

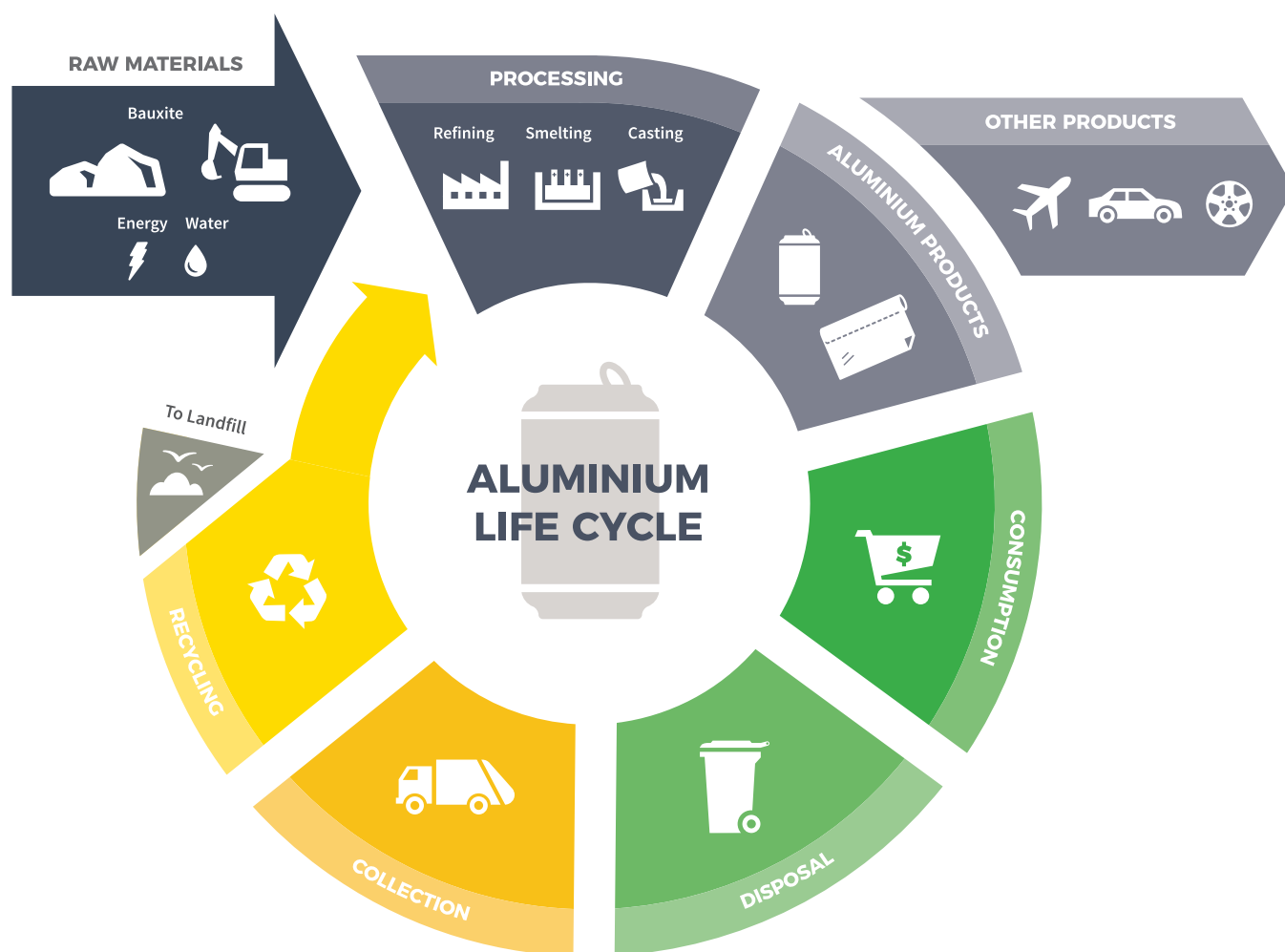
Aluminium recycling



Waste Sorted

INTRODUCTION

Aluminium is an extremely versatile material and features in a wide range of products from drink cans to vehicles and buildings. Production of aluminium is an energy intensive process, using finite natural resources and resulting in greenhouse gas emissions. Recovery and recycling of aluminium requires significantly less energy than production from raw materials and saves valuable resources.



HOW IS IT MADE?

The mineral bauxite is mined in Australia from open-cut mines in Queensland and Western Australia and transported to local refineries where it is converted into alumina (Al_2O_3), a fine white powder. The alumina is then smelted into pure aluminium and cast into large ingots or rolled into long sheets.

Production of aluminium from bauxite requires direct consumption of energy for heat as steam, as well as consumption of energy as electricity.¹ Fossil fuels are also required to transport materials for primary aluminium production.



Aluminium recycling



THE PROBLEM

It is estimated that each year Australians consume 450,000 tonnes of aluminium for building and construction, packaging and transport.

Not only is Australia a large consumer of aluminium, it is also the fifth largest producer of primary aluminium in the world.² As a major producer of aluminium, we are responsible for the environmental impacts of its production, so it is important that we focus on recycling of aluminium to reduce these impacts. Mineral extraction and transport of minerals for processing generates greenhouse gas emissions and damages natural environments.

Australians use over 3 billion aluminium cans annually, and approximately 350,000 aluminium cans made every minute all over the world. Only 56% of these cans are recycled and many become litter.³

The 2016 Clean Up Australia Day report found metal rubbish (including aluminium beverage containers) increased by 10% in the ACT and by 1.8% nationally.⁴

THE SOLUTION

BENEFITS OF RECYCLING ALUMINIUM

Aluminium is particularly well suited to recycling as 100% can be recovered in the recycling process. Re-melting used aluminium saves up to 95% of the energy needed to produce the primary product and reduces the environmental impacts of bauxite mining.⁵ Aluminium cans, packaging and foil can be recycled through kerbside recycling collections. The aluminium is separated from the co-mingled recycling using electromagnets which induce eddy currents, causing the aluminium to be repelled and pushed into a separate collection bin. Aluminium is then baled and sold for re-processing. Reprocessing involves crushing, shredding and melting with new aluminium before converting into new products.

CONTAINER DEPOSIT SCHEME

The ACT container deposit scheme (CDS) will allow consumers to return eligible beverage containers to designated drop-off points and receive a 10 cent refund. This will help reduce litter, increase resource recovery rates and help engage the community in recycling.

EXPERIMENT AT HOME

To learn more about how aluminium is affected by magnets and for experiment ideas visit <https://terpconnect.umd.edu/~wbreslyn/magnets/is-aluminium-magnetic.html>

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DID YOU KNOW?

- Aluminium recycling saves 95% of the energy of primary production.
- Current global energy savings from aluminium recycling are equivalent to Australia's total annual electricity consumption.
- In Australia only 56% of cans are currently returned for recycling, despite 94% of households having access to recycling facilities.
- The average ACT household throws out approximately 3 aluminium cans a week which is about 1% of the recycling bin by weight.

REFERENCES

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3. Townsville City Council. <https://www.townsville.qld.gov.au/water-waste-and-environment/waste-and-recycling/reduce-reuse-recycle>
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