Accelerating SA's transition to a circular economy

SOUTH AUSTRALIA'S WASTE STRATEGY 2025-2030

Government of South Australia

Green Industries SA

Green Industries SA acknowledges and respects the Traditional Custodians whose ancestral lands we live and work upon, and pays respect to their Elders past, present and emerging. We acknowledge and respect their deep spiritual connections, and the relationship that Aboriginal and Torres Strait Islander people have to Country.

We extend our respect to all Aboriginal and Torres Strait Islander peoples and their nations in South Australia, and across Australia.

Green Industries SA also acknowledges that where Aboriginal and Torres Strait Islander people have a genuine say in the design and delivery of policies, programs and services that affect them, better life outcomes are achieved. Co-design is the preferred method of identifying and delivering the outcomes sought by communities in relation to projects, policies and programs that impact Aboriginal and/or Torres Strait Islander peoples.

Learn more about our Reconciliation at
greenindustries.sa.gov.au/reconciliation

Artist - Karen Briggs

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A message from the Minister

South Australians have a long and proud history of leadership in waste avoidance and resource recovery. From establishing the nation's first container deposit scheme in 1977 to rolling out 3-bin kerbside systems, introducing bans on problematic materials and investing in new recycling infrastructure, our state continues to set the standard. More recently, South Australia has again led the way with world-first bans on single-use plastics.

Yet, despite these achievements, our current patterns of production and consumption remain unsustainable. Resource recovery and recycling are vital, but they alone cannot secure a sustainable future. Around the world we are already seeing the consequences of crossing planetary boundaries, including climate change and biodiversity loss. To meet our commitments under the United Nations' 2030 Agenda for Sustainable Development, we must accelerate the shift away from the outdated linear 'take, make, waste' model towards a truly circular economy that transforms the way we produce, consume and value resources.

For South Australia, this transition will reduce environmental impacts, ease pressures on natural resources, and play a critical role in addressing climate change – given that 45% of global emissions come from how we produce and consume goods and materials. Sending food waste to landfill, for example, produces the potent greenhouse gas methane and generates the equivalent of 2.1kg CO_2 per kilogram disposed. The circular economy transition will also create new industries, generate jobs and enhance prosperity for current and future generations.

This strategy sets out the pathway and priorities to achieve a just, inclusive, and circular economy. By working together across government, industry and the community, we can deliver on these priorities, accelerate progress, and ensure South Australia remains a leader in building a safe, sustainable and prosperous future.

Hon Lucy Hood MP

Minister for Climate, Environment and Water

A message from the Presiding Member

Green Industries SA (GISA) is proud to lead South Australia's transition to a circular economy – one that strengthens our economy, sustains our environment and enhances community wellbeing.

As an enabler and driver of change, GISA works through strong partnerships and collaborations that build productivity, resilience and resource efficiency. We support businesses to adopt sustainable practices, fund innovations that generate jobs and tackle emerging waste challenges, and deliver leading work in disaster waste management, circular economy education and resource recovery infrastructure planning.

The 2025–2030 strategy builds on this foundation. It sets ambitious goals and identifies priority actions that extend our focus from resource recovery to waste avoidance and resource efficiency. By improving product design, using materials more effectively, and making informed choices about what and how we consume, we can cut waste and pollution, lower greenhouse gas emissions and regenerate natural systems.

The principles of a circular economy are clear: design out waste and pollution, keep products and materials in circulation at their highest value, and conserve and restore natural resources. The challenge – and opportunity – lies in putting these principles into practice. Doing so will strengthen business sustainability, reward innovation, support workforce reskilling, create new jobs and encourage collaboration across all sectors.

This transition requires shared responsibility. Governments, industry, communities and households must work together to ensure progress. The 2025–2030 strategy provides the pathway to a more circular, resilient and prosperous South Australia – delivering benefits now and for generations to come.

Nikki Govan AM

Presiding Member
Board of Green Industries SA

Introduction

In 2020, the Government of South Australia released *Supporting the circular economy: South Australia's waste strategy 2020-2025*. Developed by Green Industries SA (GISA), the comprehensive strategy provided a framework of goals, targets and priority actions to help the state create a sustainable economy by reducing our state's reliance on virgin resources, eliminating waste and pollution, and reducing greenhouse gas (GHG) emissions. A lot has been achieved in the past 5 years but there is work still to be done.

About this strategy

Accelerating SA's transition to a circular economy: South Australia's waste strategy 2025–2030 builds on its predecessor while taking account of changing local, national and international trends, challenges, commitments and opportunities. It sets a framework of strategic objectives, targets and priority actions that will accelerate SA's transition to a circular economy and help meet our priorities for a sustainable economy and net zero emissions by 2050.

While everyone has a role to play in implementing the strategy, for the first time those who will take a lead or partner role in each of the actions have been listed, along with timeframes for all actions. GISA will work with action leads to track and report on progress against the strategy's actions in addition to reporting on progress towards targets.

Acknowledgements

This strategy has been developed in collaboration with the Environment Protection Authority (EPA) and with input from numerous stakeholders via submissions received during public consultation on the draft strategy. These include federal and state government departments and agencies, local government, peak bodies and non-government organisations, industry and business, and the broader community.

GISA acknowledges and thanks the Commonwealth Scientific Industrial Research Organisation (CSIRO) for providing state-level material flow data that has informed the strategy's circular economy goals and targets.

About Green Industries SA

Green Industries SA (GISA) is driving a sustainable economic, social and environmental South Australia through a circular economy. It is working to eliminate waste and to maximise the value of resources, to enhance the economy and the natural environment for a sustainable future.

GISA is a leader in the circular economy, supporting efforts to value our resources and reduce pollution and waste. Its vision is to create a sustainable future, focusing on the value of materials in a circular economy and providing economic, social and environmental benefits. GISA has a statutory responsibility to develop a state waste strategy at least once every 5 years.

Its objectives under the *Green Industries SA Act 2004* (the Act) are to:

- promote waste management practices that, as far as possible, eliminate waste or its consignment to landfill

- promote innovation and business activity in the waste management, resource recovery and green industry sectors, recognising these areas present valuable opportunities to contribute to the state's economic growth.

In doing this GISA is to have regard to the guiding principles set out in the Act[1] these being:

- the circular economy

- the waste management hierarchy

- ecologically sustainable development

- best-practice methods and standards in waste management and efficient use of resources.

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1 See Appendix A for an explanation of the guiding principles.

Background and context

South Australia has a long and proud history of leadership in resource recovery and waste avoidance. Despite our achievements, our current patterns of production and consumption are unsustainable. While resource recovery and recycling are an essential part of the transition away from the 'take-make-waste' approach of a linear economy, it's not enough to ensure a sustainable future.

Globally we have gone beyond planetary boundaries, causing environmental impacts such as climate change and biodiversity loss. If Australia is to meet its commitments under the United Nations' 2030 Agenda for Sustainable Development, we need to accelerate the transition to a more circular economy to achieve the system-wide transformation that's required. This transition is essential to reducing our reliance on virgin resources, eliminating waste and pollution, tackling biodiversity loss, and achieving net zero emissions while supporting the needs of current and future generations of South Australians.

Circular economy

The circular economy is an economic model designed to prioritise sustainability, resource efficiency, and waste reduction. It aims to move away from the traditional linear economic model and instead seeks to create a closed loop system where products and materials are kept in use for as long as possible, with their value preserved and waste minimised. This requires a transformation in our ways of producing and consuming, to gradually de-couple economic activity from the consumption of finite resources.

Design out waste and pollution
As up to 80% of a product's environmental impact is determined in the design phase, all products should be designed, accessed and used in ways that eliminate waste and pollution.

Keep products and materials in use at their highest value
By keeping products in use and materials circulating for as long as possible at their highest value use, we retain the value embedded in them. This minimises waste and reduces the requirement for virgin resources.

Conserve natural resources and regenerate nature
Circular economies shift the focus from extraction of natural resources to regeneration of nature through reducing the use of virgin resources, reducing waste and pollution, and returning valuable organic materials and nutrients to soils.

Achieving this will require systems-wide approaches with cooperation up, down and across supply chains to share resources, design better goods and services, and innovate. Large-scale change is always disruptive, and shifting to a more circular economy will require coordinated action, commitment, and investment. It will also require policy settings and tools that support this kind of collaboration and shared action.

Significant benefits can be realised through moving to a circular economy. These are explored in Appendix B.

Global and domestic challenges

To explore the opportunities and address current and emerging challenges within a South Australian circular economy context, a holistic understanding of the relevant global and domestic issues of concern is needed. Key issues are set out below.

