SWITCH YOUR THINKING:

THE CIRCULAR ECONOMY

KEEPING MATERIALS IN USE AND REDUCING WASTE

GOVERNMENT OF WESTERN AUSTRALIA
WASTE AUTHORITY
WA...TOO GOOD TO WASTE
This project is supported by the Government of Western Australia and the Waste Authority

WasteSorted
A Waste Authority Program

SWITCH YOUR THINKING

RETHINKING WASTE, VALUE AND OPPORTUNITY

RIGHT NOW, MOST OF WHAT WE BUY FOLLOWS THE SAME PATH:

TAKE → MAKE → USE → DISPOSE

- We extract raw materials.
- We turn them into products.
- We use them briefly.
- We throw them away.

This “linear” system has helped drive economic growth — but it has also led to rising waste, growing greenhouse gas emissions, and increasing pressure on natural resources.

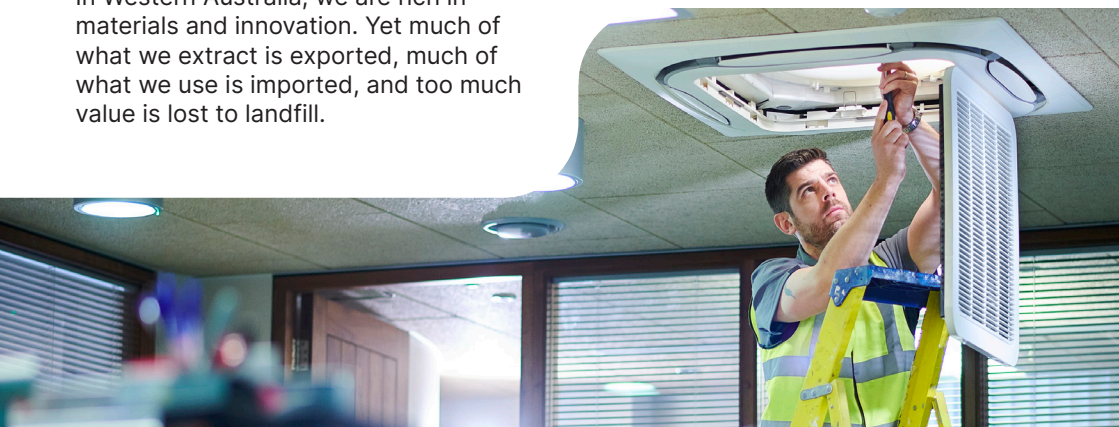
In Western Australia, we are rich in materials and innovation. Yet much of what we extract is exported, much of what we use is imported, and too much value is lost to landfill.

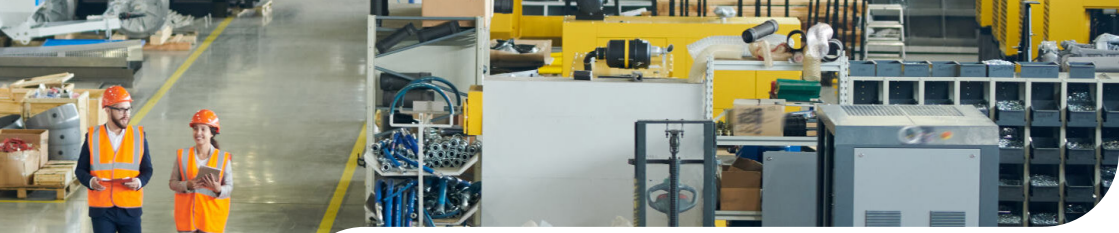
THE CIRCULAR ECONOMY OFFERS A SMARTER ALTERNATIVE.

Instead of creating waste, it keeps materials in use for as long as possible — at their highest value. It supports local jobs in repair, remanufacturing and recycling, reduces reliance on virgin materials, and strengthens communities.

This is not about sacrifice. It’s about smarter design, better systems, and keeping value where it belongs — in our economy and environment.

Circular thinking is already growing across WA. Now is the time to accelerate it.





WHAT'S IN THE GUIDE?

THE MID-20TH CENTURY MARKED A PERIOD OF SIGNIFICANT TRANSFORMATION IN PRODUCTION, CONSUMPTION, TRANSPORT, AND TECHNOLOGY.

