (DECCW) is known as the Office of Environment and Heritage (OEH), Department of Premier and Cabinet.

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OEH 2011/0334 ISBN 978 1 74293 248 4  
Published May 2011

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# Institutional Environment

## Data Collectors

The *Waste Avoidance and Resource Recovery Strategy Progress Report 2010* presents Waste Avoidance and Resource Recovery (WARR) recycling rates that were derived using a combination of data. The principal waste disposal data was collected by the Office of Environment and Heritage's (OEH1) Environment, Protection and Regulation group. The principal waste recovery data was collected for OEH using private contractors (MS2, Industry Edge) and national industry associations (Plastics and Chemicals Industries Association (PACIA), Waste Management Association of Australia (WMAA) and Compost Australia). Resource recovery data was also collected from Local Government councils. Most of the supplementary data used in the collation of WARR recycling rates was collected by OEH.

## Collection Authority

OEH collects mandatory monthly disposal and recovery tonnages from disposal facilities that pay the waste environment levy under s.88 of the *Protection of the Environment Operations Act 1997*. Mandatory annual waste disposal tonnages provided by waste facilities in the rest of the state are collected under the *Protection of the Environment Operations (Waste) Regulation 2005*.

Local government councils are required under NSW legislation to report annual resource recovery data. Recovery data collected through private contractor and national industry association surveys is voluntary. Contractors sign an undertaking with OEH regarding the security and confidentiality of the data collected.

## Data Compilers

Recovery data collected by private contractors and national industry associations is compiled by these bodies (aggregated data are provided to OEH). Disposal data is compiled by OEH. OEH combine disposal and recovery information to compile the final WARR recovery rates included in the WARR report. OEH is a NSW state government department.

## Confidentiality and security

### OEH

Data supplied electronically to OEH is accessible only to the user providing the data and to relevant OEH officers. Data is protected from unauthorised access. Users require a username and password to access the system and need to be authorised to view and/or edit and/or certify data. The system keeps an audit trail of all users accessing and editing reports. There is no opportunity for users to view reports or data provided by other users. Personal information provided on OEH forms is also regulated by the *Privacy and Personal Information Protection Act 1998 (NSW)*.

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1 As of 4 April 2011, the Department of Environment, Climate Change and Water is now known as the Office of Environment and Heritage, Department of Premier and Cabinet

## WMAA

Providers are informed that the data they provide:

- (i) will be kept confidential and data from an individual business will not be revealed and will be aggregated on a state basis for publication
- (ii) is confidential to the contractor and only aggregated data is supplied to OEH.

WMAA also sign an undertaking with OEH regarding the security and confidentiality of the data collected.

## Industry Edge, MS2, PACIA, Compost Australia

Providers are given assurances of the privacy of their data as determined by the contractors' Privacy policy.

## Relevance

Under the (NSW) *Waste Avoidance and Resource Recovery Act 2001*, OEH is required to report against the *Waste Avoidance and Resource Recovery Strategy (WARR)* every two years. The Act promotes waste avoidance and resource recovery in NSW and the strategy sets goals and targets which are monitored. This exercise is related only to quantifying recycling rates – not waste avoidance. Using a baseline year of 2000, the WARR strategy sets recycling targets for each of the three major waste streams and this report provides data for the 2008–09 year.

Both disposal and recovery data are required to calculate the WARR recycling rate (see 'Concepts' section). Data sources are listed below.

For disposal data:

- (i) OEH Environmental Regulation and Protection Group (EPRG): *Section 88 Waste Contributions Monthly Report* – (mandatory monthly disposal and recovery tonnages collected from disposal facilities that pay the Waste and Environment Levy)
- (ii) OEH EPRG: *Regional Waste Data System* – (Mandatory annual waste disposal tonnages provided by waste facilities in the rest of the State).