Climate Change

- 2024 was the hottest year on record at 1.55 +/- 0.13 °C above the pre-industrial average
- Concentrations of greenhouse gases continue to rise
- Climate-related events are becoming more frequent and more intense
- SA is predicted to experience more very hot days, droughts and dangerous fire weather and longer and hotter heat waves

[World Meteorological Organization, 2025], [Environment Protection Authority, 2023]

Fourfold increase in resource extraction

- Global resource extraction reached 106.6 billion tonnes in 2024, 4 times as much as in 1970

[World Business Council for Sustainable Development, 2024]

Unsustainable production and consumption

- One-third of all extracted material is discarded within a year
- Material use is the single largest determinant of Australian energy use and emissions, responsible for more than 50% of our global warming

[United Nations Environment Programme, 2024a], [Miatto A. , et al., 2024]

Growing waste generation

- Every year across the globe more than 2 billion tonnes of municipal solid waste (MSW) is generated

[United Nations Environment Programme, 2024b]

Biodiversity decline

- Globally, biodiversity is declining faster than at any time in human history
- Australia's rich and unique biodiversity is in serious decline and the number of threatened species is increasing

[Conference of the Parties to the Convention on Biological Diversity, 2022], [Department of Climate Change, Energy, the Environment and Water, 2021]

Population growth

- SA's population is projected to grow to more than 2 million by 2031, an increase of 204,000 to 254,000 from 2021
- Greater Adelaide's population of 1.52 million is projected to grow to between 1.82 to 2.01 million over the next 30 years

[State Planning Commission, 2025]

> ❝ **It is still possible to create a better, more sustainable, and more inclusive world for all by 2030. But the clock is running out. We must act now, and act boldly."**
>
> UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS REPORT 2024

The challenges presented by these key issues inform us there is need to:

Reduce environmental harm and regenerate nature by:

- minimising the generation of waste

- reducing pollution through preventing the release of hazardous substances throughout the life cycle of products and materials

- limiting GHG emissions

- reducing nutrient loss in food systems by recovering nutrients for recycling into agricultural production.

Reduce demand for resource extraction by:

- changing the way materials and goods are produced and consumed, including designing for longevity and circularity

- becoming more efficient in how resources are used and retaining their use and value in the economy

- using fewer virgin materials to meet consumption needs, including through a circular built environment

- raising consumer awareness about sustainability and developing circular economy knowledge and skills

- shifting consumption patterns to goods and services that are less material intensive.

With these challenges, however, come opportunities. This strategy identifies the priority areas and actions that need to be taken in SA that will have the biggest impact, to accelerate the state's transition to a circular economy.

What this strategy means for you

Transitioning from an entrenched linear 'take-make-waste' economy to a circular economy is complex and requires that South Australians work together to achieve the changes required. The responsibility for implementation of the strategy will be shared across government, business, industry, communities and individuals. Everyone needs to do their part.

This table outlines some of the ways this strategy applies to each group, sector and tier of government. The list of detailed actions is located under the focus areas section of this strategy.

Table 1: What this strategy means for you

Group	Action
Individuals	• Make sustainable consumption choices and minimise waste • Support circular initiatives such as repair cafes, libraries, and second-hand marketplaces, including by donating responsibly
Households	• Separate waste into the correct kerbside bins • Take non-kerbside-recyclable waste, including batteries and embedded battery products, to appropriate drop-off points • Minimise food waste by using up ingredients that you already have, and storing food for maximum shelf life
Not-for-profit organisations and community groups	• Create community-led initiatives, like repair hubs, swap centres, sharing groups, clean-up campaigns and community gardens with composting • Advocate for a more sustainable and circular economy • Implement community education campaigns to drive behaviour change
Research institutions	• Undertake and publish innovative research to drive the circular economy forward • Partner with businesses, industry and entrepreneurs to develop innovative solutions • Evaluate policies, programs and initiatives that contribute to the circular economy transition
Education sector	• Educate and develop workforce knowledge and skills to meet the current and future needs of the circular economy
Business sector	• Adopt circular practices to meet growing stakeholder and customer expectations, ensure compliance and capitalise on new market opportunities • Donate unsold edible food to food rescue charities for redistribution
Resource recovery and waste management industry	• Process end-of-life material into new products with high circularity outcomes • Provide safe and appropriate waste management and disposal pathways • Provide source-separating collection systems to businesses and industry
Local government	• Deliver and educate communities on high-performing kerbside collection systems • Adopt circular procurement policies and practices • Support community-led initiatives like repair hubs and swap centres • Support adaptive reuse of existing building stock
State government	• Implement policies, regulations and financial incentives that accelerate and support the transition to a circular economy • Encourage and facilitate collaboration and behaviour change across sectors • Use government procurement to drive changes in market behaviour and set an example for the private sector to follow • Advocate for national product stewardship schemes to address problematic wastes or implement state-based schemes or other interim measures where appropriate • Show leadership in implementing adaptive reuse and responsible design and construction approaches

2020–2025 waste strategy progress to date

Since the 2020–2025 waste strategy was released, significant progress has been made. Highlights include:

Tackling problematic waste

- ✔ The rollout and implementation of **single-use plastics bans** in SA has continued.

- ✔ A national commitment has been made to **reform the way packaging is regulated in Australia**, including mandated obligations for packaging design.

- ✔ New industry-led **national product stewardship schemes** have been established.

Reducing waste and recovering valuable resources

- ✔ SA recovered 4.47 million tonnes of material in 2023–24 at a **recovery rate of 83.2%**, with an estimated total value of **$783** million.

- ✔ GISA's *Waste and Recycling at Events and Venues guideline* is helping minimise waste and recover recyclables at South Australian events, and implementation of GISA's *Government office waste: Strategy and better-practice guide* is increasing waste diversion within SA government offices.

- ✔ **Public place recycling** is occurring through the Rundle Mall, Holdfast Bay and Tea Tree Gully public place bin projects.

Addressing food waste

- ✔ **3-bin kerbside services for households**, incorporating a kitchen caddy and compostable bags for food waste, are provided by all 19 metropolitan councils, and **changes to kerbside waste collection systems** have been trialled and implemented by several councils in metropolitan Adelaide and regional centres, supported by the release of GISA's *Sustainable Kerbside Services: Better Practice Guide*, resulting in improved resource recovery rates for food organics.

- ✔ **Barrier bags for fruit, vegetables, nuts and confectionery** are now required to be certified compostable, providing improved access to compostable bags to support household food waste diversion and reduce the risk of contamination of the organic waste stream.

- ✔ Funding has been provided by the South Australian and Australian governments to increase infrastructure processing capability and capacity under the **Food Waste for Healthy Soils** program.

- ✔ GISA's involvement in **End Food Waste Australia CRC** projects has helped to provide insights on household food waste generation and management, understanding of date labelling and has supported field trials of tailored compost formulations.

- ✔ GISA's partnership with **Saveful** has helped households to save food and save money.

- ✔ GISA has provided more than **$200,000 in grant funding to support food rescue charities** with infrastructure.

Community, business, council and householder education and engagement

- ✔ GISA's *Which Bin* program, running since 2019, provides statewide recycling and waste avoidance advice for households, helping SA maintain its lead in landfill diversion.

- ✔ GISA's *Replace the Waste* program supports SA's single-use plastic bans by providing information to the community on what items have been banned, and educating businesses on compliant alternatives, leading to the removal of nearly 12 million plastic items from the environment.

- ✔ The *Circular Community Hubs Guide*, launched in 2024, provides guidance to developers, councils and planners in considering opportunities to develop circular community hubs.

Regulatory reform

- ✓ Implementation by EPA of the **2019 waste reform amendments**, including waste levy collections, stockpile management and mass balance reporting has provided an improved regulatory framework to minimise risk of environmental harm, give more certainty and fairness for lawful operators, and promote investment, innovation and growth of the sector.

- ✓ The **review of SA's Container Deposit Scheme (CDS)** will modernise the scheme, which will include expanding the scope of the scheme to include wine and spirit bottles, expanding the pathways available to return containers, improving convenience of returns as well as the process of returning the container materials to the market for recycling.

- ✓ The *review of the Environment Protection (Waste to Resources) Policy 2010* has an overarching ambition to modernise the policy to support and enable circular outcomes.

Business sustainability

- ✓ GISA's **Business Sustainability Program** continues to support businesses of all sizes and from all industry sectors to 'go beyond compliance' and work towards implementing sustainability, circularity and net zero initiatives. Between 2020 and 2025, the Business Sustainability Program provided **$1.38m in grant funding** to deliver 45 projects across 26 industry sectors and 403 business sites, produced **14 resources for business**, and developed and published **8 tools and guides**.

Investment in infrastructure

- ✓ **30 recycling infrastructure projects across regional SA and Adelaide** have attracted **$42.8 million** of co-investment from the South Australian and Australian governments.

- ✓ A **soft plastics recycling facility** is being built in Kilburn, with private investment and co-funding from the Australian Government's Recycling Modernisation Fund – Plastics Technology stream.

- ✓ **3 materials recovery facilities** now operate in metropolitan Adelaide, and investment in upgrades to increase **material recovery capacity and capabilities** will improve recycled material outputs.

