# Australia’s comparative and competitive advantages in transitioning to a circular economy – at a glance

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## Key findings

* Establishing a circular economy is both an economic opportunity and an environmental need. A circular economy has 3 key goals:
* eliminating waste
* maintaining and increasing the value of materials and products through repeated use
* conserving natural resources
* In 2022, the world extracted more than 100 billion tonnes of biomass, fossil fuels, metal ores and non-metallic minerals, 3 times the amount of 50 years ago. One-third of all extracted material is discarded within a year.
* Reversing this loss of natural capital and economic value could unlock US$4.5 trillion of value by 2030, address 50 per cent of climate change impacts, 90 per cent of water stress and land use related biodiversity loss, and 30 per cent of particulate matter health impacts.
* The five industries with the most potential for Australia to build globally competitive products or services in a more circular global economy are mining, construction, manufacturing, agriculture, and resource recovery. This is due to their significant amounts of raw materials or products that can be reused or recycled, as well as the potential for reducing negative environmental impacts.

## Key opportunities for Australia

**Mining**

* Recovery of valuable materials such as critical and minerals from tailings.
* Repurposing of mining byproducts, such as rocks for construction, and tailings for cement, for ceramics and as sand substitute.
* Repurposing closed mines as sites for energy storage systems.

Australia produces 620 million tonnes of mine byproducts a year.

**Construction**

* Use of mining and agricultural byproducts as materials, such as masonry units or wood foams.
* Recycling timber for use in cross-laminated timber.
* Modular housing, enabling easier disassembly at end of life.
* Low-carbon concrete.
* Regional resource recovery centres to reduce transport costs.

**Manufacturing – lithium-ion batteries**

* Designing and manufacturing batteries for disassembly and recovery at the end-of-life phase.
* Recycling of valuable metals.
* Reusing vehicle batteries for energy storage systems.
* Refurbishing commercial batteries for household use.

Global demand for electric vehicles increased 35 per cent in 2022 alone. Australia holds significant global supply‑chain advantage, including as the producer of 9 of the 10 minerals required to manufacture lithium-ion batteries, and its expertise in mining resource extraction and processing.

**Manufacturing – plastics**

* Developing non-toxic biodegradable and compostable plastics.
* Advanced recycling of soft plastics.

Australia produces 2.63 million tonnes of plastic waste a year, 66 per cent of which has potential for recycling. The Global Plastics Treaty 2025 requires plastic to contain a minimum of 30 per cent recycled plastic.

**Manufacturing – clothes and textiles**

* Recovery of viscose and other biodegradable fibres.
* Regenerative apparel.
* Reusing textile dye for art through pulverising waste to a powder.

**Agriculture**

* Use of agri-food wastes and byproducts such as grape marc.
* Biomass as feedstock.
* Insect technology.
* Biomass-based products cycling back through the farm, including using cotton fibre waste to enrich cotton farm soils.

**Waste management**

* Streamline standards and processes across waste management and resource recovery.
* Divert abundant waste by-products for beneficiation.

## Capitalising on the opportunity

**Governance**

A circular economy in Australia will require the harmonisation of waste management frameworks, adoption of international best practices and ways to incentivise waste management services.

**Workforce**

Skills gaps for a circular economy, including engineering and digital skills, could be addressed through:

* Short courses and micro-credentials through the vocational education sector.
* A ‘skills passport’ to recognise and transfer accredited skills across different industries.
* Skilled migration for the necessary professional, scientific and technical skills in industries such as green energy and technology.

**Innovation**

Ways to encourage digital innovation, and innovation in design, development and production, include:

* a governance framework for data ownership, quality, safety and security
* incentives to encourage industry uptake of digital technologies such as AI, big data, robotics and Internet of Things
* linking research and development funding to participation in shared innovation networks.

**Export and import implications**

* ‘Circular’ products could be particularly attractive to markets that set a strong policy for sustainable consumption, such as in the European Union.
* Australia could promote environmental sustainability and foster responsible procurement by prioritising circular economy imports.

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