

## Appendix D. Waste

## D.1 Input feedstock assessment - Municipal waste

Table D.1 : List of Councils initially selected for input feedstock review purposes

Region	Councils initially selected
Metropolitan Melbourne	<ul style="list-style-type: none"> <li>• Bayside</li> <li>• Boroondara</li> <li>• Cardinia</li> <li>• Casey</li> <li>• Frankston</li> <li>• Glen Eira</li> <li>• Greater Dandenong</li> <li>• Kingston</li> <li>• Knox</li> <li>• Manningham</li> <li>• Maroondah</li> <li>• Stonnington</li> <li>• Monash</li> <li>• Whitehorse</li> </ul>
Gippsland	<ul style="list-style-type: none"> <li>• Bass</li> <li>• Baw</li> <li>• East Gippsland</li> <li>• Latrobe</li> <li>• South Gippsland</li> <li>• Wellington</li> </ul>

## D.2 Waste composition – Municipal Waste

The Guidelines for Auditing Kerbside Waste in Victoria provide guidance for calculating the numbers of bins to be audited for a given material type, and define primary and secondary categories of waste materials. The primary and secondary categories are shown in Table D.2. What is actually categorised in a waste audit will depend on factors such as cost, category of interest to a particular council (e.g. organics or hazardous wastes), and timeframes available to perform the audit.

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Where bespoke waste composition data was available for an individual council (audit data was available for 7 councils in total<sup>96</sup>) this data was used to build a baseline for that council. Where waste composition data was not available for an individual council, a generic state waste profile was adopted for that council. Review of available individual council audit data shows that for many Local Government Areas (LGAs), a smaller than the minimum recommended sample size of bins to be audited was often used. In addition, waste primary and secondary categories recommended by Sustainability Victoria were not always applied, or were applied in a manner that is inconsistent with the Sustainability Victoria guidelines. As such the data available to determine a typical composition of MSW (the residual waste stream) for the targeted regions is limited.

The best composition data was sourced from Greater Dandenong. The waste composition data from the Greater Dandenong Waste and Litter Strategy 2015-20 is reproduced in Figure D.1.

<sup>96</sup> Cardinia Shire Council, Frankston City Council, Greater Dandenong City Council, Knox City Council, Manningham City Council, Whitehorse City Council and Latrobe City Council.

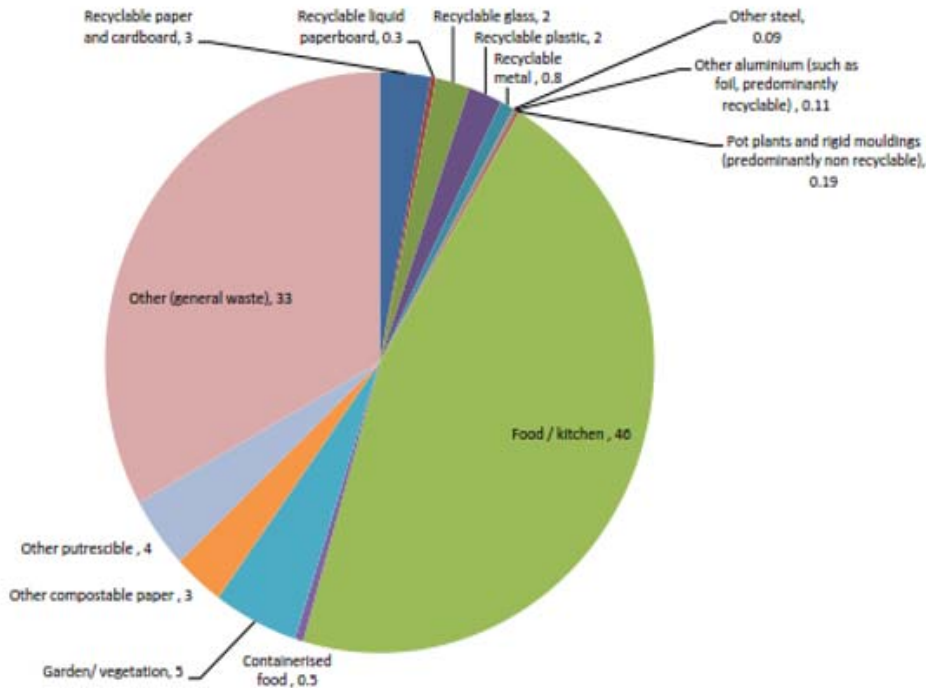


Figure D.1 : Greater Dandenong composition audit for garbage stream (% weight) for 2012

Apart from individual councils, the main source of Victorian waste composition data was Sustainability Victoria’s ‘Victorian Statewide Garbage Bin Audits: Food, Household Chemicals and Recyclables 2013 (published 2014)’. This is an extensive report that focuses on Food, Household Chemicals and Recyclables. The ‘food’ compositional audit was based on the United Kingdom Waste and Resources Action Programme (WRAP) guidelines for food waste audits (utilising 19 waste type categories), while the ‘Household Chemical’ audit followed the categories for the Get It Right On Bin Night (GIROBN) campaign (utilising 26 waste type categories). The ‘Recyclables’ audit was divided into 15 waste type categories.

The audit was completed for 8 councils (4 metropolitan and 4 non-metropolitan councils). The report does not categorise the waste within the guideline primary and secondary categories (see Table D.2) making it difficult to align with other compositional data. Additionally, the report has a number of limitations (as outlined in Section 3 and 4 of the report) which include confidence intervals of the data (the margin of error) not calculated, and audits did not account for seasonal impacts on waste generation.