Development of end-markets

- ✓ **$2.1 million** in **Circular Economy Market Development Grant funding** was provided to 35 projects, supporting end market development and the adoption and scaling-up of circular business models and practices.

- ✓ GISA's **Circular Procurement Knowledge Hub** provides a knowledge and information sharing platform for circular procurement in SA, supporting markets for circular and recycled content products.

Circular built environment

- ✓ The *Circular economy in South Australia's built environment – Action Plan*, developed by industry, will help drive the transition of our built environment from linear to circular.

- ✓ The **City of Adelaide's** *Adaptive Reuse City Housing Initiative* is unlocking the potential in underutilised buildings in the City of Adelaide to create new homes.

Repair and reuse

- ✓ The *South Australian Repair and Maintenance Services Sector Study* has mapped the current state of repair in SA, identifying existing barriers to repair and opportunities for growth, and the **SA Reuse Data Study** is being undertaken to understand the scale and impact of reuse activities in SA.

Data capture and reporting

- ✓ The 2022 **C&I waste audit of metropolitan SA** has improved understanding of the composition of mixed commercial and industrial (C&I) waste in metropolitan Adelaide, helping to inform opportunities to improve recycling, and enabling the development of better data modelling of the circularity of materials.

- ✓ **Improvements and expansion in data collection and modelling** is ongoing, with mass balance data and updated landfill split modelling incorporated into the Circular Economy Resource Recovery Report (CERRR), and quantifying and representing material flows.

Examples of SA's circular economy in action

Refuse

- South Australians use their reusable cups for take-away coffees instead of disposable cups
- In 2024 WOMADelaide avoided the disposal of more than 100,000 single-use plastic cups by replacing them with reusable cups

Rethink

- In consultation with their communities, progressive councils are providing weekly FOGO bin and fortnightly landfill bin collections, rethinking the way kerbside bins are used and collected
- Fleurieu Milk Company's reusable milk kegs and glass bottle model has reduced the need for plastic milk bottles in cafés and restaurants, saving 7,000 single-use plastic bottles over the lifetime of one keg

Reduce

- Food rescue charities, such as FoodBank and Oz Harvest, collect and distribute unsold edible food to those experiencing food insecurity
- Raw Bulk Wholefoods in Victor Harbor allows customers to purchase unpackaged products, reducing packaging waste

Redesign

- Compostable fruit and vegetable barrier bags have replaced plastic barrier bags, supporting efforts to divert food waste away from landfill
- RM Williams boots have been designed to be repaired, with individual components able to be replaced, rather than having to replace or repair multiple parts of the boot

Reuse

- Op shops, such as Vinnies and Salvos, receive and sell second-hand goods, giving them a second life
- SA Water's uniform reuse shop keeps corporate uniforms in use, preventing them from being disposed to landfill

Repair

- Clothing alteration and repair services in SA extend the life and utility of clothing
- Makerspace Adelaide is a not-for-profit community fabrication workshop that provides affordable access to a variety of tools and equipment

Refurbish

- Heritage buildings on Lot 14 (former Royal Adelaide Hospital site) have been refurbished for adaptive reuse as modern workplaces
- Arup refurbished their Adelaide office in the Reserve Bank Building using regenerative design, achieving Living Building Certification

Remanufacture

- APR Composites is a local manufacturer and designer of products made using Australian recycled and reclaimed materials for local and international markets
- Transmutation in Robe is making use of waste products to create and sell new products, for example, using unused plastic bread tags to create recycled plastic homewares

Repurpose

- The City of Adelaide's Adaptive Reuse for City Housing Initiative is repurposing underused existing buildings to create new homes
- Makerspace Adelaide is a community space where people can repurpose or upcycle old items into new ones

Recycle

- Orora's Gawler facility includes a beneficiation plant that closes the loop by processing used glass and recreating new glass bottles
- Recycling Plastics Australia in Kilburn will clean and purify soft plastics such as shopping bags and food wrappers to create feedstock for new soft plastic packaging

Research

- GISA's Women in Circular Economy Leadership Scholarship funds women leaders to undertake projects that create new ideas and innovation in waste, resource recovery and circular economy
- Bedford Group received funding from GISA to investigate melamine-coated particleboard circular manufacturing

Reskill

- SA has several repair cafés that help the community learn skills to repair and mend broken or damaged items
- The circular procurement knowledge hub on GISA's website is supporting businesses to capitalise on the opportunities of circular procurement

Recover

- Since 1977 SA's container deposit scheme has incentivised the return and recovery of valuable material
- Battery recycling scheme B-cycle facilitates the collection of used batteries for recycling

Regenerate nature

- Food and organic waste processed into compost in SA is applied to agricultural land to improve soil for food production
- By keeping materials circulating in SA's economy we are reducing waste and pollution that affect soil, water and air quality

Progress against 2025 targets for metropolitan Adelaide

While progress has been made against some targets set in the 2020–2025 waste strategy, 2023–24 data shows that only the construction and demolition (C&D) waste diversion target has been met. An improved data model for calculating diversion rates has shown that the C&I diversion rate is lower than previously thought but the diversion rates for the C&D and municipal solid waste (MSW) waste streams were performing better (Green Industries SA, 2025). What is clear is that aside from C&D waste, significant effort is still needed across the MSW and C&I waste streams to meet the targets.

As at 2023–24:

- MSW diversion rate was 67% against a target of 75%, with kerbside waste at 52% against a target of 60%

- C&I diversion rate was 78% against a target of 90%

- C&D diversion rate was 96% against a target of 95%.

Graphs depicting annual performance against the 2020–2025 waste strategy targets can be found in Appendix C.

What still needs to be addressed?

Despite significant progress being made across many areas, some priority areas require further focussed action through this strategy:

- **Waste generation per capita** – to meet our waste reduction targets, more focus is needed on reducing waste generation through consuming less material and using materials and products more efficiently and for longer.

- **MSW and C&I diversion rates** – to meet goals and targets for these waste streams, with particular focus on food waste, a step change is needed requiring consideration of policy levers and additional supporting measures to improve outcomes.

- **Contamination of kerbside collected bins** – reducing contamination of source-separated materials in kerbside food organics and garden organics (FOGO) and co-mingled recycling bins remains a priority and is reflected in the setting of new targets and actions to support achieving these targets.

- **Development and ongoing sustainability of end-markets for recovered resources** – strong and sustainable end markets drive demand for recycling and resource recovery, and support investment in research, development, and expansion of capacity. Sustainable procurement is identified as playing a key role in supporting these markets. While some progress has been made within state government on sustainable procurement, a whole-of-government approach is needed, coupled with the adoption of sustainable procurement practices by local government and business.

- **Progress on national product stewardship schemes** – while addressing existing and emerging problematic wastes becomes increasingly urgent, the development of new and effective schemes takes significant time and resourcing. This may require consideration of state-based approaches and/or interim measures to be implemented.

- **Reform of planning instruments** – decisions made under the current legislative framework have led, in some cases, to outcomes that inhibit or prevent best practice waste management practices. Resource recovery outcomes can be improved by ensuring waste management and circularity principles are considered in planning decisions.

What's changed since the 2020–2025 strategy?

Since the previous strategy was developed in 2020, many things have changed. Matters that have informed the 2025–2030 strategy include:

- the imposition of **overseas export bans** for unprocessed glass, tyres, plastics and paper and cardboard requiring investment in domestic reprocessing solutions and improved markets within Australia

- increased awareness about PFAS '**forever chemicals**' released into the environment

- growing numbers of **lithium-ion (Li-ion) batteries** being used, and the fire and safety risks arising from their incorrect use and disposal

- **new problematic waste streams** arising from the transition to renewable energy, creating challenges and presenting new resource recovery opportunities

- collapse of the national soft plastics collection and recycling program **REDcycle** in 2022

- growth of **fast fashion** and an increase in unsustainable consumption practices

- **rising cost of living pressures** impacting households and small businesses

- mandatory **climate-related financial disclosures** for many Australian companies commenced in January 2025

- growing awareness in the business sector of **ESG** (environmental, social, and governance) and sustainability

- impacts from a **global pandemic** (COVID-19) and significant **natural disasters** (bushfires and the 2022–23 River Murray flood)

- significant **advancement of circular economy policy development** at the international level, for example the European Commission adopting numerous measures identified in the 2020 Circular Economy Action Plan, and revising the circular economy monitoring framework in 2023

- adoption and commencement of **measuring against 3 new circular economy indicators** – circularity rate, material footprint and material productivity – by the Australian Government

- **progress by other Australian states and territories** in developing and implementing circular economy strategies, accompanied by enabling legislation and policies

- the development and planned development of significant **thermal energy from waste infrastructure** interstate and potential implications for achieving a circular economy.

Strategic direction

The development of the 2025–2030 strategy has been informed and driven by 5 key factors:

1. GISA's guiding principles: circular economy, waste management hierarchy, ecologically sustainable development, and best-practice methods and standards in waste management and efficient use of resources.

