

Recycling – How Does Australia Compare?

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1 INTRODUCTION

In recent years, Australians have been encouraged as being some of the best recyclers in the world. But how accurate is this statement really? This report was undertaken to take stock of how we really match up across a range of materials in comparison to other developed countries around the world.

This project involved a study of recycling activity internationally and a benchmarking of Australian recycling against other developed countries. Where possible, this consisted of measuring the recycling rates for given materials in given countries. This rate is defined as the amount of material collected through recycling as a proportion of the amount of material consumed per year. (In some countries or organisations, this is referred to as the collection rate or recovery rate).

With most materials, recycling is defined in the same manner across each country. For plastics, recycling is defined to include mechanical recycling and de-polymerisation methods.

Generally, waste to energy is not included in the recycling rate. For each country where possible, available data has been presented for energy recovery and composting separately to recycling.

1.1 Data Collection Methodology

Data on material recycling rates was gathered using a range of means. These included both industry and government sources. The data was drawn from a range of journals, internet sites and through direct contact with European based organisations.

For some categories, such as total paper and cardboard, comparable data has been collected and is presented from many different countries. For other categories, such as specific plastic polymers, no direct comparisons were able to be identified.

The latest available data has been used and annotated in all cases, and data more than five years old was generally not included. Most data is for the year 1999 or 2000.

The recycling rates are generally based upon actual tonnes received for processing and therefore are largely derived from the major reprocessors. In some isolated instances, the data is derived by sample auditing methods or is based on consumer surveys. The reliability of survey results is less robust and therefore the use of this form of data has been avoided where possible. (The recycling rate for the United Kingdom telephone book recycling is derived using this method.)

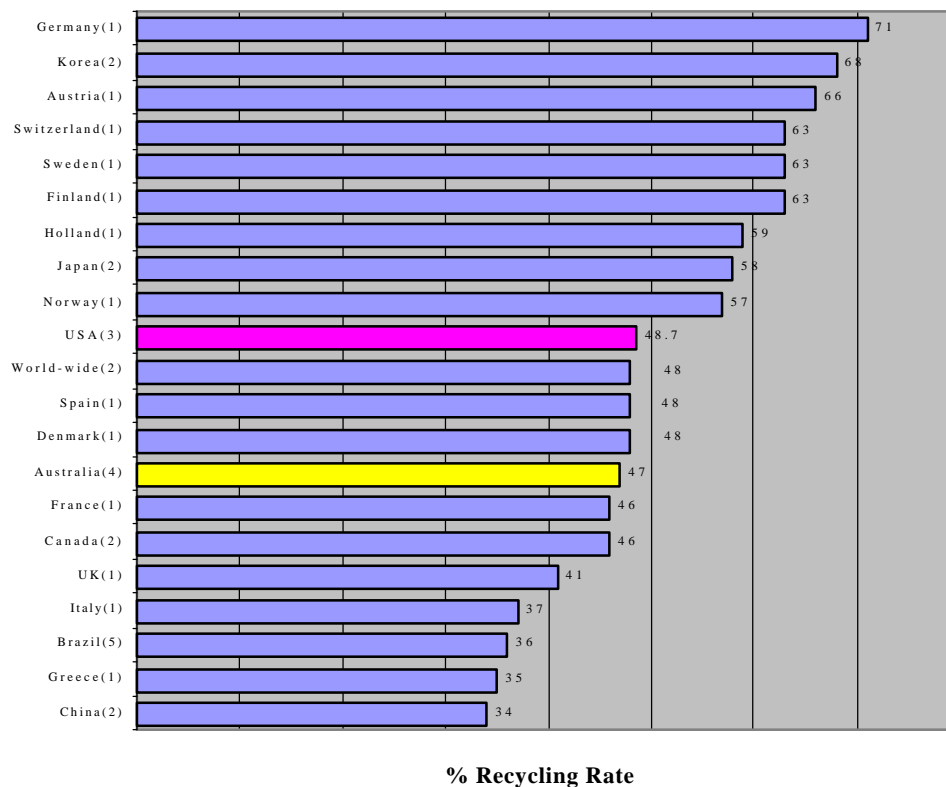
Outlined in the following chapters is a summary of the findings of each of the categories researched. All data points have been given a number detailing the references which are found in Appendix A.

2 PAPER

Most countries produce paper recycling rates only for total paper, across all grades. The primary reason for this is that reprocessing is often of mixed grades, making it difficult to identify accurately the rate for each different paper grade. Australia had a total paper recycling rate of 47% in 1999-2000 according to the Pulp and Paper Manufacturers Federation. This figure is very similar to the USA, UK, France and Canada. The recycling rate is higher in most European countries such as Germany, Holland and Sweden.

Figure 2.1 shows the recycling rates recorded for 2000 in several countries (note: Brazil is 1999 data).

Figure 2.1 - Total Paper Recycling Rate



The newspaper recycling rate in Australia was 70.1% in 2000 (PNEB), compared to 70.1% in the USA (American Forest and Paper Association). Data from other countries was unavailable.