Key changes include the rise of mass production, the expansion of consumerism, revolutionary advancements in transportation, and the advent of the information age.

Many of these changes have placed unprecedented demands on the environment and our natural resources.

Current mainstream practices are not sustainable but a Circular Economy will help us shift toward a cleaner environment and long-term economic prosperity. This way of doing things will soon become the new normal.

IN THIS GUIDE, SWITCH YOUR THINKING WILL EXPLAIN:

WHAT THE CIRCULAR ECONOMY IS AND IS NOT

The circular economy is a model of production and consumption that keeps products, materials, and resources in circulation for as long as possible — at their highest value — while minimising waste.

It contrasts with the traditional linear model of "take–make–dispose" and aims to create economic value without wasting resources, delivering benefits for people, businesses, and the planet.

THE CIRCULAR ECONOMY IS NOT...

- **Just recycling:** Although recycling is important, it is only one small part of the picture.
- **A sacrifice or going without:** It's not about owning less or living less comfortably. It's about getting more value from what already exists.
- **Only for businesses or governments:** While systemic change requires action at every level, everyday choices are all part of the circular economy in action.
- **A perfect solution:** The circular economy significantly reduces waste and emissions, but it works best alongside broader changes.

CIRCULAR ECONOMY FUNDAMENTALS

AUSTRALIA IS TRANSITIONING, BUT WE STILL LARGELY OPERATE IN A LINEAR ECONOMY.

Moving to a circular economy means redesigning how we make, use, and value products — it's not just about improving recycling.

WHERE CIRCULAR ECONOMY THINKING COMES FROM

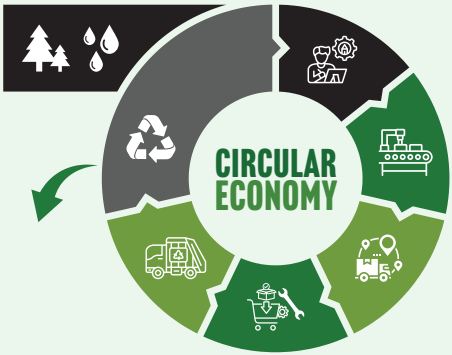
Key influences include:

- **Biomimicry:** Learning from how nature designs systems with no waste (Janine Benyus).
- **Cradle to Cradle:** Designing products so materials can safely cycle again and again (William McDonough & Michael Braungart).
- **Performance Economy:** Shifting from owning products to accessing services, keeping products in use longer (Walter Stahel).
- **Industrial Ecology:** Treating industry like an ecosystem, where one organisation's waste becomes another's resource.

THE 3 CORE PRINCIPLES

The modern circular economy framework has been widely advanced by the **Ellen MacArthur Foundation** – a global organisation developing and promoting the idea of a circular economy.

The foundation outlines three core circular economy principles:



LINEAR ECONOMY

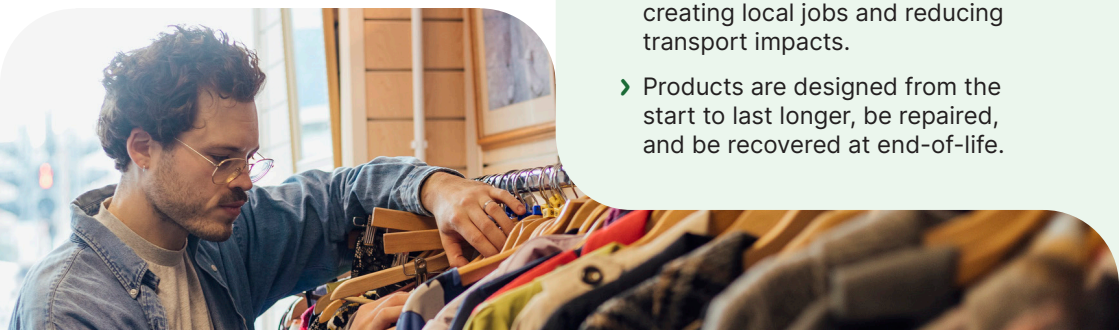
The system most of our economy still follows.