2. Global environmental imperatives that require urgent action, and related global and domestic policy trends and attitudes.

3. An appraisal of the South Australian landscape – our achievements to date, ongoing and emerging challenges, the opportunities of a circular economy, and SA's ongoing leadership in these areas.

4. Alignment with Australia's international commitments and national priorities, goals and targets.

5. The broader priorities and goals for the state's future.

Key factors 2 and 3 have been explored in earlier sections, and factors 4 and 5 are set out below. GISA's guiding principles (factor 1) are outlined in Appendix A, and broader legislative and policy context information is set out in Appendix D.

Progressing the priority actions within this strategy will contribute to meeting Australian and South Australian goals and priorities and drive our transition to a more circular economy. It will also contribute to meeting global sustainability imperatives, including the United Nations' Sustainable Development Goals (SDGs). Additionally, setting a clearly articulated policy, supported by an effective regulatory framework, can provide confidence for investment decisions, and a stable and efficient market.

United Nations Sustainable Development Goals

The United Nations *2030 Agenda for Sustainable Development*, endorsed in 2015 by 193 countries, including Australia, created 17 Sustainable Development Goals that form a roadmap for global development efforts to transform our world.

SDG 12 – *Responsible consumption and production* – commits signatories to making fundamental changes in the way that our societies produce and consume goods and services. The targets include:

*   By 2030, achieve the sustainable management and efficient use of natural resources.

*   By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.

*   By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

*   Promote public procurement practices that are sustainable, in accordance with national policies and priorities.

The *Sustainable Development Goals Report 2025* reports that food waste, food loss and electronic waste are reaching unprecedented levels, while rising consumption continues to drive increases in domestic material consumption and material footprint. The Report advises that responsible consumption and production require a comprehensive transformation across systems, policies, markets and behaviours, requiring a coordinated effort across governments, the private sector, civil society and consumers at large. (United Nations, 2025).

The transition to a circular economy can also contribute to the achievement of other SDGs, including:

*   SDG 6 – *Clean water and sanitation*

*   SDG 8 – *Decent work*

*   SDG 9 – *Industry, innovation and infrastructure*

*   SDG 11 – *Sustainable cities and communities*

*   SDG 13 – *Climate action*

*   SDG 14 – *Life below water*

*   SDG 15 – *Life on land.*

Australia's Circular Economy Framework: Doubling our circularity rate

Australia's Circular Economy Framework, released in December 2024, commits Australia for the first time to a national circular economy transition. The framework sets a goal to double the circularity of Australia's economy by 2035 from a baseline of 4.6%, addressing the entire life cycle of resources, from design and extraction to reuse.

To achieve this goal, the framework sets 3 targets that cover the front, middle and end of the product life cycle:

1. Shrink per capita material footprint by 10%   [front-end target]

2. Lift material productivity by 30%   [middle target]

3. Safely recover 80% of resources   [end target]

The framework identifies the following 4 priority sectors:

- Industry
- Built environment
- Food and agriculture
- Resources

And cross-cutting objectives:

- Innovation
- Systems thinking and circular economy skills
- Market development and investment
- Collaboration and place-based approaches
- Advanced resource recovery and recycling
- Behaviour change

2024 National Waste Policy Action Plan

The *2024 National Waste Policy Action Plan*, developed in line with the *2018 National Waste Policy*, sets out where Australia must focus its efforts to transition to a safe circular economy. The action plan supports Australia's engagement in SDG 12 on responsible consumption and production. It also supports *Australia's Circular Economy Framework*.

The 2024 action plan builds on the progress made under the 2019 action plan to achieve 7 targets:

1. Ban on export of waste plastic, paper, glass and tyres, commencing in the second half of 2020

2. Reduce total waste generated in Australia by 10% per person by 2030

3. 80% average resource recovery rate from all waste streams following the waste hierarchy, by 2030

4. Significantly increase the use of recycled content by governments and industry

5. Continued phase out of problematic and unnecessary plastics

6. Halve the amount of organic waste sent to landfill for disposal by 2030

7. Make comprehensive, economy-wide and timely data publicly available, to support better consumer, investment and policy decisions

The 2024 action plan identifies 3 priority areas:

1. Government legislation, regulation, policies, standards and guidelines

2. Investment in infrastructure, procurement and funding support

3. Market development and support through innovation, reducing barriers and generating demand

And it identifies the following waste materials as those where the greatest gains can be made against the targets:

- Organics (food and garden)
- Building and demolition
- Ash
- Hazardous waste
- Paper and cardboard
- Timber

It notes that C&D waste is a priority for target 2, and MSW and C&I waste are priorities for targets 3 and 6.

State and territory governments are developing implementation plans to support the 2024 action plan. The South Australian Government Implementation Plan 2025 is aligned with this strategy.

South Australian action on climate change

SA has targets to reduce net GHG emissions by at least 60% by 2030 (from 2005 levels) and to achieve net zero emissions by 2050. The state is making good progress towards these targets, with a 55% decrease in total net emissions from 2004-05 levels recorded in 2022-23 (Department for Environment and Water. n.d.).

In December 2024, the South Australian Government released *South Australia's Net Zero Strategy 2024-2030* which sets out the priorities and actions to help achieve these targets. Policy Priority 12 of the strategy is to 'support innovative waste management, recycling and resource recovery to increase circulation of materials and reduce emissions. (Department for Environment and Water, 2024).

To lead by example, the *Climate Ready Government* initiative outlines how the South Australian public sector will manage climate related risks and reduce GHG emissions in its operations, and includes the *Net Zero Emissions for Government Operations Program*, and requirements for public sector agencies to assess, manage and report climate-related risks and opportunities for public assets, services and operations.

To better prepare for, manage and adapt to the impacts of climate change, the *South Australian Government Climate Change Resilience and Adaptation Actions* outlines a range of actions to support efforts across all levels of government, business and the community.

The Department for Energy and Mining is developing an Energy White Paper which will set out SA's medium-to long-term energy policy as the state transitions to a net zero emissions future. The role of renewable energy technologies is essential to this future, and to support this, action needs to be taken to address the end-of-life stage of these technologies, and to encourage redesigning them for improved circularity.

South Australian Economic Statement

The South Australian Government's *South Australian Economic Statement* sets out a vision for a sustainable economy with a mission to capitalise on the global green transition – 'the state's early adoption of circular economy principles can also provide a path to prosperity through greater efficiency and sustainability'.

South Australia's Advanced Manufacturing Strategy

The *South Australian Economic Statement* also identifies the importance of SA's manufacturing industry in the global green transition. This is built on through the *2023 Advanced Manufacturing Strategy* which identifies 6 strategic priorities to develop a globally competitive and productive manufacturing capability, and embrace sovereign manufacturing in a circular, net zero industrial future. One of these is 'Circular Economy – Increase competitiveness, innovation, economic profitability, and environmental benefits from the adoption of circular economy principles of reducing waste, keeping materials in use longer and regenerating natural systems'.

The key actions within the Advanced Manufacturing Strategy are:

- Circular Economy and Sustainability – funding and resources to help implement circular and sustainable business practices.

- Sustainable Procurement Policy – achieving circularity and net zero emissions through government procurement.

- SA ZERO – industry cluster working with state government agencies and academia to support decarbonisation and circular economy strategies.

[Department for Industry, Innovation and Science, 2023]

South Australia's State Infrastructure Strategy

South Australia's 20-year State Infrastructure Strategy 2025 was released in March 2025. The strategy looks at statewide infrastructure needs to 2045, with a focus on infrastructure planning and investments that drive a growing economy, aligned to the state's economic vision of a smart, sustainable and inclusive economy. Outcome 3, Shaping a sustainable future, includes consideration of the transition to a circular economy and the management of waste, especially from renewable energy technologies and the built environment.

South Australian regional plans

The *Greater Adelaide Regional Plan* was released in March 2025, setting the vision for how the city and region will grow sustainably over the next 15 to 30 years. The plan identifies future land needs for housing and employment, while ensuring Greater Adelaide remains a vibrant, liveable, and prosperous place for generations to come. The plan acknowledges the importance of providing land for waste and resource recovery, access to waste collection services, and the transition to a circular built environment, and identifies both short-term actions and long-term strategic objectives to achieve these goals.

Six new country regional plans are currently being developed for Kangaroo Island, Yorke Peninsula and Mid North, Eyre and Western, Far North, Limestone Coast, and Murray Mallee. These plans will help shape the future of the regions by identifying land use and long-term infrastructure needs to support sustainable growth over the next 15 to 30 years.

Vision and objectives

Vision

To create a sustainable future, focusing on the value of materials in a circular economy and providing economic, social and environmental benefits.