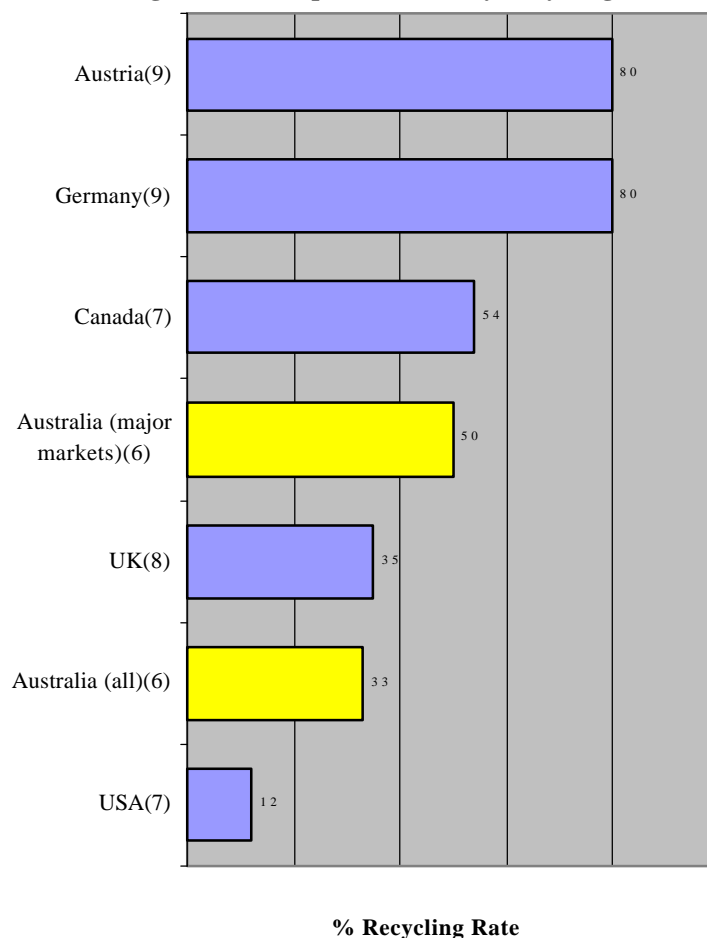
The Australian recycling rate for cardboard packaging is 72.7% (PPMFA), compared to 68.6% in Canada and Sweden 84%. Data for cardboard from other countries was not available.

3 TELEPHONE DIRECTORIES

Pacific Access, the producer of Yellow Pages and White Pages directories in Australia, in co-operation with Visy Recycling, runs a product stewardship program for the recovery and data collection of recycling rates of old telephone directories. Recovery data is complex to obtain as the directories are collected and processed with other paper grades, and extensive audits are currently undertaken to estimate recovery tonnes. Data of recovery is recorded in the major market areas where the program is run (covering approximately 70% of the Australian population). In these areas the recovery rate was 50% in 2000, and spread over the national population this represents 33% recovery.

This compares quite well to countries such as Canada and the UK where dedicated data is sought on old directory recycling. Recovery is estimated at 80% in some European countries such as Austria and Germany where paper recycling of all grades is well established. Data shown in Figure 3.1 is for the year 2000.

Figure 3.1 - Telephone Directory Recycling

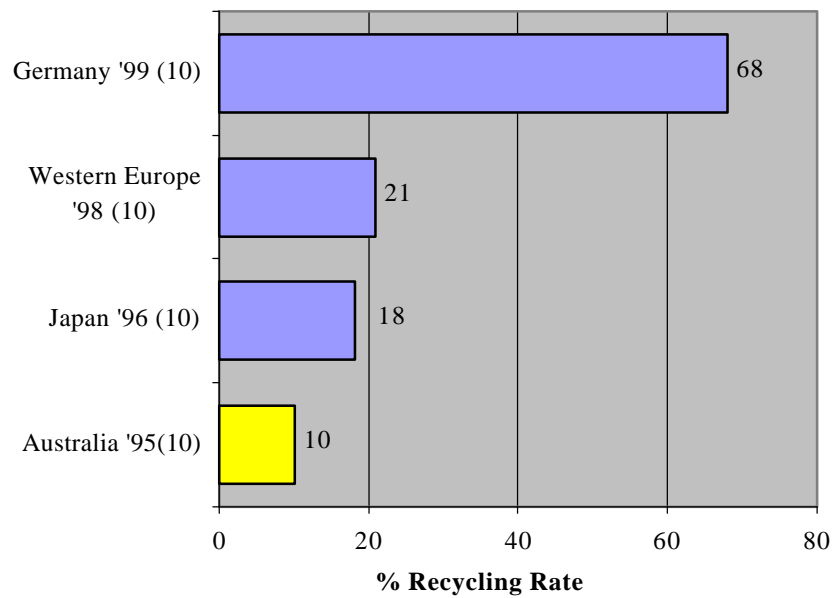


4 LIQUID PAPERBOARD

Data from only a few countries was available for liquid paperboard (LPB).

Western Europe as a whole has an LPB recycling rate of 21%; double that of Australia. Japan is at 18% and Germany has an extraordinary rate of 68%, due in part to the recovery of the valuable aluminium layer from aseptic boxes.