For recovery data:

- (i) OEH *NSW Reprocessing Industry Surveys 2008–09* (voluntary surveys) as listed below:
  - survey of paper reprocessors undertaken by Industry Edge on behalf of OEH
  - survey of glass reprocessors undertaken by MS2 on behalf of OEH
  - survey of C&D reprocessors undertaken by WMAA
  - survey of metals, textiles and rubber reprocessors undertaken by the WMAA
  - national survey of organics reprocessors undertaken by Compost Australia on behalf of OEH, other jurisdictions and the organics processing and recycling industry
  - national survey of plastics reprocessors undertaken by PACIA on behalf of OEH, other jurisdictions and the plastics industry (contracted to independent consultants, Hyder Consulting).

- (ii) OEH *Yearly Local Government Waste and Resource Recovery Data Return*
- (iii) OEH *Section 88 Waste Contributions Monthly Report (WCMR)*

Disposal data is recorded in a variety of ways (e.g. mixed waste, single material loads) and some estimation is required to split tonnages received at disposal facilities into component materials. OEH conduct audits of mixed waste to obtain ratios which are used to estimate these splits. A number of assumptions and extrapolations are also used to allocate reprocessing survey tonnages to a source waste stream as this source stream information is not reported by most reprocessors, a major exception being resource recovery data reported by Local Government.

The following supplementary data sources are used in the calculation of WARR recycling rates:

- (i) OEH 2011 – *Domestic Kerbside Waste and Recycling in NSW 2007–08*.  
[www.environment.nsw.gov.au/warr/datareport.htm](http://www.environment.nsw.gov.au/warr/datareport.htm)
- (ii) California Integrated Waste Management Board, California 2008 Statewide Waste Characterization Study, August 2009.
- (iii) DECCW (NSW) *2008 C&I Disposal Based Survey June/July/August 2008*  
[www.environment.nsw.gov.au/resources/warr/105WasteSurveypt1.pdf](http://www.environment.nsw.gov.au/resources/warr/105WasteSurveypt1.pdf)  
[www.environment.nsw.gov.au/resources/warr/105WasteSurveyappend.pdf](http://www.environment.nsw.gov.au/resources/warr/105WasteSurveyappend.pdf)
- (iv) DECC *Sustainable Commercial and Industrial Waste Stream Garbage Bag Survey: Final Report Dec 2008*
- (v) DECC (NSW) *2007 Report into the Construction and Demolition Waste Stream Audit 2000–05 Sydney Metropolitan Area*.  
[www.environment.nsw.gov.au/warr/cndwastestream.htm](http://www.environment.nsw.gov.au/warr/cndwastestream.htm)
- (vi) ABS 2009: 3218.0 *Regional Population Growth April 2009*.
- (vii) DECC 2008 – *Municipal Waste and Recycling in NSW 2000–01 to 2006–07. Not published.*

## Scope

### Disposal data

All NSW waste facilities report waste tonnages disposed to landfill (Note: no data is available for waste that is disposed of illegally).

### Recovery data

The WARR report aims to include data on all materials collected and moved off-site for reprocessing in NSW as an input into the overall recovery rates for the three waste streams. The report does not cover 'waste avoidance', it only records off-site recycling or reprocessing. Waste avoidance includes those reuse or recycling activities that occur on-site, e.g. a factory that uses its own process off-cuts to be reprocessed into products or householders that compost their own kitchen waste.

The main mechanism for collecting this data is the OEH (NSW) *NSW Reprocessing Industry Surveys 2008–09*. The target population is all businesses and households in NSW that reprocess/reuse waste collected in NSW or export/transfer waste collected in NSW interstate for reprocessing/reuse. However, there are a number of limitations in being able to achieve this aim. The current state of OEH's waste intelligence combined with practical difficulties in collecting data means that this survey cannot at this stage capture

recycling of every possible material, especially those avoided by on-site composting, reprocessing or reuse. Due to these limitations, the survey currently focuses on six groups of materials and the survey population is all businesses involved in reprocessing these materials during the survey period:

- Metals/textiles/rubber
- Construction and demolition
- Paper
- Glass
- Plastics
- Compost

Reprocessor survey data is supplemented by:

- (i) OEH Yearly Local Government Waste and Resource Recovery Data Return. The scope is all NSW local government councils. Data is collected from all councils that reprocess material at their facilities.
- (ii) OEH (NSW) Section 88 Waste Contributions Monthly Report (WCMR). The scope is all licensed waste facilities in the Greater Sydney Region. Data is collected on all materials recycled from landfills that are sold directly to the public or to facilities not included in the Reprocessor surveys. (No recycling data is collected from landfills outside the GSR).

## Reporting units

- Waste facilities. A waste facility is any premise used for the storage, treatment, processing, sorting or disposal of waste.
- Businesses with reprocessing or reuse activity. Note that the primary activity of these units is not always reprocessing or reuse of materials. For example in the construction industry many company's resource recovery activities are a response to handling by-products of their core business activities.
- Local government councils.

## Frame

OEH's EPRG maintain a list of all NSW waste facilities including those licensed and unlicensed.

The *NSW Reprocessing Industry Surveys 2008–09* survey frames are developed and maintained for each material type by the relevant contractor. Generally, the combined survey frame contains most relevant large businesses that are expected to account for the bulk of reprocessing activity. However, there are deficiencies in the frame. In the construction and demolition waste stream, materials reprocessed or reused on another site without first passing through a reprocessor is not captured on the frame. Similarly, some C&I materials are sent from one business to another to be used as raw materials.

## Concepts used

### Waste

The *Protection of the Environment Operations Act 1997* defines 'waste'.

The WARR Strategy focuses on solid wastes that, unless recovered and diverted to beneficial uses, would be disposed of to solid and inert waste landfills throughout NSW.

### WARR recycling rates

The WARR recycling rate for any waste stream is calculated using this formula:

$$\text{Recycling Rate of that stream} = \frac{\text{Total diverted from landfill from that stream} * 100}{\text{Total generated in that stream}} \%$$

Where: Total diverted from landfill = Total recycled, reused or reprocessed

Total Generated = Total disposed to landfill + Total diverted

### Level of Geography

WARR recycling rate data is available for NSW, the Sydney Metropolitan Area (SMA) and the Extended Regulated Area (ERA – Hunter, Central Coast and Illawarra).

### Key data items

Key data items of interest for the WARR report are total tonnages disposed, total recycled tonnages, total waste generated tonnages and the percentage recycled rate which are available by NSW, Sydney and the ERA by the three waste streams (MSW, C&I and C&D).

These key data items are mainly derived from the component data items listed below:

Disposal data items:

- Weighed Tonne Quantity
- Regulated Region Weighed Exempted Tonne
- Other Facility Tonne Quantity
- Unweighed Tonne Quantity
- Regulated Region Unweighed Exempted Tonne
- Regulated Region Rebate Deduction Tonne
- Transported Disposal Deduction Tonne
- Total Disposed Tonne

Data items are collected by region by stream (and by material in some cases).

Reprocessor Survey data items:

- Total tonnes of unprocessed (material) recovered (collected) in NSW for reprocessing during the 08–09 financial year
- Total tonnes reprocessed in NSW during the 08–09 financial year
- Total tonnes disposed to landfill due to contamination or unsuitability during the 08–09 financial year
- Total tonnes sent interstate for reprocessing during the 08–09 financial year
- Total tonnes sent overseas for reprocessing during the 08–09 financial year
- Total tonnes reused during the 2008–09 financial year

Data items are collected by material type.

## Standard Classifications

### Disposal data

The key classifications used are:

- Waste stream
- Material composition code
- Region

For purposes of reporting their data, waste facilities are classified using LGA to the following regions:

- SMA – Sydney Metropolitan Area
- ERA – Extended Regulated Area (Hunter, Central Coast and Illawarra)
- RRA – Regional Regulated Area
- Rest of NSW

RRA and Rest of NSW data are combined to create NRA data (Non regulated area) when reporting WARR recycling rates and are reported as Rest of NSW in the WARR progress Report 2010.