Objectives

- Reduce reliance on virgin resources, minimise waste and pollution, and regenerate natural systems

- Prevent all avoidable waste being disposed to landfill

- Use our natural resources more efficiently, focusing on sectors that use the most resources and where potential for circularity is high

- Increase producer responsibility for products throughout their lifecycle, including through circular design and manufacturing

- Support business sustainability, and grow circular economy businesses and jobs

- Create a circular economy culture and enable sustainable consumption choices

- Continue South Australia's leadership in waste management and resource recovery, and accelerate our transition to a circular economy

Beyond 2030

The 2025–2030 strategy is a step in South Australia's journey to establishing a sustainable and circular economy, which will support the state's ambitions in achieving net zero emissions by 2050.

Looking towards 2050, life in a circular economy will look different to today.

If South Australia is to achieve a just and inclusive transition, a cultural shift will be seen – where sustainable living, wellbeing, social relations and resilience are prioritised over consumerism and linear consumption, with sustainable lifestyles being accessible and appealing to all.

Materials circularity, decreasing consumption per capita, and eliminating waste will go together with economic growth and development. Circular design and manufacturing practices, sustainable industrial development and innovative circular technologies and processes will enable the phase-out of linear and hazardous materials.

Urban environments and infrastructure will be designed according to circularity principles to be sustainable, more resilient and inclusive. Dispersed and place-based circularity solutions will connect businesses and industry with community enterprises, including in regional areas.

Small and medium-sized enterprises will drive innovation, create local jobs and foster local economic resilience. A culture of repair and reuse, including community-centred workshops and facilities, will support skills in fixing and upcycling.

Circularity will be mainstream and prominent in multilateral frameworks and agreements, enhancing collaboration and coordination at local, national and international levels.

Achieving the targets and actions of this 5-year strategy will accelerate South Australia's transition to a circular economy beyond 2030.

Goals and targets

The 2025–2030 strategy sets an overarching goal to double SA's circularity rate by 2035, supported by 7 targets.

The new circularity goal and targets for material footprint and material productivity align with the goal and targets in *Australia's Circular Economy Framework* (which also address SDG 12).

Targets relating to waste generation, resource recovery, and organic waste align with targets 2, 3 and 7 of the *National Waste Policy Action Plan* noting that the C&I, MSW and kerbside bin waste diversion targets have been retained from the previous strategy, reflecting that further action is required to achieve these within the additional 5-year timeframe.

Additional new targets reflect local challenges as well as opportunities that support the ambition to accelerate the development of SA's circular economy by improving material circularity, reducing contamination of recovered resources, and increasing circular consumption activities.

The strategy identifies 9 focus areas as the priority areas for action that provide the greatest opportunities to meet the strategy's objectives, goals and targets. They reflect the ongoing and emerging waste and resource recovery challenges that need to be addressed (such as waste generation, food waste, quantity and quality of recovered resource, and problematic wastes), as well as opportunities to improve circularity and circular outcomes, (such as developing circular markets and businesses, transforming the built environment, developing circular economy knowledge and skills and changing patterns of consumption). While net zero emissions is one of the 9 focus areas, given that a circular economy is essential to achieving net zero emissions, all focus areas and related actions contribute to this ambition. To ensure that the effectiveness of actions taken towards achieving goals and targets is measured, continual improvement in our measuring and collection of data is another priority area.

Overarching goal: Double SA's circularity rate by 2035

Circularity measures how much material input into an economy comes from recycled or reused sources. It indicates the proportion of resources that are cycled back into production rather than being disposed of as waste.

Outcome

Increasing South Australia's circularity rate will mean the state is becoming more efficient in how materials are reused and recycled, reducing demand for virgin resources.

Key focus areas

Areas 2, 3, 5 and 6 are key to achieving this overarching goal, while areas 1, 4 and 7 also contribute to this goal.

Meeting the target

Circularity rate can be increased by reducing consumption of virgin resources, improving resource efficiency, and increasing demand for products with recycled content. There are significant opportunities to increase circularity in the built environment and food provision systems, and by supporting end markets by embedding sustainable procurement practices into purchasing decisions by government and business.

Measuring progress

Progress will be measured through the change in circularity rate against a 2024 baseline of 4.4%.

In 2024, SA's circularity rate was around 4.4%, up from 3.4% in 2010. By contrast, Australia's circularity rate in 2024 was around 4.3%, up from 3.7% in 2010.

Figure 1: Circularity rate for South Australia and Australia
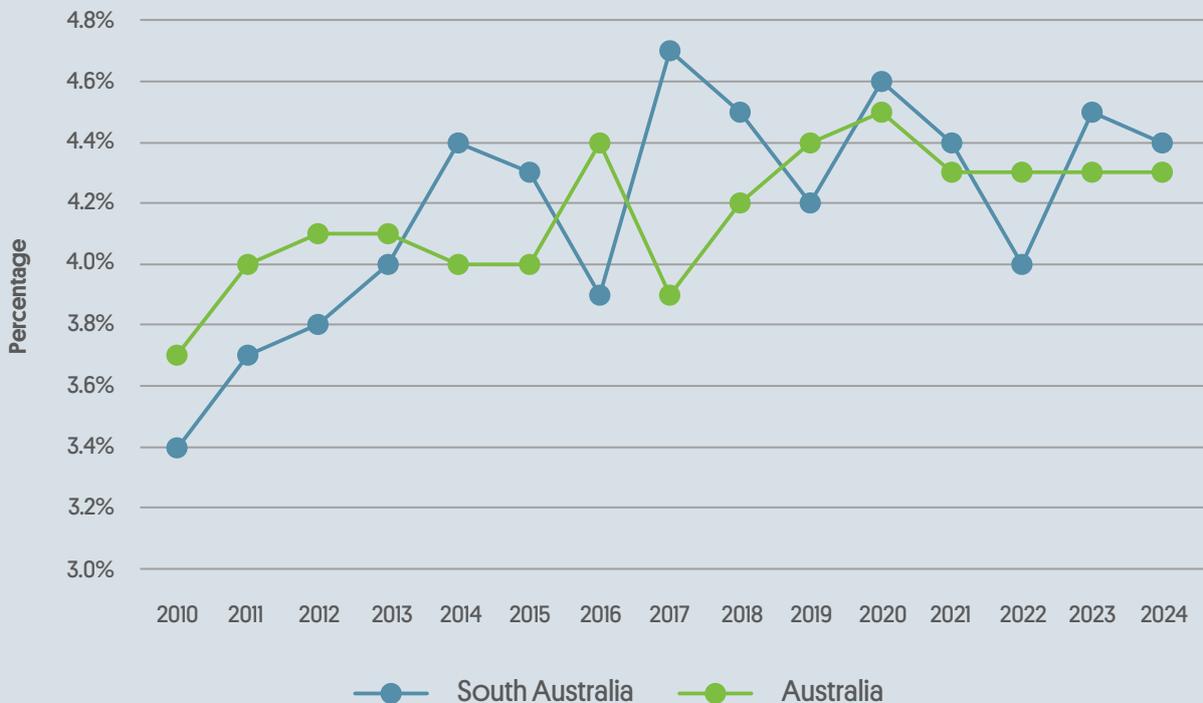
Source: SA data provided by the CSIRO. Australian data sourced from the Australian Bureau of Statistics website – Measuring What Matters.

Target 1: 10% reduction in material footprint by 2035

Material footprint measures the amount of raw materials extracted globally for use in products and services that South Australians consume. It includes materials used elsewhere to make imported products, and excludes materials used locally to make exported products.

Outcome

Reducing South Australia's material footprint will mean the state is using fewer raw materials – including from other countries – to meet consumption needs. Doing so will reduce the rate of global natural resource extraction and reduce our impact on the environment, biodiversity and the climate.

Key focus areas

Areas 1, 2, 5 and 6

Meeting the target

Material footprint can be reduced through actions in the key provision systems of housing, mobility and food, which are responsible for 75% of all material needs in SA.

These actions include reducing food waste, prioritising adaptive reuse and refurbishing over rebuilding, reusing and repairing products to extend their lifespan, designing products and materials for circularity and longevity, and changing consumption behaviours to buy less and to choose recycled content products.

Measuring progress

Progress towards this target will be monitored by measuring changes against a 2024 baseline of 34.2 tonnes per capita.