Figure 4.1 - Liquid Paper Board Recycling



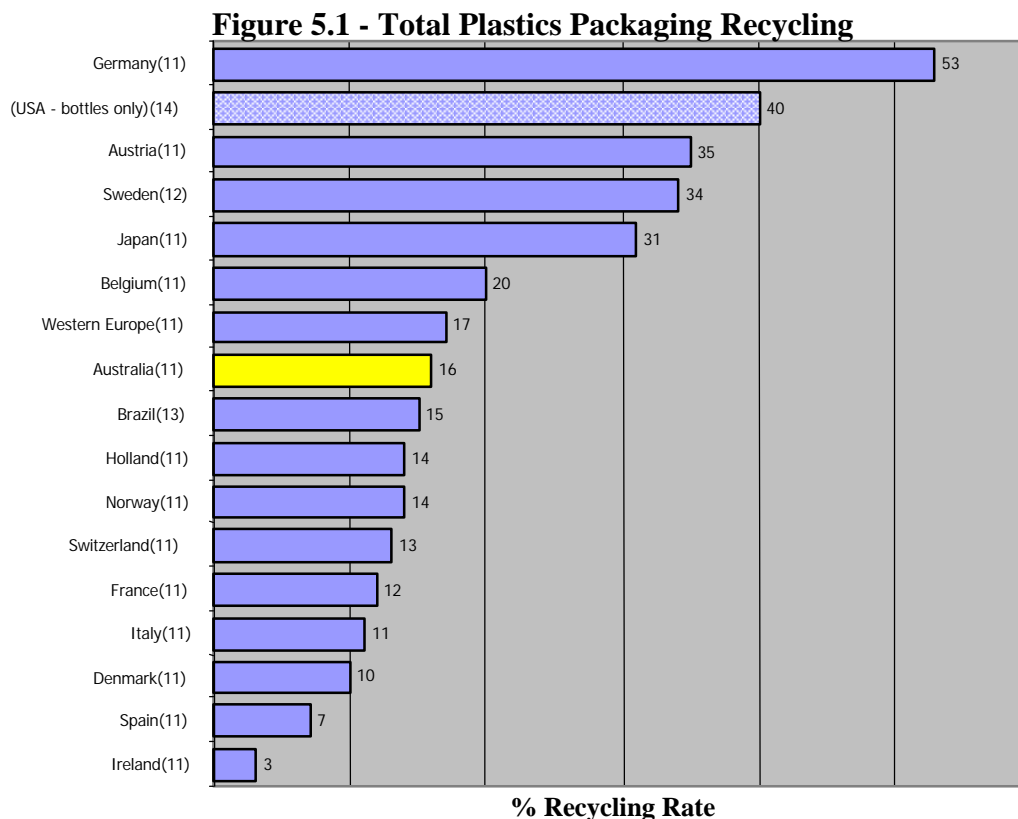
5 PLASTICS

5.1 Plastics Packaging

Following a study undertaken by Nolan-ITU in 2001 for PACIA, it is estimated that the recycling rate for post consumer plastic packaging is approximately 16%. This is not precise, as all the sources of exported plastic material is not known. It is, however, estimated that 80% of the 43 000 tonnes exported in 2000 came from post consumer collections as packaging.

This recycling rate is comparable to many countries researched, where the recycling rates range between 10-20%. All data presented in Figures 5.1 and 5.2 is for the year 2000.

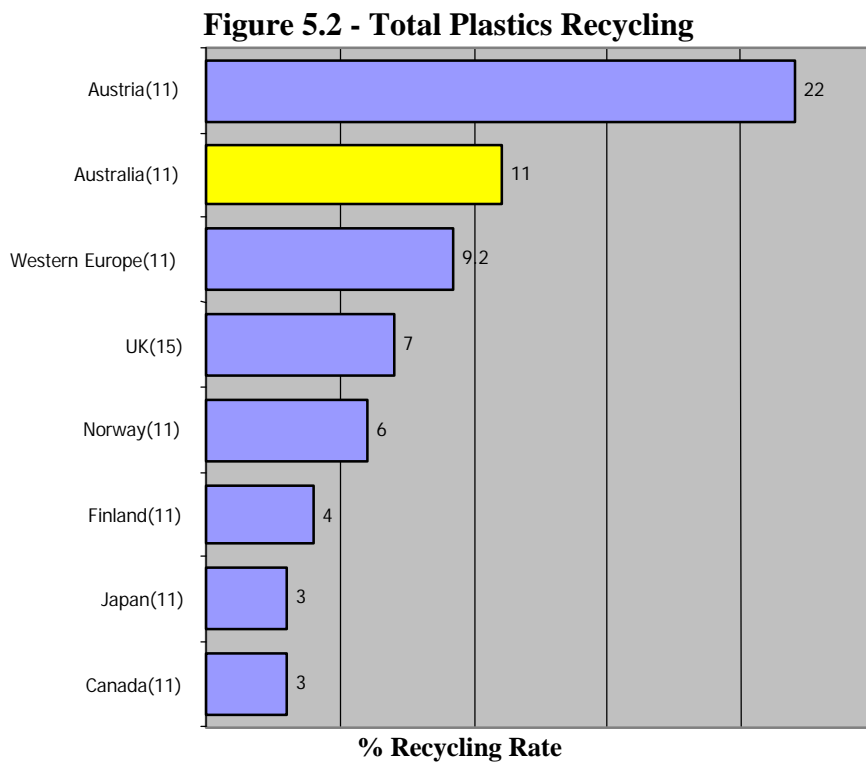
It is possible that the very high recycling levels reported for the USA and Germany may include some counting of waste to energy tonnes.