Table D.2 : Primary and secondary categories from Sustainability Victoria guidelines for kerbside waste auditing

Primary category	Secondary category
Paper	Paper / Newspaper Cardboard Liquid Paperboard (LPB milk/juice) Other/Mixed
Organics compostable	Food/Kitchen/Garden Other Putrescible
Building materials	Wood/timber
Clothing/textile/fabric	Textile/rags
Glass	Packaging bottles /containers
Plastic	Other (pyrex, windscreen)

Primary category	Secondary category
Metal and Aluminium	cans/foil Steel cans/aerosol cans Other
Potentially hazardous	Paint Fluorescent globes Dry cell batteries Nappies/Hygiene products Car batteries Household chemicals Pharmaceuticals
Other	Ceramics Dust/ dirt/ rock/inert Ash Special Non-recyclable plastic film Non-recyclable hard plastic Soil Other

Given the limitations of the most recent Victorian datasets, and to establish confidence in the percentage ranges of each waste material type, a comparative review of waste compositional data available from other studies was undertaken. This review considered kerbside audit data available for groups of councils in New South Wales (kerbside audits of nine Western Sydney councils in 2011)<sup>97</sup>, waste composition reports submitted to Australian Paper by HRL in July 2017 and December 2017<sup>98</sup>, and kerbside audit data available for New Zealand.

The Western Sydney councils' kerbside audit results show that organic material (food and green waste) for these NSW councils ranges from about 30% to 50% by weight. Composition can vary depending on services offered but this variation is not significant.

The July 2017 HRL report provides a composition for the Average Melbourne MSW stream. It references the Sustainability Victoria Statewide Garbage Bin Audits (2014) and an additional Sustainability Victoria report entitled "Kerbside garbage composition: recent findings" which provides a summary of composition assessments completed for 4 councils (600 kerbside garbage bins) up to 2008. The HRL report used this Sustainability Victoria information to determine its own waste composition table. While most of the values for the different waste categories are typical, the value for food waste is high at 42% by weight but the overall percentage of organic waste at 50% is typical.

It is noteworthy to mention the Love Food Hate Waste campaign has been active in Victoria since 2014, and this is likely to have had a positive impact in reducing food waste in the MSW stream. In lieu of available food waste composition studies in Victoria since the Love Food Hate Waste campaign was initiated, New Zealand compositional audit data for 2015<sup>99</sup> has been reviewed.

The New Zealand audits were targeted to review changes to the food waste composition in kerbside garbage bins before rollout of their Love Food Hate Waste Campaign. The audit was carried out across 12 councils (a mix of urban and urban/rural areas) and collected kerbside garbage from 1,402 households. The average results give a food waste component of 30%. This is a lot lower than the 42% calculated by HRL for food waste, but is similar to the food waste component from the WSROC information.

<sup>97</sup> Western Sydney Regional Waste Avoidance and Resource Recovery Strategy 2014-2017. Summary waste audit data for 2011 for The Hills, Blacktown, Blue Mountain, Fairfield, Hawkesbury, Holroyd, Liverpool, Parramatta and Penrith Councils (publicly available / online).

<sup>98</sup> Confidential reports

<sup>99</sup> Waste Not Consulting, New Zealand Food Waste Audits – Prepared for WasteMINZ, March 2015

In general, the following observations were noted during review of this compositional data:

- For the NSW and New Zealand case studies, the food waste material generally comprises around 30% to 35% by weight of the residual waste bin.
- Food waste material makes up 42% by weight assumed composition for Average Melbourne MSW in the HRL report. While this is relatively high, the overall percentage of organic waste at 50% is typical. The high food waste value may have been due to the audit being predominately focussed on the metropolitan Melbourne area, where there is likely to be less gardening / yard waste and space for composting is limited.

Following review of all data sources (compositional data from the HRL report, the Statewide Garbage Bin Audit and various GWRRG and MWRRG councils), a composition table for the Gippsland and South East Metropolitan councils MSW residual waste stream was created as an input for the naus model. The final composition assumed for the aggregated municipal residual waste stream for the year 2020-21 is shown in Table D.3.

Table D.3 : Composition input summary table for municipal residual waste, Gippsland and South East Melbourne (Year 2020-21)

Primary Category	Secondary Categories	MSW (%)	
		Gippsland	South East Melbourne
Paper	Newspaper, Magazines/Brochures plus 11 more.	13.92	14.69
Plastic	PET #1, HDPE #2 plus 11 more.	12.65	12.63
Glass	Glass Packaging / Containers Clear, Glass Packaging / Containers Green plus 4 more.	4.62	2.82
Ferrous	Composite (mostly ferrous), Steel Packaging Food and Pet Cans plus 5 more.	2.18	1.54
Non-Ferrous	Aluminium (food cans), Aluminium beverage cans plus 5 more.	0.64	0.56
Organic (Compostables)	Food/Kitchen, Garden/Vegetation plus 2 more.	46.30	48.08
Other Organic	Textile/Rags/Carpet (Organic), Leather plus 4 more.	2.25	2.42
Earth Based	Cat Litter, Soil plus 4 more.	3.20	3.67
Miscellaneous	Miscellaneous Combustible, Miscellaneous Non-Combustible plus 1 more.	6.43	6.04
Waste Electronic	Electrical Items: Large, TV's & Monitors plus 4 more.	1.27	0.93
Hazardous	Asbestos / Building Materials, Paint plus 8 more.	2.02	1.96
Liquid	Liquid	0.00	0.00
Fines	Fines < 10mm (break out)	4.54	4.66

Note that the primary and secondary categories shown in Table D.3 differ slightly from the primary and secondary categories identified by SV for kerbside bin auditing (shown in Table D.2 ). This has been necessary as the naus model has defined categories. Table D.3 provides a summary for inputs; there are 18 primary categories and 112 secondary categories in naus that have been amalgamated to be consistent and comparable to available waste audit data.