- Resources are extracted, made into products, used, and then thrown away.
- Most products rely heavily on new (virgin) materials and fossil energy.
- Large amounts of materials end up in landfill and are lost from the economy.
- The energy, water and resources used to make products are lost when those items are discarded.
- Materials often travel long distances through global supply chains.
- Products are rarely designed with their full life cycle in mind.

CIRCULAR ECONOMY

A system designed to keep resources in use.

- Materials are kept in circulation for as long as possible through reuse, repair, remanufacturing and recycling.
- Greater use of renewable materials and renewable energy.
- Products and materials are recovered as high up the waste hierarchy as possible — prioritising reuse and repair before recycling.
- The value of materials, energy and water is preserved instead of being lost to landfill.
- Organic materials safely return to nature, for example through composting.
- Wherever possible, materials are reused and processed locally, creating local jobs and reducing transport impacts.
- Products are designed from the start to last longer, be repaired, and be recovered at end-of-life.



WHY GO CIRCULAR?

1 REDUCE RAW MATERIALS

Many materials (metals, water, timber) are finite and being used faster than they can regenerate. Over-extraction leads to habitat destruction, loss of biodiversity, and soil degradation. A circular economy reduces the pressure by keeping materials in use longer.

2 PROTECT OUR ENVIRONMENT

Landfills produce methane (a potent greenhouse gas) and pollute soil and water. Plastic waste harms wildlife and ecosystems. Local recycling and reuse can cut transport emissions and keep materials in the economy.

3 ECONOMIC & SOCIAL IMPACTS

A linear economy loses money when materials are discarded. Jobs can be created in repair, remanufacturing, recycling, and local solutions. Businesses and governments that act early save costs and reduce risks.

Annual emissions of 23.3 tonnes per capita put Australia in the highest global bracket, far above the near-zero levels essential for limiting temperature rise (climatechangetracker.org).

OUR PLANET IS AT RISK

- Human activity has increased global demand for energy, materials, and food.
- CO_2 and other greenhouse gases trap heat, warming the planet. This drives climate change.
- Overconsumption strains natural resources like water, forests, and minerals.

CLIMATE CHANGE BASICS

- Burning fossil fuels releases carbon dioxide, driving global warming.
- Rising temperatures cause more extreme heatwaves, floods and droughts.
- Climate change affects everyone — food supply, health, and livelihoods.

CIRCULAR ECONOMY VS. CLIMATE CHANGE

Around 45% of global greenhouse gas emissions come from producing materials, products, food, and land use. These are areas where circular practices — like reusing, repairing, and designing out waste — can make a real difference (Ellen MacArthur Foundation, 2025).

The remaining 55% of global greenhouse gas emissions come from sectors that circular practices alone can't fully address.

This includes energy production (like electricity and heat from fossil fuels), transport and mobility, industrial processes, and some aspects of agriculture that are not material-oriented, such as livestock methane and fertiliser emissions (IPCC, 2022).

WHAT IS RENEWABLE ENERGY?

Renewable energy comes from sources that are naturally replenished and don't run out on human timescales — like sun (solar), wind, water (hydro), geothermal, and biomass.

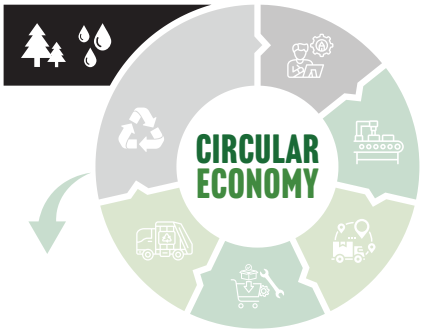
Unlike fossil fuels (coal, oil, gas), use of renewables aims to control net greenhouse gas levels when generating electricity, making them key to cutting climate pollution and limiting global warming.

OUTLOOK FOR WESTERN AUSTRALIA

In WA, renewables are growing fast. In late 2025, more than 55% of electricity on WA's main grid (the South West Interconnected System) came from renewable sources, a new record as wind, solar and storage increase (WA Government 2025).

SOLAR

Australia is home to the highest rooftop solar take-up in the world by household penetration, and continuous growth in large-scale solar and wind projects is playing a big role in reducing fossil fuel use.