The Australian recycling activity is primarily limited to rigid packaging. Data on specific plastics packaging polymer types is not readily available. PET bottle recycling rates are known at this stage to be 24% for the USA and 74% for Sweden. HDPE bottle recycling in the USA is 25%.

5.2 Total Plastics

Packaging is only a small proportion of total plastic use and just one aspect of plastics recycling. The study undertaken by Nolan-ITU for PACIA showed an overall plastics recycling rate in Australia of 11% in 2000. This recycling rate reflects recovery in proportion to the total consumption in 2000. A large proportion of plastic goes into long-term market applications (i.e. building, automotive etc), and clearly a proportion of plastics are not available for recovery for many years and in some cases (i.e. sewer pipe) unlikely to ever become available for recycling. As a proportion of the plastics entering the waste stream, the amount recovered represents 18%.

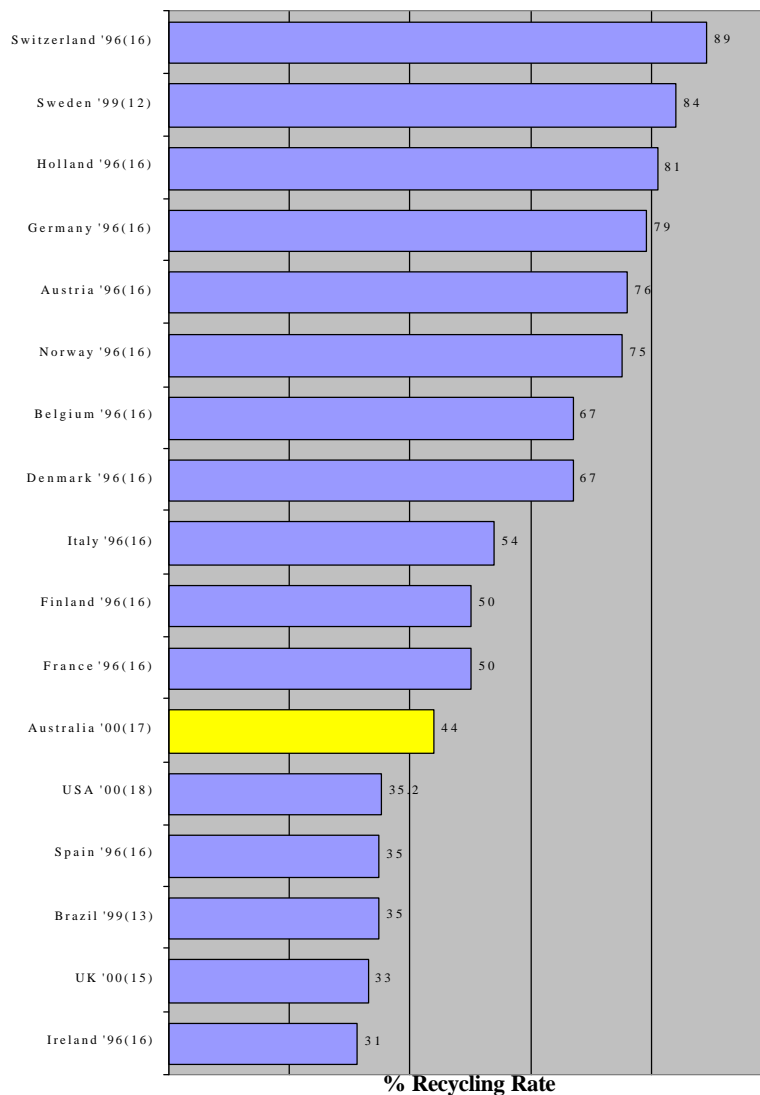


6 GLASS CONTAINERS

The recovery and recycling of glass packaging varies markedly across Europe and North America. The lowest recycling rate is in the UK (33%) and Ireland (31%), and the highest is Switzerland (89%).

The Australian glass packaging recycling rate remained static over many years and there is a concern it may now have dropped below 40%. (The 44% recycling rate figure has been the only publicly available figure since 1996.) This is at a level that is significantly below the average from other countries surveyed. Some caution may be necessary in comparisons of data as some of the rates reported may be as proportions of glass beverage container sales and recycling rather than all glass containers.