### Recovery data

Key classifications include:

- Material
- Region (for some surveys only)

## Timeliness

As required by the *Waste Avoidance and Resource Recovery Strategy (WARR)*, NSW recycling rates are derived every 2 years. The last WARR report covered the 2006–07 period and this report provides WARR recycling ratios for the 2008–09 period. The next report is expected to be released in 2012, providing updated recycling ratios for the 2010–11 period.

Waste disposal data collected in monthly and annual returns is aggregated and trends reported publicly in OEH Annual Reports, State of the Environment Reports and other relevant waste publications.

## Accuracy

WARR recycling rates are compiled from a number of data sources including census and sample surveys.

OEH use compositional audits to apportion waste to material type and as an input into the calculation of WARR recycling rates. These audits use sample survey methodology. Two types of error can occur in estimates that are based on a sample survey: sampling error and non-sampling error. Sampling error occurs when a sample, rather than the entire population, is surveyed. It reflects the difference between estimates based on a sample and those that would have been obtained had a census been conducted. Significant research was undertaken to select samples for the OEH compositional audits that were representative.

Non-sampling error arises from inaccuracies in collecting, recording and processing the data. Every effort was made to minimise reporting error, by the careful design of audit forms and field procedures, efficient data processing procedures and intensive training of audit field staff (or the use of experienced contractors).

Disposal data is collected by a census of NSW waste facilities. All licensed waste facilities in the GSR report tonnages disposed to landfill via the *Section 88 Waste Contributions Monthly report (WCMR)*. Tonnages are recorded using weighbridges. The majority of data is submitted on line, externally by the facility into OEH's WCMR data base. Waste facilities outside the GSR report annually via a form. OEH audit data reported by facilities using weighbridge software. Every effort is made to reduce reporting error by the careful design of collection instruments and efficient data processing techniques.

The Reprocessor Surveys are a census of all businesses that have been identified as reprocessing materials in the six target categories. For the surveys conducted by the WMAA (metals, textiles and rubber/ construction and demolition), data was collected using an on-line return. Response rates were 75 per cent or higher for these surveys, and data was adjusted to account for non-response.

The remaining Reprocessor surveys had high response rates. Data was not adjusted for non-response. These contractors design the methodology of their collections.

### Other factors affecting data accuracy

When combining a range of data sources to calculate WARR rates, a number of assumptions and extrapolations are required, for example when allocating Reprocessing survey tonnages to a source waste stream (this source stream information is not reported by most reprocessors).

In theory, WARR rates should capture recycling of every possible material. As explained, some recycling activity is not captured especially those avoided by on-site composting, reprocessing or reuse, so recycling rates are under reported.

## Coherence

Since the inception of WARR reporting, OEH have actively sought to improve the quality and scope of collected data as more intelligence on the waste and recycling industries becomes available. This has an impact which needs to be considered when analysing the time series. In the 2010 WARR report (covering the 2008–09 period), the total amount of materials reported as entering the NSW waste management system increased by 0.9 million tonnes since 2006–07, and by almost 4.5 million tonnes since 2002–03. However, about 30 per cent of the increase from 2002–03 was due to improved measurement and reporting of disposal and recycling tonnages, rather than any actual increase in tonnages. For the 2010 report, this included improved reporting from regional areas and reporting on additional material streams, such as textiles, rubber and previously unreported organics streams. This expansion in the range of materials now measured accounts for approximately 1–1.3 million tonnes of the increase in waste generation reported between 2006–07 and 2008–09. Most of the actual increases in waste generation were recycled materials.

Recycling data recorded in the WARR report may differ to that reported in OEH fact sheets based on the 2008–09 Reprocessor surveys. WARR report data includes all sources of data that can be identified, not just the materials reported by the commercial reprocessors covered in the survey.