MATERIALS IN A CIRCULAR ECONOMY

Materials are the foundation of a circular economy. Every product begins with **raw resources** — from metals and minerals to fibres, plastics and timber. In a circular system, materials are **chosen carefully**, **used efficiently**, and kept at their **highest value for as long as possible**.

This means designing for durability, repair, reuse, and recovery from the very beginning. The goal is not just to manage waste at the end, but to rethink what materials we use, where they come from, and what happens to them next.

WHAT IS PRODUCT STEWARDSHIP?

Product stewardship means producers, importers and retailers share responsibility for what happens to a product at the end of its life.

Instead of councils and communities carrying the full cost, industry helps fund collection and recycling systems.

Examples of Product Stewardship Schemes in WA include **Containers for Change** and the **National Television and Computer Recycling Scheme** (NTCRS).

MATERIALS IN A WESTERN AUSTRALIAN CONTEXT

Western Australia is one of the most resource-rich regions in the world. We mine iron ore, lithium, bauxite, nickel and rare earth elements — the building blocks of steel, aluminium, batteries and renewable energy technologies.

Much of what we extract is exported as raw material, with processing and manufacturing happening elsewhere. However, WA does refine alumina and lithium, produce nickel, manufacture building materials, process timber and support growing local recycling industries.

As a resource-rich state, we have both an opportunity and a responsibility. A circular economy means **using these materials efficiently**, designing products to last, and **recovering more value locally** — rather than simply extracting and exporting.

EXAMPLES FOR BUSINESSES & INDUSTRY

- Select materials that are durable, repairable and recyclable.
- Reduce reliance on virgin materials by increasing recycled content.
- Source renewable or responsibly managed materials.
- Design products using fewer material types to improve recovery.
- Eliminate problematic or hard-to-recycle materials from product design.
- Track material flows to understand resource use and reduce waste.
- Invest in local remanufacturing or recycled material supply chains.
- Reclaim and reuse your own materials to strengthen circular supply systems.

EXAMPLES FOR INDIVIDUALS

- Choose products made from recycled or renewable materials.
- Buy durable, repairable items instead of disposable alternatives.
- Avoid products with excessive or mixed-material packaging.
- Support brands that are transparent about their material sourcing.
- Repair clothing, furniture or appliances to extend material life.
- Buy second-hand to keep materials in circulation longer.
- Ask businesses what materials their products are made from.

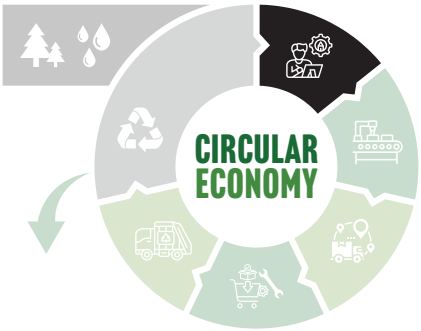
EXAMPLE: THE T-SHIRT

LINEAR ECONOMY

- Virgin cotton grown using high water and chemical inputs
- Manufactured offshore
- Worn a handful of times
- Discarded to landfill
- Materials lost permanently

CIRCULAR ECONOMY

- ✔ Lower-impact or recycled fibre
- ✔ Designed for durability and easy repair
- ✔ Timeless style instead of fast trends
- ✔ Repairable stitching and replaceable components
- ✔ Resold, donated, or recycled into new fibre
- ✔ Materials kept in circulation



SYSTEM AND PRODUCT DESIGN

1 DESIGN OUT WASTE AND POLLUTION

Instead of creating products that end up in landfill or pollute the environment, circular design considers waste from the very beginning. Materials are chosen and processes planned so that pollution is prevented, not treated after the fact (think smarter packaging, non-toxic materials, and products that last).

2 KEEP PRODUCTS AND MATERIALS IN USE

Business as usual treats products as disposable. Circular design keeps items, parts, and materials circulating through repair, reuse, sharing, or recycling. The goal is to get the most value from every resource before it reaches the end of life.

3 REGENERATE NATURAL SYSTEMS

Rather than depleting resources, circular design aims to restore and replenish nature. This can include using renewable materials, restoring soil, supporting biodiversity, or returning clean water to ecosystems. Business as usual often ignores the environmental cost of extraction and production.