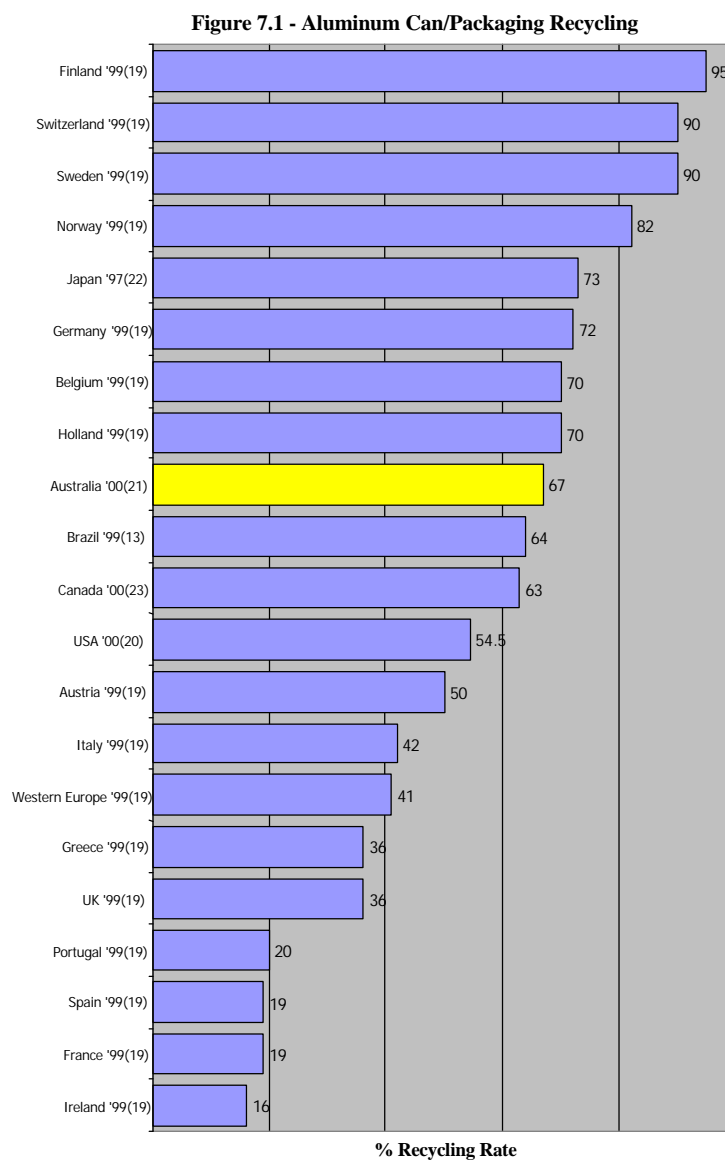
Figure 6.1 - Glass Packaging Recycling



7 ALUMINIUM CANS

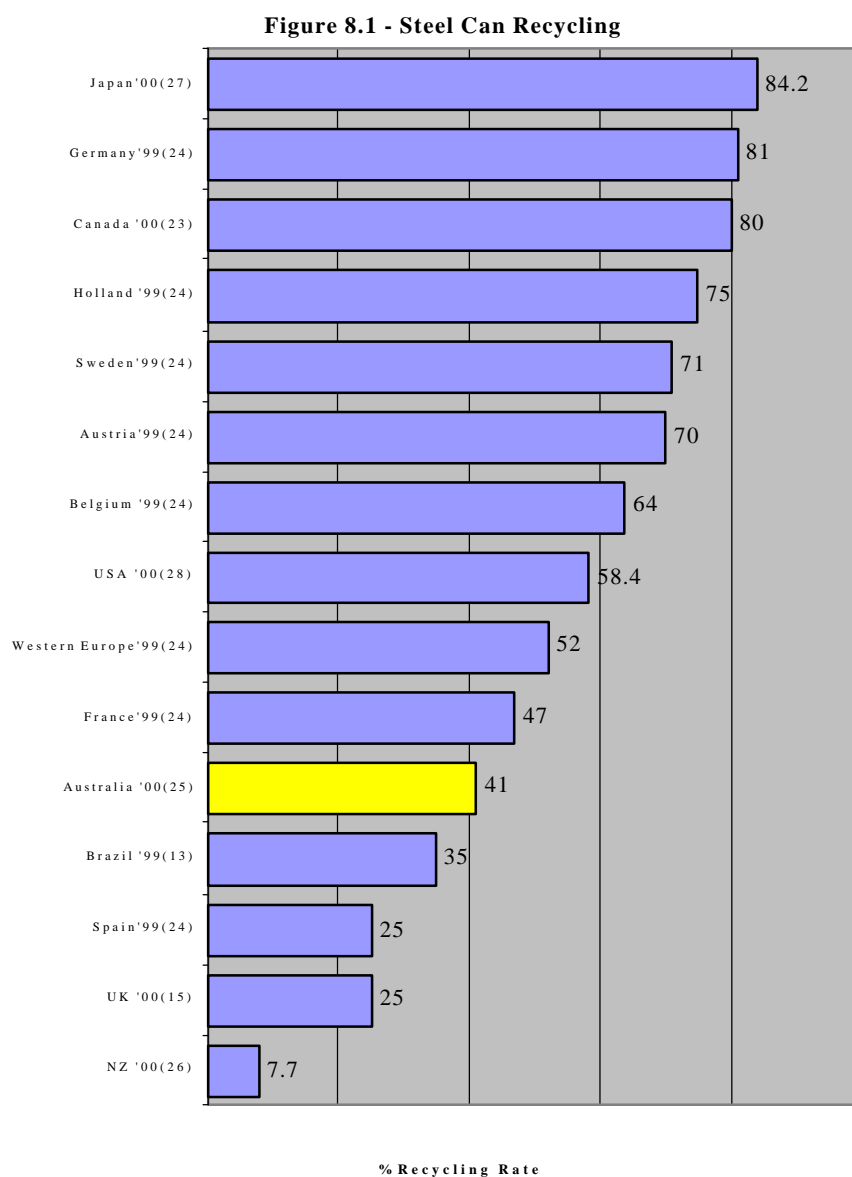
One of the most established and well-recognised recyclables in Australia is aluminium cans.