Disposal data may differ to that reported in the OEH's *Local Government Survey report* as data in that survey, although verified to some degree, is self reported. More accurate data is obtained through facility reporting by such mechanisms as the WCMR. Levied facilities are audited via weighbridge software and can be considered accurate.

## Interpretability

Further definition of some relevant terms can be found in the *Waste Contribution Monthly report*, Section 8 'Definitions' –

[www.environment.nsw.gov.au/resources/wr/2009wcmr.pdf](http://www.environment.nsw.gov.au/resources/wr/2009wcmr.pdf)

Section 8 also contains the classification 'Material Composition Codes' and the classification of Local Government Areas by region (SMA, ERA, RRA, Rest of NSW).

A Glossary for the WARR report is contained in the publication *Waste Avoidance and Resource Recovery Strategy Progress Report 2010, Volume 2* –

[www.environment.nsw.gov.au/resources/warr/110061WARRSPRvolume2.pdf](http://www.environment.nsw.gov.au/resources/warr/110061WARRSPRvolume2.pdf)

Related published datasets:

- (i) *2009 National Plastics Recycling Survey* (link included on homepage)  
[www.pacia.org.au/Content/PlasticsRecyclingSurvey.aspx](http://www.pacia.org.au/Content/PlasticsRecyclingSurvey.aspx)
- (ii) DECCW *Glass reprocessing/reuse 2008–09* factsheet  
[www.environment.nsw.gov.au/resources/sustainbus/10212GlassReprocessing08\\_09.pdf](http://www.environment.nsw.gov.au/resources/sustainbus/10212GlassReprocessing08_09.pdf)
- (iii) DECCW *Paper reprocessing 2008–09* factsheet  
[www.environment.nsw.gov.au/resources/sustainbus/09779PaperRecovery08\\_09.pdf](http://www.environment.nsw.gov.au/resources/sustainbus/09779PaperRecovery08_09.pdf)
- (iv) DECCW *Organics reprocessing 2008–09* factsheet  
[www.environment.nsw.gov.au/resources/sustainbus/10534OrganicsReprocessing.pdf](http://www.environment.nsw.gov.au/resources/sustainbus/10534OrganicsReprocessing.pdf)

- (v) DECCW (NSW) *2008 C&I Disposal Based Survey June/July/August 2008* (includes information on audit methodology and sample collection instruments)  
[www.environment.nsw.gov.au/resources/warr/105WasteSurveypt1.pdf](http://www.environment.nsw.gov.au/resources/warr/105WasteSurveypt1.pdf)  
[www.environment.nsw.gov.au/resources/warr/105WasteSurveyappend.pdf](http://www.environment.nsw.gov.au/resources/warr/105WasteSurveyappend.pdf)
- (vi) DECC (NSW) *2007 Report into the Construction and Demolition Waste Stream Audit 2000-05 Sydney Metropolitan Area. 2008* (includes information on audit methodology)  
[www.environment.nsw.gov.au/warr/cndwastestream.htm](http://www.environment.nsw.gov.au/warr/cndwastestream.htm)
- (vii) DECC *Sustainable Commercial and Industrial Waste Stream Garbage Bag Survey: Final Report Dec 2008*
- (viii) OEH 2011 – *Domestic Kerbside Waste and Recycling in NSW 2007–08*.  
[www.environment.nsw.gov.au/warr/datareport.htm](http://www.environment.nsw.gov.au/warr/datareport.htm)
- (ix) *NSW Local Government Waste and Resources Recovery Data report 2008–09*.  
[www.environment.nsw.gov.au/warr/datareport.htm](http://www.environment.nsw.gov.au/warr/datareport.htm)

## Accessibility

The *Waste Avoidance and Resource Recovery Strategy Progress Report 2010* is available free of charge in pdf format on the OEH website. Data is aggregated for the report and data from individual companies is not available.

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