Estimated recovery and recycling rates for used batteries in Australia

In 2010 ABRI commissioned Warnken ISE to develop a mass balance for batteries in Australia. This included inputs (consumption), stocks (still in service within the economy) and arisings (batteries that had reached the end of their service life or are unwanted for any other reason). Download the executive summary.

The fate of battery arisings was calculated according to the following end of life outcomes:

- reprocessed in Australia
- legal export for reprocessing overseas
- stockpiled formal, in warehouses and industrial facilities according to relevant legislation for battery storage
- stockpiled informal, for example left embedded in products such as mobile phones or left to accumulate in a house, garage, office, barn or mine site
- rebirthing, which is the inappropriate branding of an end of life battery for resale
- illegal export, which although likely to be for reprocessing, carries all of the risks of potentially hazardous materials being processed at unlicensed facilities
- landfill.

Estimated end of life outcomes are presented in the following table for handheld batteries (<1kg), automotive lead acid batteries, and large and industrial batteries.

Table 1: Estimated fate of end of life batteries, tonnes

	Handheld batteries	Automotive lead acid batteries	Large & industrial batteries	All batteries
Reprocessed in Australia	350	66 050	34 350	100 750
Legal export	150	0	150	300
Stockpiled formal	250	3 960	2 290	6 500
Sub-total: Responsible recycling	**750**	**70 010**	**36 790**	**107 550**
Rebirth	10	1 320	725	2 055
Illegal export	50	5 280	2 820	8 150
Sub-total: Recovery	**810**	**76 610**	**40 335**	**117 755**
Landfill	8 024	2 000	1 350	11 374
Sub-total: Waste disposed by consumers	**8 834**	**78 610**	**41 685**	**129 129**
Stockpiled informal	3 070	1 650	1 100	5 820
TOTAL MASS BALANCE	**11 904**	**80 260**	**42 785**	**134 949**

This data has been used to estimate recovery and recycling rates for used batteries using two different methods:

Method 1: Responsible recycling of batteries

ABRI supports the responsible recovery of used batteries for recycling. The estimated recycling rate includes batteries reprocessed in Australia, stockpiled for recycling or legally exported for recycling. The quantity of batteries collected for responsible recycling is divided by the estimated quantity of batteries that had reached the end of their active service life. This includes batteries that are stockpiled informally in homes, businesses or farms.

Table 2: Responsible recycling rate for all end of life batteries, by weight*

Handheld batteries	6.3%
Automotive lead acid batteries	87.2%
Large & industrial batteries	86.0%
Total	79.7%

** Reprocessed in Australia + legal export + stockpiled formal*

Reprocessed in Australia + legal export + stockpiled formal + rebirth + illegal export + landfill +stockpiled informal

Method 2: Recovery of batteries (diversion from landfill)

Most published recycling rates are estimated differently. They do not consider batteries that have reached the end of their useful service life but have not yet been properly disposed of or recovered. They may not distinguish between legal and illegal recycling. Their primary objective is to quantify the percentage of a material or product that has been diverted from landfill. For comparative purposes the mass balance data has been used to calculate a recovery rate for the different batteries, using this approach.

Table 3: Diversion of waste batteries from landfill for rebirth or recycling, by weight**

Handheld batteries	9.2%
Automotive lead acid batteries	97.5%
Large & industrial batteries	96.8%
Total	91.2%

*** Reprocessed in Australia + legal export + stockpiled formal + rebirth + illegal export*

Reprocessed in Australia + legal export + stockpiled formal + rebirth + illegal export + landfill