As with glass packaging, there is enormous diversity in the recycling rates for aluminium cans (also known as used beverage cans or UBCs) around the world. Several countries including Ireland, France and Spain are comparatively poor performing in aluminium recycling, and other countries such as Finland, Norway, Sweden and Switzerland experience extraordinary recycling rates. Australia, at 67%, falls mid-point within a range of other countries which show a 50-70% recovery. Some of the figures may be rates which include non-beverage aluminium packaging, such as aerosols, foil packs and aluminium scrap.



8 STEEL CANS

Steel can recycling is relatively new in Australia, having commenced less than ten years ago. Since then the growth in availability and return of the material has been strong, growing to 41% in 2000. However, by international comparison, the Australian rate is at the lower end of the spectrum, with the USA, Canada, Japan and many European countries exceeding this level. In some of these countries, steel is also used as a beverage container material, resulting in a possible contribution to higher recovery.



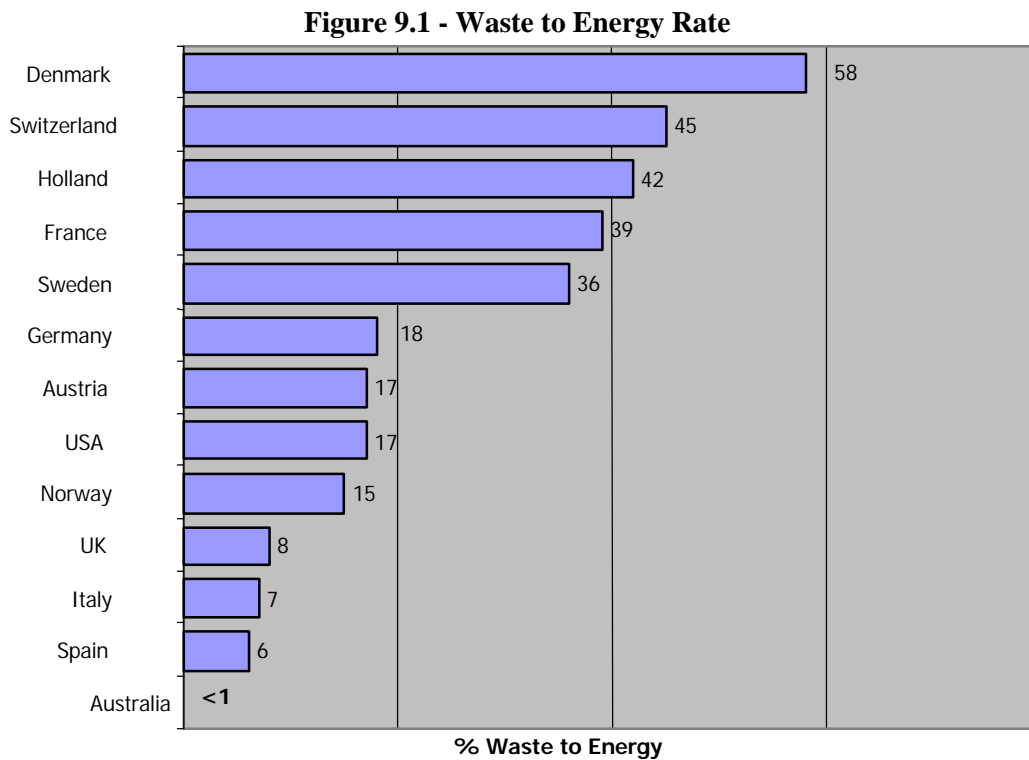
9 OTHER WASTE MANAGEMENT

9.1 Waste to Energy

Many countries around the world now utilise alternative technologies to reduce waste going to landfill and recover embodied energy.

These technologies are relatively new in Australia, and currently less than 1% of waste is processed in waste to energy facilities.

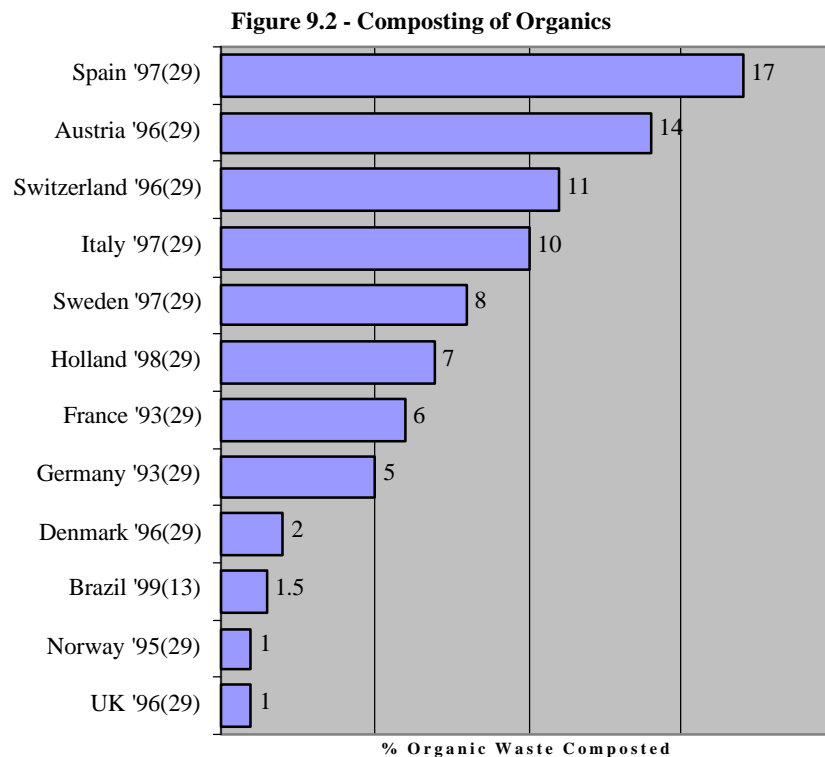
It is interesting to note that countries such as Denmark, Switzerland and Holland, which utilise a relatively high percentage of the municipal and other waste streams for energy generation, are countries which still maintain high levels of diversion for recycling of other materials such as paper and plastics.