In 2024, SA's material footprint per capita was around 34.2 tonnes, up from 31.8 tonnes in 2010. By contrast, Australia's material footprint per capita was around 31.1 tonnes, the lowest it has been since 2010 (37.6 tonnes).
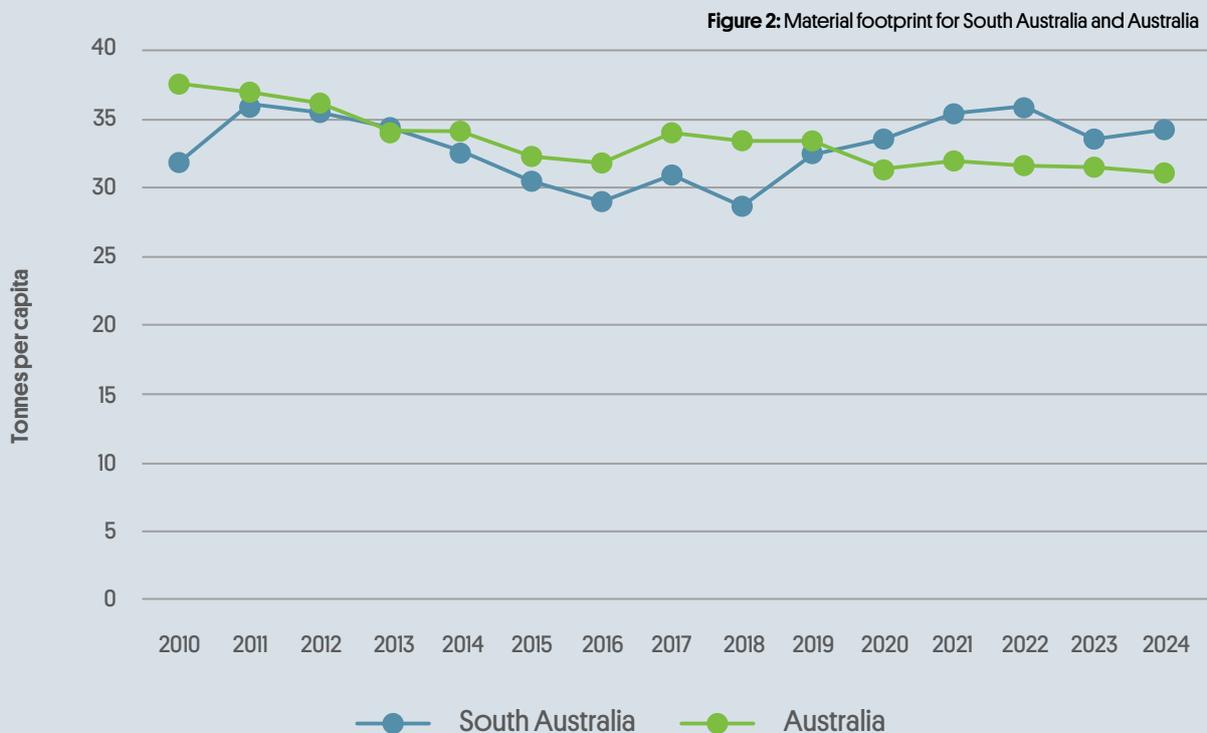
Figure 2: Material footprint for South Australia and Australia

Source: SA data provided by the CSIRO. Australian data sourced from the Australian Bureau of Statistics website – Measuring What Matters.

Target 2: 30% increase in material productivity by 2035

Material productivity measures how efficiently materials are used in a process or production. It measures the amount of economic output generated per unit of materials consumed.

Outcome

An increase in material productivity means that SA is becoming more efficient in how natural resources are used in production, and consumption patterns are shifting to less material intensive goods and services. It indicates that SA is decoupling economic activity from the consumption of finite resources. Achieving this target will reduce the pressure on natural resources and in particular finite resources.

Meeting the target

Material productivity can be increased by improving product design and manufacturing processes, encouraging innovation, increasing reuse and repair, reducing materials loss and valorising waste.

Key focus areas

Areas 1, 2, 5, 6 and 7

Measuring progress

Progress towards this target will be monitored by measuring changes against a 2024 baseline of $1.52 AUD/kg.

In 2024, SA's material productivity on a domestic material consumption basis was around $1.52 AUD/kg, up from $1.34 AUD/kg in 2010. This means there was $1.52 of GSP for each kilogram of material consumed by the economy. By contrast, Australia's material productivity in 2024 was around $2.04 AUD/kg, up from $1.86 AUD/kg in 2010.

Figure 3: Material productivity for South Australia and Australia

Source: SA data provided by the CSIRO. Australian data sourced from the Australian Bureau of Statistics website – Measuring What Matters.

Target 3: 10% reduction in total waste generated per person by 2030

This target measures the rate of waste generated relative to population.

Outcome

Reducing the amount of waste South Australia generates will reduce the amount of natural resources used, reduce pollution of the environment, and decrease the pressure on resource recovery and recycling infrastructure.

Key focus areas

Areas 1, 2, 4, and 6

Measuring progress

Progress towards this target will be monitored by measuring changes in waste generated per person, against a 2024 baseline of 2,264kg/person/yr.

Note that 'separately reported materials' are excluded for the purposes of this target. Separately reported materials comprise of clay, fines, rubble, soil and fly ash. These materials can fluctuate significantly across years, so by excluding them we can better measure the impact of the waste reduction strategies in this strategy.

Meeting the target

Achieving this target can be done by minimising waste generation across all waste streams, through strategies that maximise the lifetime of products and enable repair and reuse, and by changing our consumption patterns including reducing overall consumption. The priority material streams for action are as follows:

Priority material streams	Opportunities for waste reduction
Food waste	• Reducing household food waste • Reducing food waste in the C&I sector
Packaging waste	• Reduction in packaging • Reusable packaging
Plastic waste	• Bans on single-use plastics • Reusable alternatives to single-use plastic items
Textile waste	• Design for longer life and material circularity • Local repair and reuse
E-waste	• Products designed for longer life, repairability and recyclability • Local repair, refurbishment and reuse
Built environment waste	• Adaptive reuse and retrofitting of existing building stock • Renovation and refurbishment of existing houses • Deconstruction and salvage of materials during demolition • Minimising construction

Figure 4: South Australia's waste generation per person
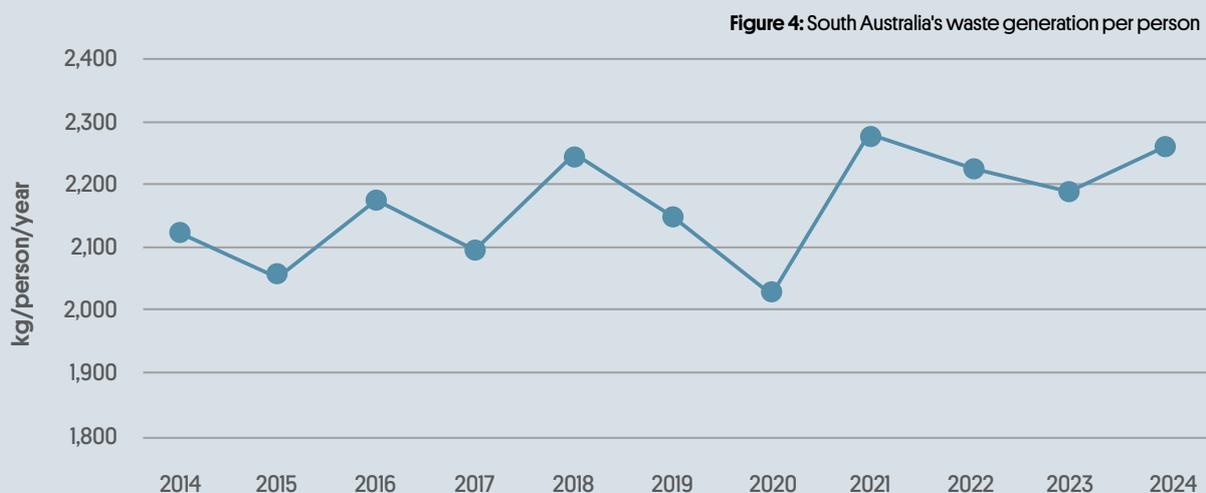
Target 4: Increase resource recovery and reduce contamination

Outcome

Keeping valuable resources circulating through the economy at their highest value and for as long as possible helps maximise our use of natural resources, and reduce pollution, GHG emissions from landfill and extraction of raw materials.

It is acknowledged that recovery rates will continue to be impacted by the existence of problematic items and legacy materials that are not safe or able to be recycled.

Targets by waste stream and location

While the overall goal is to increase resource recovery and reduce contamination across all waste streams and across SA, to reflect the different circumstances and approaches needed, targets are set by waste stream for metropolitan Adelaide, with goals set for regional, outback and remote SA.

Metropolitan Adelaide – 2030 targets by waste streams

Municipal solid waste targets

Municipal Solid Waste (MSW)	75% diversion
Kerbside bins	70% diversion

Kerbside bins contamination targets

Kerbside bins – FOGO	Less than 2% contamination
Kerbside bins – Recyclables	Less than 10% contamination

Meeting the targets

Significant gains can be made through increasing the recovery of organic waste through kerbside collection while minimising contamination. Actions to support this include providing households with sustainable kerbside bin systems enabling separation and collection of food waste, with targeted education campaigns.

Key focus areas

Areas 2, 3, 4, 6 and 7

Measuring progress

Diversion from landfill measures the amount of waste generated that's not sent to landfill. It is calculated as the total of waste recovered through resource recovery processes divided by the total amount of waste generated as a percentage. Progress towards diversion targets will be monitored by measuring changes in the rates of diversion from landfill.