PLANNED OBSOLESCENCE

Planned obsolescence is when products are deliberately designed to have a short lifespan or become outdated quickly. This means people have to replace them sooner. This drives more waste, higher resource use, and more emissions compared with products designed to last, be repaired, or be upgraded.

EXAMPLES OF CIRCULAR DESIGNS

1 DESIGN FOR PRODUCT ATTACHMENT AND TRUST

Creating products that people feel affection or trust toward helps reduce the risk of them becoming outdated or unwanted. As a result, people are more likely to keep products for longer.

2 DESIGN FOR DISASSEMBLY AND REASSEMBLY

Products are engineered so their components can be easily taken apart and put back together, making remanufacturing more feasible.

3 DESIGN FOR PRODUCT DURABILITY

Products are built to endure regular use, resist damage, and maintain their functionality over an extended lifespan.

4 DESIGN FOR STANDARDISATION AND COMPATIBILITY

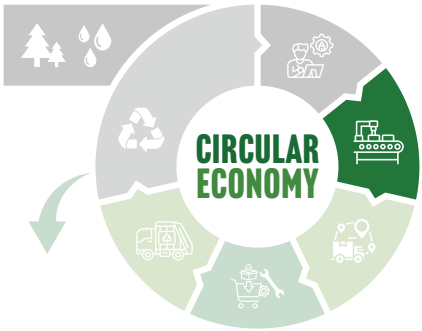
Products are designed so that their components can be shared across multiple models or different brands. This makes it easier to repair items and ensures replacement parts remain available for a longer period.

5 DESIGN FOR UPGRADABILITY AND ADAPTABILITY

Products are designed to support future upgrades, modifications, and enhancements, helping prevent systemic obsolescence. This ensures the product can evolve as users' needs change over time.

6 DESIGN FOR EASE OF MAINTENANCE AND REPAIR

Products are created so that repairs and routine upkeep are straightforward. When something goes wrong, both manufacturers and users can easily fix and maintain the product.



CIRCULAR PRODUCTION

More than 80% of a product's environmental impact is determined during its design phase.

Circular production means making things differently — **designing products to last longer**, **be repaired**, and **be remade** rather than thrown away.

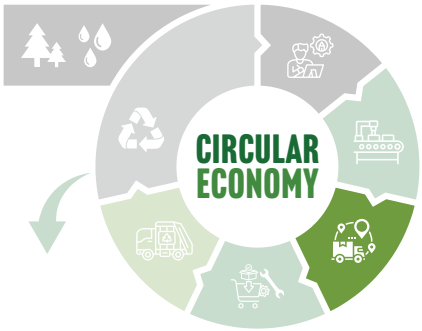
It's a shift away from the traditional "take-make-waste" approach towards one where nothing goes to waste.

EXAMPLES FOR BUSINESSES & INDUSTRY

- Design products from the start to be disassembled and remade.
- Use recycled or reclaimed raw materials instead of virgin materials.
- On-sell factory waste or off-cuts as raw material to another manufacturer.
- Lease products instead of selling them so materials are recovered at end of life.
- Take back old products from customers to recover and reuse materials.
- Use renewable energy in manufacturing processes.
- Design out toxic or hard-to-recycle materials from products entirely.

EXAMPLES FOR INDIVIDUALS

- Avoid products with built-in obsolescence.
- Choose products that will last longer and save money in the long run.
- Choose products with minimal, recyclable or reusable packaging.
- Choose products made from recycled or sustainably sourced materials.
- Choose locally made products where possible — supporting local businesses and reducing transport emissions.
- Buy from brands with take-back or repair programs.



CIRCULAR DISTRIBUTION

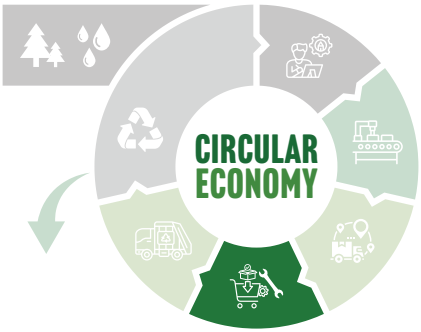
Circular distribution is about getting products from makers to users in the smartest, cleanest way possible. This means minimising packaging, reducing transport emissions, and designing delivery systems that can be reversed so materials can flow back into the cycle.