9.2 Organics Composting

The proportion of organics from municipal solid waste that is composted in Australia is not currently known, but would likely be low.

Data collected from Europe shows a high level of composting in countries such as Spain and Italy – even though these countries have very low recycling rates for other materials.



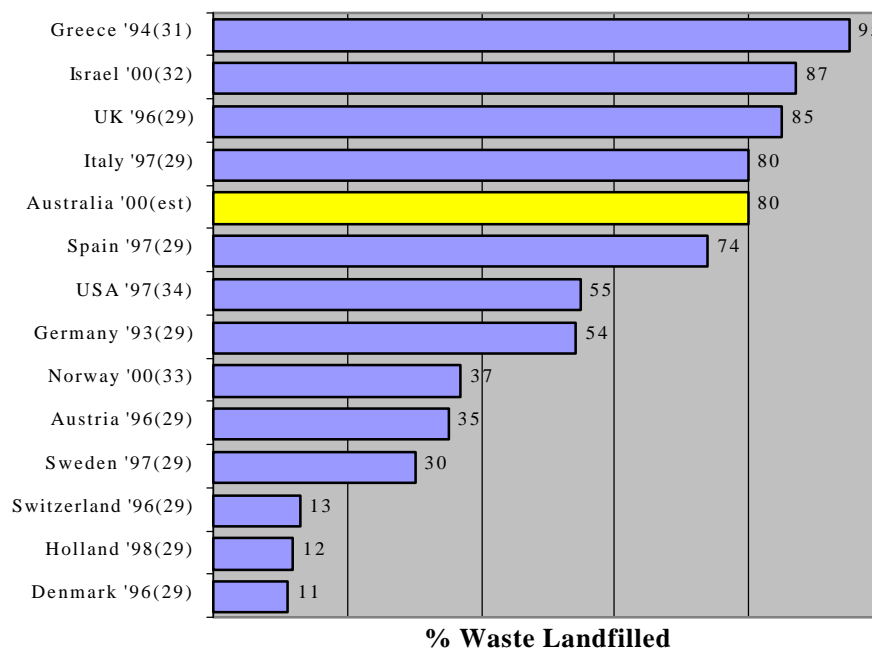
9.3 Waste to Landfill

The proportion of municipal solid waste that is landfilled varies dramatically across Europe. This is influenced by many factors, including landfill availability and cost, and the systems in place for recycling and diversion for energy recovery.

The proportion of waste landfilled in Australia is not known accurately but is estimated at 70-80% with most of the remainder recycled and only a small amount of residual waste going to energy recovery or composting.

Countries such as Denmark, the Netherlands and Switzerland have low landfill rates due to both high recycling and high energy recovery levels. All are small, highly populated countries with limited landfill opportunities.