Contamination rates will be measured through kerbside bin audits and reported as a percentage of volume by metropolitan council area. Progress will be monitored by measuring changes in rates of contamination of kerbside collected organic and recycling bins where kerbside bin audit results are available.

Metropolitan Adelaide – 2030 targets by waste streams (continued)

Commercial and industrial target

Commercial and Industrial (C&I)	90% diversion

Meeting the target

Increasing source separated recovery of unpackaged food waste, plus paper and cardboard, provide the largest opportunities to achieve this target.

Measuring progress

Progress towards diversion targets will be monitored by measuring changes in the rates of diversion from landfill.

Key focus areas

Areas 1, 2, 3, 5 and 7

Construction and demolition target

Construction and Demolition (C&D)	98% diversion

Meeting the target

The diversion rate for the C&D waste stream should consistently remain high.

Priority actions for the C&D sector are focused more on reducing waste, maximising material circularity and prioritising the use of recovered materials over virgin materials.

Key focus areas

Areas 3, 6 and 7

Measuring progress

Progress towards diversion targets will be monitored by measuring changes in the rates of diversion from landfill.

Regional, outback and remote SA – 2030 goals

	Goals
Regional local government	Regional local governments to meet and progressively improve upon the targets and goals set out in their respective waste management plans/strategies.
Outback and remote SA	Outback and remote communities, with support where appropriate from key stakeholders (including mining, tourism, national parks and transport sectors, pastoral companies, and local government neighbours) to strive for continual improvement in waste management and resource recovery.

Meeting the goals

Localised strategies, place-based solutions and collaborative area wide initiatives can better address the needs and ambitions for waste management, resource recovery and circular economy outcomes within regional, outback and remote SA communities.

Key focus areas

Areas 2, 3, 5 and 7

Measuring progress

Local government
Progress towards this goal will be measured by the progress of regional local governments towards achieving their waste management and resource recovery targets and goals, and through progressively setting more ambitious targets.

Outback and remote SA
Progress towards this goal will be measured by the progress made towards developing and implementing local strategies and place-based solutions.

Target 5: 50% reduction in organics disposed to MSW kerbside and C&I landfill bins by 2030

This target measures the reduction in organic materials being disposed to landfill bins.

Outcome

Food waste is minimised, and organic materials are diverted from landfill and used at their highest beneficial value, which helps regenerate soils and reduce GHG emissions.

Meeting the target

Meeting this target requires a combination of waste avoidance and resource recovery strategies.

Avoiding wasting food provides the highest environmental benefit and should be prioritised. This includes minimising waste in food production, avoiding overproduction of food, food waste valorisation, diverting edible food to food rescue charities or animal feed, and purchasing only what is needed.

Food waste, garden organic waste and other organic waste (such as compostable food packaging), can be separated for collection and processing into high quality organic products such as compost, that can be returned to soil, helping to regenerate nature and grow food.

Key focus areas

Areas 1, 2, 3, 5 and 7

Measuring progress

The 2022 baseline for kerbside organic waste disposed to landfill bins is 118,000 tonnes.

The 2022 baseline for the C&I organic waste disposed to landfill bins is 101,270 tonnes.

Progress against this target will be measured by monitoring changes to the rate of organic material being disposed by households in kerbside general (landfill) waste bins and changes to the rate of organic material being disposed by businesses in C&I landfill bins (general waste and dry general waste streams).

Target 6: Maximise material circularity

Material circularity measures how long and intensively a material continues to circulate through the economy.

Outcome

Recovered materials are used at their highest value and repurposed or remanufactured into quality products in a way that continually achieves a high circularity outcome, through a closed-loop system.

High circularity

A high circularity outcome is achieved when products are made back into their original form, conserving the value of the material and achieving a high-quality output. For example, when glass bottles are remanufactured into glass bottles, food grade plastic is remanufactured back into food grade plastic, and rubber is remanufactured back into rubber products.

For organic materials, a high circularity outcome is achieved when the recovered material is processed to meet Australian Standard (AS) 4454 then processed further to be of sufficient quality that the resulting product can be applied to soils for the purpose of food production, that is, in commercial viticulture, horticulture or agriculture. This outcome achieves the regeneration of our natural resources through a closed-loop system where food waste is produced back into food.

Low circularity

A low circularity outcome is when the material is downcycled through being remanufactured into a different product of lesser value or quality, or into a new product that cannot be recycled, resulting in the loss of value. For example, when glass bottles are used in road base, or plastic bottles are remanufactured into carpeting (which currently is not able to be recycled in Australia). For recovered organic materials, a low circularity outcome is when the material is processed to meet AS 4454 but not used for food production applications.

Measuring progress

Work has commenced to develop a methodology to measure progress against this target. The methodology will capture (by material stream) the circularity of inputs, circularity of outputs, and longevity of products in the material stream.

Meeting the target

For materials to continue circulating through the economy and result in high quality recovered material outputs, a multifaceted approach is required:

- Products and the materials used within them should be non-hazardous to human health and the environment and designed for easy disassembly and material recovery.

- Recyclable materials need to be separated at the source and aggregated for collection while contamination is minimised.

- Advanced sorting processes and recycling technologies must enable and maximise the recovery and extraction of materials, producing safe, high quality secondary materials as feedstock.

- Secondary materials should be used at their highest value.

Material	Opportunities for greater material circularity
Organic material	- Food waste recovery from both MSW and C&I sectors - Commercial composting outputs meeting high circularity outcomes
Plastics & plastic packaging	- Reduction in packaging - Reusable packaging - Redesign packaging for recyclability
Textiles	- Design for longer life and material circularity - Local repair and reuse - Local recycling
Cardboard & paper	- Reusable packaging - Source separation and collections in C&I sector
Consumer electronics	- Design for longer life and repairability - Local repair and reuse

Key focus areas

Areas 2, 3, 4 and 5

Target 7: Increase circular consumption activities

Circular consumption activities include repair and maintenance, upcycling, refurbishment, sale/purchase of second-hand goods, leasing or renting items, sharing or borrowing items. These activities extend the utility and lifespan of products and consequentially reduce waste.

Outcome

Consumers have convenient access to good quality circular products and services and choose to participate in circular consumption, maximising the lifespan and utility of products and reducing waste.

Meeting the target

Progress towards increasing circular consumption activities will be made through providing:

- Consumer awareness raising and product labelling to change consumption habits.

- Options for consumers to choose circular designed products and packaging, and circular services.

- Convenient access to repair, reuse and sharing services and options, such as community-based and commercial reuse and repair centres or circular hubs.

Key focus areas

Areas 1, 4 and 7

Measuring progress

Work has commenced to select the circular consumption activities and behaviours that will be measured, establish baseline measurements and commence monitoring of selected indicators.

Ongoing collection of this data will enable targets to be set during the term of this strategy or in a subsequent strategy.
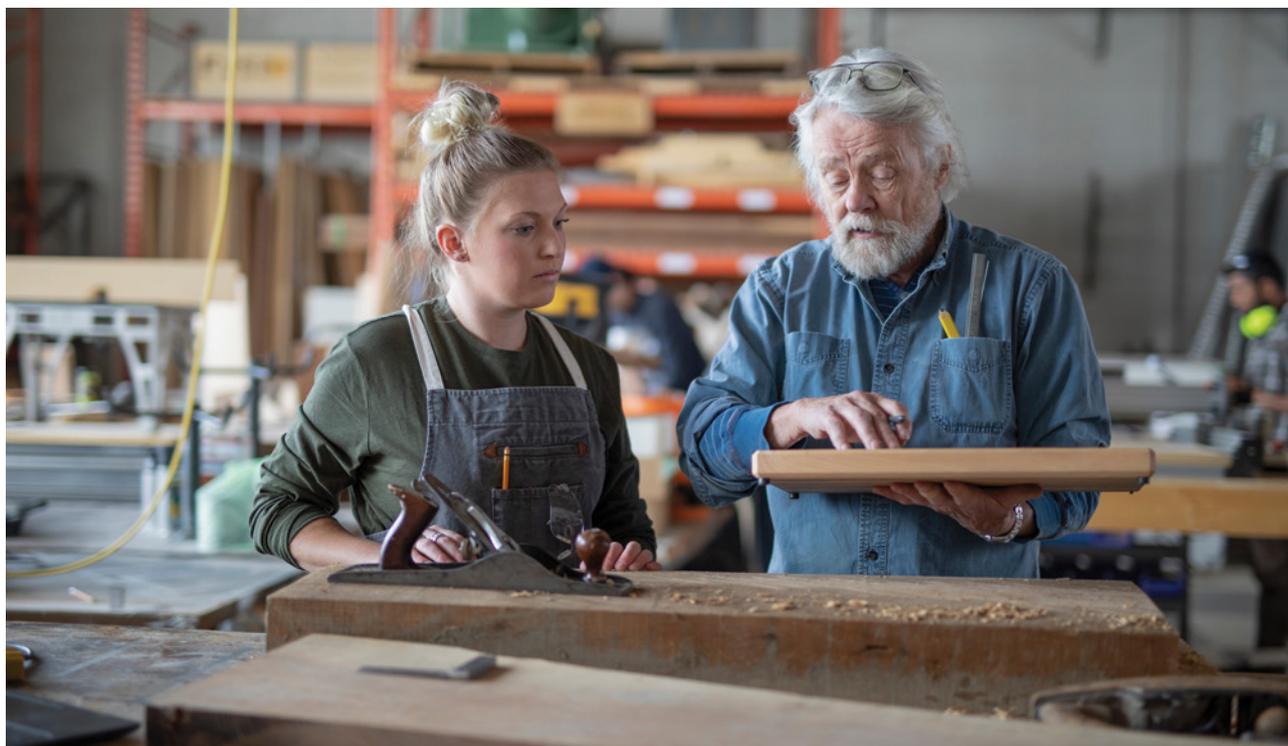
Focus areas and priority actions

Focus area 1: Avoid waste

In 2023–24, South Australia generated a total of 5.38 Mt of waste (Green Industries SA, 2025). Excluding separately reported material (clay, fines, rubble, soil and fly ash), this totalled 4.26 Mt of waste, equating to 2,264 kg per person. To meet the target to reduce waste generation by 10% per person, this needs to be reduced to 2,038kg per person by 2030.