EXAMPLES FOR BUSINESSES & INDUSTRY

- Use reusable, returnable or minimal packaging instead of single-use materials.
- Optimise delivery routes to reduce fuel consumption and emissions.
- Use electric or low-emission vehicles for ‘last-mile’ delivery.
- Partner with local suppliers to shorten supply chains and cut transport impacts.
- Offer take-back logistics so customers can return products or packaging for reuse.
- Consolidate shipments to reduce the number of trips made.
- Design packaging that protects products without excess material.

EXAMPLES FOR INDIVIDUALS

- Choose to buy local products to reduce the distance goods travel.
- Consolidate online orders into one delivery rather than multiple separate shipments.
- Choose products with minimal or reusable delivery packaging.
- Opt for click-and-collect instead of home delivery where possible to reduce last-mile emissions.
- Return packaging to retailers or brands that offer take-back programs.



CONSUMPTION AND USE

Circular consumption and use is about how we **choose**, **care** for and **interact** with products once they're in our hands. It encourages buying only what we truly need, choosing durable and repairable items, **sharing** where possible, and using products to their full potential.

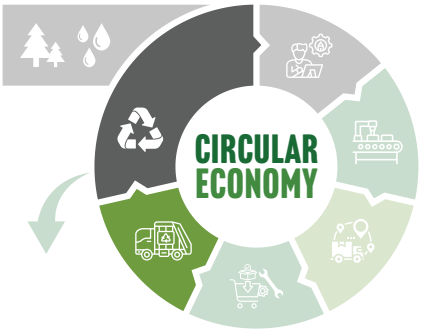
The goal is simple: keep materials in active use for as long as possible, reduce unnecessary waste, and slow the flow of new resources entering the system.

EXAMPLES FOR BUSINESSES & INDUSTRY

- Create leasing, subscription or product-as-a-service models instead of one-off sales.
- Provide clear care instructions to help customers use products for longer.
- Encourage sharing models (e.g. hire, refill, or membership systems).
- Design products that can be upgraded rather than replaced.
- Offer take-back programmes for refurbishment or remanufacturing.
- Reduce planned obsolescence through modular design.

EXAMPLES FOR INDIVIDUALS

- Buy only what you genuinely need.
- Choose durable, high-quality products over cheap, short-lived ones.
- Maintain and repair items instead of replacing them.
- Share, borrow or hire items you rarely use.
- Choose refillable or reusable products.
- Upgrade or replace parts rather than the whole product.
- Care for and maintain items properly to extend their lifespan.



COLLECTION AND RECYCLING

Collection and recycling focus on what happens when a product can no longer be reused or repaired.

In a circular economy, materials are carefully collected, sorted and processed so they can become valuable resources again, rather than ending up in landfill.

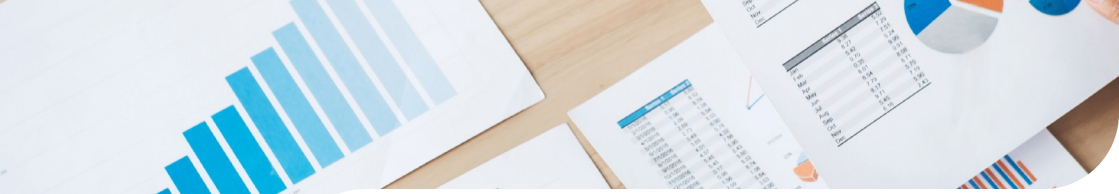
While recycling is not the first priority, it plays an essential role in keeping materials in circulation and reducing the need to extract new raw resources.

EXAMPLES FOR BUSINESSES & INDUSTRY

- Design products and packaging for easy disassembly and recycling.
- Use recycled content in new products to strengthen local recycling markets.
- Close the loop on your own materials.
- Establish in-store or office take-back systems for batteries, electronics or packaging.
- Participate in Containers for Change by setting up collection bins at offices, events or retail locations.