Figure 9.3 - Landfill Rates



10 OVERALL DOMESTIC RECYCLING

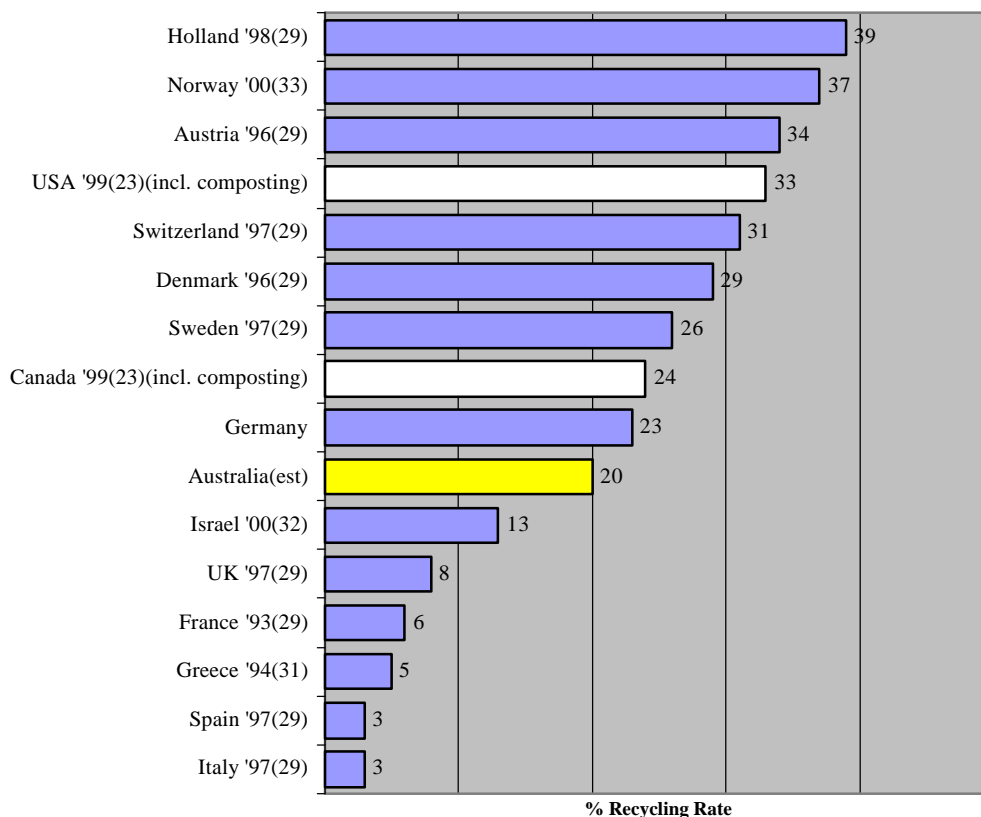
The overall domestic recycling rate refers to the proportion of material diverted for recycling from the total potential waste stream.

Definitive data on national recycling rates are not known for Australia, and research is required in this area. For this study, however, known data from Victoria (25-30%) was extrapolated and adjusted for states with known waste diversion rates based on waste generation and recycling yields. An estimate of 20% has been used.

In Europe there is a belief that 30% is a ‘ceiling’ for domestic recycling as a proportion of domestic waste. In this context, Australia is ‘middle-field’ in overall domestic recycling rates, with European countries such as Holland and Austria having relatively high diversion rates over 34%. The USA has also reported a high domestic recycling rate of 33% but this includes composting.

Australia compares well to other European countries such as the UK, France, Spain and Italy, which all have domestic recycling rates lower than 10%.

Figure 10.1 - Overall Domestic Recycling Rate



11 CONCLUSIONS

In relation to the range of domestic recyclables investigated in this study, Australia is neither a poor performer nor a star performer in the international context. As a general finding, Australia has recycling rates above the lower performing countries in the developed world such as Italy, Spain and UK, and are generally at a level similar to mid-performing countries such as the USA, Canada and France. When benchmarked against high recycling countries such as Sweden, Austria, Germany, the Netherlands and Japan, Australia has a lesser performance across almost all categories.

The kerbside collection of recyclables is now extensive in Australia, but in many areas operates at a less than optimal rate and service. In addition, the recovery of packaging from 'away from home' locations is currently low. With the upgrading of these areas in the next few years it is possible that rates will be comparable with higher recoveries from other countries.

The use of regulated recycling measures and packaging directives by the EU (and the economic drivers that result from them) also influence superior recycling rates in these countries.

One finding worth noting is that recycling rates are not always on the increase. Examples of this are aluminium cans and PET bottles in the USA, which have both dropped significantly in recent years. This demonstrates that considerable effort is required in Australia in order to maintain recycling levels through community education, the expansion and upgrading of services and the minimisation of sorting losses.



Appendix A

Data References

I.D.	Data Source	Data Year
1	Confederation of European Paper Industries (2001)	2000
2	Japan Paper Association (2001)	2000
3	American Forest & Paper Association (2001)	2000
4	Pulp & Paper Manufacturers Federation Aus. (2000)	1999-2000
5	Warmer Bulletin (no.68 - Sept 1999)	1999
6	Pacific Access (2001)	2000
7	Enviros RIS (2001)	2000
8	UK Directory Recycling Program (2001)	2000
9	TBU Consultants (2001)	2000
10	Residua (2000)	1999
11	CIPAD International Status Report (2000)	1999
12	Swedish EPA (2000)	1999
13	Warmer Bulletin (no.68 - Sept 1999)	1999
14	US EPA (2001)	2000
15	UK Dept. of Environment, Food & Rural Aff.(2001)	2000
16	European Glass Federation (1997)	1996
17	ACI (2001)	2000
18	US Glass Packaging Institute (2001)	2000
19	European Aluminium Association (2000)	1999
20	US Container Recycling Institute (2001)	2000
21	Alcoa Australia (2001)	2000
22	Warmer Bulletin (no.67 - July 1999)	1997
23	Enviros (2001)	2000
24	International League Table -Steel Can Recycling (2000)	1999
25	BHP Aust. (2001)	2000
26	Planet Ark (2001)	2000
27	Japan Steel Recycling Institute (2001)	2000
28	US Steel Recycling Institute (2001)	2000
29	Enviros Aspinwall -European Recycling Performance (2000) (various)	
30	Warmer Bulletin (no.69 - Nov. 1999)	1997
31	Greece Ministry for the Environment (1995)	1994
32	Israeli Environment Ministry (2001)	2000
33	Statistics Norway (2001)	2000
34	Warmer Bulletin (no.69 - Nov. 1999)	1997