



## Steel and Aluminium

Producing aluminium and steel products is energy intensive, using finite natural resources and resulting in emission of greenhouse gases. Sending steel and aluminium to landfill is a wasted opportunity because less energy is required to rework recycled steel and aluminium than to produce original material.

### The Problem

#### Scope of the Problem

Aluminium and steel are extremely versatile materials and feature in a wide range of products from drink cans to vehicles and buildings. It is estimated that Australians consume 450,000 tonnes of aluminium for building and construction, packaging and transport every year<sup>1</sup>.

Not only is Australia a large consumer of aluminium, we are also the 5th largest producer of primary aluminium in the world<sup>1</sup>. As a major producer of aluminium, we are responsible for the environmental impacts of production. In addition to aluminium making its way into the waste stream, a great deal of energy is used to manufacture raw steel and aluminium. Production involves the use of water, energy and virgin resources. Extraction leads to greenhouse gas emissions and poor soil health. When the aluminium product is no longer needed, it enters the waste stream unless recycled or reused.

#### Drink can waste

The average Australian consumes 6 kilograms worth of steel drink cans annually. That's 1.7 billion steel cans in total, and only 56% of these cans are recycled and many become litter<sup>2</sup>.

In 2009, an average of 49 cans were collected on each site on Clean Up Australia Day. Every year since 2000, an increasing proportion of litter collected on Clean Up Australia Day has been composed of aluminium or other metals<sup>3</sup>.

Making steel from recycled cans uses 75% less energy than when producing steel from raw materials<sup>2</sup>.

#### Steel Waste

Steel is an inherently 100% recyclable material and in terms of tonnage is the most recycled material in the world.

21% of all steel consumed in Australia is used in engineering construction. Recycling rates are relatively high with some 80-90% of steel being reused or recycled<sup>4</sup>.

#### Global Warming

How does production of steel and aluminium contribute to climate change?

Alumina is found in bauxite and used in the production of aluminium. Production of alumina from bauxite requires direct consumption of energy for heat and steam, as well as indirect consumption of energy as electricity<sup>5</sup>.

Steel is an alloy of iron and carbon and much energy is required to produce heat during the production process. Most electricity is generated by burning fossil fuels, which releases greenhouse gases into the atmosphere, contributing to global warming.

Transport of steel and aluminium materials is also energy intensive: fossil fuels are required for energy to transport materials at every stage of the product life cycle. This includes from mine-site to manufacturing facility to retail outlet to waste management facility.

#### Did you know?

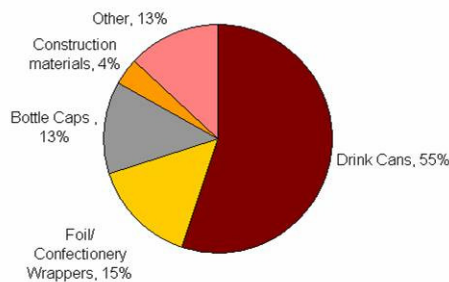
- Aluminium recycling saves energy: current global energy savings are equivalent to Australia's total annual electricity consumption<sup>5</sup>
- Only 35% of aerosols are recycled in Australia even though 94% of Australians have access to aluminium recycling systems via their local councils<sup>2</sup>
- 63% of all branded cans use the 'recyclable steel' logo<sup>2</sup>
- Australia recycles 56% of steel cans, far less than Belgium who leads the world at 94%<sup>9</sup>
- If a magnet is attracted to the product, the product is recyclable!



## Benefits of Recycling Steel and Aluminium

### The Solution

**Table: Typical Breakdown of Metal and Aluminium Items in the Litter Stream<sup>3</sup>**



#### Benefits of Recycling

##### Aluminium

Aluminium is particularly well suited to recycling. Production of aluminium products from recycled scrap material requires 90 – 95% less energy than the production of primary aluminium.<sup>6</sup>

##### Steel

Every tonne of recycled steel saves 1131kg of iron ore,<sup>2</sup> 633kg of coal and 54 kg of limestone .

#### The Recycling Process

##### Aluminium Recycling

If aluminium is not contaminated, it is melted and reprocessed. If it is contaminated with other metals such as steel and iron, the aluminium is separated and then melted into alloys and used predominantly for aluminium castings<sup>7</sup>.

##### Steel Recycling

Magnets are often used to separate steel from other materials. Steel is then melted and reshaped before being used in the production of items as diverse as bikes, paper clips or new drink cans<sup>8</sup>.

#### How to find Recyclers in your Local Area

Go to PlanetArk's *Recycling Near You* website: [www.recyclingnearyou.com.au](http://www.recyclingnearyou.com.au)

#### Why buy Recycled Steel and Aluminium?

##### Sustainability Benefits of Recycling Aluminium and Steel

Conserve valuable natural resources and raw materials

Avoid air and water pollution: using recycled materials generally creates less pollution

Save landfill space by closing the loop: steel can be recycled indefinitely keeping it out of the waste stream. Recycling also ensures materials don't become litter!

Reducing the need to dig for virgin materials conserves soil integrity and wildlife habitats

Save energy: recycled products require less energy to manufacture thus conserving oil and reducing greenhouse gas emissions

#### References

1 Australian Aluminium Council  
<http://www.aluminium.org.au/Page.php?s=1005>

2 CanSmart  
[http://www.cansmart.org/Facts/fast\\_facts.html](http://www.cansmart.org/Facts/fast_facts.html)

3 Clean Up Australia Ltd  
Rubbish Report 2009

4 Australian Steel Institute  
(<http://www.steel.org.au/inside.asp?ID=635&pnav=635>).

5 Australian Aluminium Council  
2007 Sustainability Report  
<http://www.aluminium.org.au/Page.php?d=1309>

6 European Aluminium Association  
<http://www.eaa.net/en/about-aluminium/recycling/>

7 Capral  
<http://www.capral.com.au/AluminiumAndYouFaq/default.aspx>

8 Recycle Now  
[http://www.recyclenow.com/why\\_recycling\\_matters/how\\_is\\_it\\_recycled/steel/index.html](http://www.recyclenow.com/why_recycling_matters/how_is_it_recycled/steel/index.html)

9 CanSmart  
[http://www.cansmart.org/Facts/int\\_l\\_eague\\_table.html](http://www.cansmart.org/Facts/int_l_eague_table.html)

#### Steel and Aluminium into the Future

Australians are increasingly demanding that producers conserve finite natural resources and reuse steel and aluminium products.

However, a significant amount of steel and aluminium continues to enter the waste stream and to litter our environment. Because of the unique properties of aluminium and steel, it is important that all Australians work together towards a 100% recycling rate.