EXAMPLES FOR INDIVIDUALS

- Return eligible drink containers through Containers for Change.
- Encourage children to collect containers or donate refunds to a local charity or school.
- Donate working items instead of recycling them.
- Choose products made with recycled materials to support the recovery system.
- Drop off broken electronic waste at approved collection sites.
- Use supermarket or community battery recycling points.



HOW TO MEASURE CIRCULARITY

YOU CAN'T IMPROVE WHAT YOU DON'T MEASURE.

Circularity means understanding how materials flow through a product, service or organisation — and where value is lost.

LIFECYCLE ASSESSMENT (LCA)

Lifecycle Assessment is a systematic process that evaluates the environmental impacts of a product or process across its entire life cycle — from raw material extraction to disposal.

Goal & Scope
What are we assessing, and why?

→

Inventory Analysis
What goes in and out?

→

Impact Assessment
Where are the big impacts?

→

Interpretation
What do the results mean? What next?

ITERATIVE PROCESS

Stages inform each other

LCA helps answer questions like:

- Where are the biggest emissions?
- Which materials have the highest impact?
- Would repair, reuse or recycling make a real difference?

LCA findings can be used for:

- Product development
- Strategic planning
- Capacity building
- Portfolio review
- Organisational footprint

THE FUTURE OF CIRCULAR WA

WESTERN AUSTRALIA HAS A UNIQUE CHANCE TO STRENGTHEN LOCAL CIRCULAR SYSTEMS.

By focusing on repair, remanufacturing, and material recovery within the state, WA can create regional jobs, reduce transport emissions, and keep more value in local communities.

FUTURE OPPORTUNITIES

- **Local remanufacturing:** Expand repair and refurbishment of electronics, machinery, and appliances.
- **Circular business models:** Businesses adopting refill, return, and product-as-is service systems to reduce imported packaging.
- **Regional job creation:** More repair cafés, community workshops, and second-hand material hubs.
- **Local manufacturing:** Turn recycled plastics, timber, and other materials into WA-made products like pallets, pipes, and street furniture.
- **Supply chain resilience:** Reduce dependence on imported materials through local repair, reuse, and recycling.

CURRENT LOCAL EXAMPLES

- **Food waste:** Local composting facilities turn household food waste into soil conditioners for WA agriculture.
- **Tyres:** End-of-life tyres are processed in WA for roads, playgrounds, and civil works.
- **Building materials:** Bricks, timber, and concrete are sorted and reprocessed locally.
- **Containers and glass:** Recycled construction and demolition waste is used in civil infrastructure such as for road base.
- **Electronics:** Refurbished through the NTCRS; batteries sorted and processed locally.

FUTURE MADE IN AUSTRALIA

Future Made in Australia is a national industrial strategy aiming to grow local production, clean energy and advanced manufacturing, backed by significant Commonwealth investment over the next decade.

WHERE TO START

CIRCULAR ACTION STARTS WITH EACH OF US. HERE'S HOW WE CAN ALL PLAY OUR PART.

WA BUSINESSES: START HERE

- Audit your waste streams and material use.
- Identify your top three material cost drivers.
- Update procurement to prioritise recycled, local and circular suppliers.
- Explore product stewardship and circular supply schemes.
- Partner with local service providers for repair, recovery or remanufacturing.
- Engage and train your staff on circular practices.
- Educate your customers about repair, reuse and responsible disposal.

WHAT DO WE NEED TO MAKE OUR WORLD MORE CIRCULAR?

- Policies that support circular economy practices.
- Collaboration across all sectors and stakeholders.
- Businesses adopting circular business models.
- Circular cities and infrastructure.
- Local governments enabling and promoting circular initiatives.

WA HOUSEHOLDS: START HERE

- Buy less and choose quality.
- Prioritise reuse, repair, and sharing.
- Participate in Containers for Change.
- Avoid fast fashion and single-use items.
- Compost organics and minimise food waste.
- Support local, circular businesses.

THIS GUIDE HAS BEEN PREPARED BY
SWITCH YOUR THINKING
WITH HELP FROM DONUT WASTE

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To access resources cited in this guide, visit
www.switchyourthinking.com/resources/

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