The extraction and processing of material resources accounts for more than 55% of global GHG emissions (United Nations Environment Programme, 2024a), making reducing consumption and avoiding waste a critical part of reducing emissions and mitigating the effects of climate change.

The generation of waste can be reduced by designing out waste and pollution, shifting patterns of consumption to consume fewer resources, extending the useful life of products through repair and reuse, and using resources and materials more efficiently. The 11R circular economy strategies, from refuse through to recover (Figure 5) describe how best to avoid waste, preferencing lower numbered Rs, where possible, to minimise material consumption, maximise material productivity and reduce waste generation.

Circular economy ↑ **Increasing circularity** — **Linear economy**

Strategies

Figure 5: 11R circular economy strategies

Smarter product use and manufacture

R0: Refuse — Prevent the use of resources by avoiding the need to use the product at all

R1: Rethink — Explore alternative options that minimise or avoid the consumption of resources, including sharing or repurposing what you already have

R2: Reduce — Increase efficiency in product manufacture or use by consuming fewer natural resources and materials

R3: Redesign — Make choices at the design stage to reduce material footprint, eliminate problematic or hazardous materials, and enable reuse, repair and recycling of the product

Extend lifespan of product and its parts

R4: Reuse — Reuse by another consumer of a discarded product which is still in good condition and fulfills its original function

R5: Repair — Repair and maintain a defective product so it can be used for its original function

R6: Refurbish — Restore an old product to bring it up-to-date

R7: Remanufacture — Use parts of a discarded product in a new product with the same function

R8: Repurpose — Use discarded product or its parts in a new product with a different function

Useful application of materials

R9: Recycle — Reprocess materials for use as a secondary raw material for new products, at their highest value

R10: Recover — Incineration of material with energy recovery, or one-off uses, such as operational use of recovered materials within a waste facility or landfill

Circular design

As much as 80% of a product's environmental impact is determined at the design stage [Ellen MacArthur Foundation, 2022]. The way products are designed and produced influences how long they last, whether they can be repaired, and what happens to them at end-of-life.

While some brands are already designing for circularity, others continue to design in a way which maximises profit, without regard for or considering the costs of environmental impact. For example, many products are currently designed for obsolescence rather than for repair, reuse, disassembly and recycling. This can be done either through the design of the product, or through software-based measures. Other examples include the use of composite or problematic materials, including chemicals of concern, which limits recyclability, and the use of non-reusable fasteners or complex architectures which can limit repair. Software-based measures which limit repair and reuse include part pairing or firmware locks to prevent independent repair, and premature ceasing of software and security updates that make a product obsolete while it is still physically functional.

It is recognised that redesigning products for durability, reuse, and repair may increase the material footprint of the product, however, this is offset by the material productivity gains of an extended product lifespan.

To facilitate this design shift economy-wide, national or state-based reform may be needed. Product stewardship can encourage and support design changes, by making producers responsible for products throughout their lifespan. Actions relating to product stewardship are identified in focus area 4.

Shifting patterns of consumption

Consumers play a key role in the transition to a circular economy, with the volume, frequency and type of products consumed having a strong impact on waste generation and the environment. While consumer values and priorities are a significant factor in consumption patterns, these are affected by the behaviour of brands in marketing and design practices, as well as the information available to consumers to make informed decisions.

Surveys show many Australians value sustainability, with 46% of Australian shoppers reporting that it is an important factor when making a retail purchase. Durability and repairability are the most important considerations [Australian Consumer and Retail Studies, 2024].

Circular consumption is not just about buying products which are more sustainable – it's also about finding options which don't require a new product to be purchased. This can include rethinking the need to own the product (such as by leasing or sharing), repairing existing products, or buying second-hand. While many of these services exist already, they can be challenging for consumers to find and access.

Reuse and repair

Reuse and repair of products not only contributes to waste avoidance, they have the added benefit of creating more jobs as these activities are more labour intensive than recycling or landfill activities [Heinrich, De Garis, & Rawson, 2024] [Raillard, 2021].

'Reuse' refers to the reallocation of products or materials to a new owner or purpose without the need for reprocessing or remanufacturing. While reuse is a popular option due to reduced prices compared to purchasing new, barriers do exist, including products not being designed or manufactured to last or to be repairable.

The reuse sector in South Australia is varied, with a wide range of business selling second-hand products including clothing, furniture, electronics and cars. There is also a thriving informal peer-to-peer reuse market, through a range of online platforms such as Facebook Marketplace, eBay, and buy nothing groups, as well as garage sales and in-person sharing.

Repair and maintenance are important enablers for reuse. Unfortunately, the South Australian repair sector is shrinking and fragmented, and due to a lack of training opportunities for those wanting to work in this sector, it is largely made up of an ageing workforce. Action is needed to revive it and see it thrive.

Community initiatives, including second-hand marketplaces, repair cafes, and peer-to-peer sharing networks, can also support social outcomes. These include access to affordable goods, support for charitable and social programs through revenue from the sale of donated goods, volunteering and employment opportunities, improved social cohesion, and community engagement in the circular economy. Appendix B includes further information on the social and economic benefits of reuse and repair.

Using resources and materials more efficiently

The C&I sector generated 2.09kt of waste in 2023–24, making up 39% of the total waste in South Australia (Green Industries SA, 2025). Strategies to reduce waste in this sector include identifying opportunities to avoid waste and increasing the material efficiency of how goods are produced.

Some businesses don't have a clear line of sight on the quantities and types of wastes they are generating, which limits their ability to improve sustainability in their business practices. By developing waste reduction plans and measuring the amount of waste and the waste material types they generate, businesses can make informed decisions to address wasteful practices, increase productivity of their input resources, improve sustainability and save on costs.

Targeted programs to build business capabilities and the provision of 'better practice guides' can support businesses to improve their business practices and become more sustainable. Many of these 'better practice guides' have already been developed by GISA.

Objectives

Reduce the generation of waste through:

- designing products for circularity, including to eliminate waste and pollution, provide longevity and enable repairability
- keeping products and materials in use for as long as possible and at their highest value, reducing demand for virgin resources, conserving energy, and mitigating GHG emissions
- reducing wasteful consumption by preferencing circular consumption options
- addressing wasteful business practices by building business awareness and capabilities
- adopting production practices that increase material productivity

In addition to the actions below, actions identified in other focus areas, including food waste, built environment, procurement, and circular business practices, also contribute to waste avoidance.

ACTIONS TO AVOID WASTE				
	Action	Leads	Partners	Timing
Encourage circular design				
1.1	Advocate for and support the national adoption of design standards to increase life cycle potential of products, packaging and components, maximise the value of materials throughout the life of a product, and avoid waste – for example, design standards that ensure products are easier to repair, upgrade, disassemble and recycle, are durable, and use non-toxic ingredients or materials.	Environment Protection Authority Green Industries SA		2025 – ongoing
	In the absence of a national approach, explore legislative options for nationally aligned (where possible) state-based action, to ensure that goods manufactured in or entering South Australia meet certain design standards.			2027 – ongoing
1.2	Advocate for the design and manufacturing of products and components that increase durability, repairability and recyclability and replace virgin materials with recycled materials.	Green Industries SA	Industry associations Manufacturers	Ongoing

ACTIONS TO AVOID WASTE				
	Action	**Leads**	**Partners**	**Timing**
Encourage circular consumption choices				
1.3	Collect data and conduct market research to help inform behavioural change activities that promote waste avoidance.	Green Industries SA		Ongoing
1.4	Raise awareness with consumers to influence consumption habits and promote waste avoidance.	Green Industries SA		Ongoing
1.5	Support initiatives involving collaborative consumption and the development of community circular hubs, that is, physical locations that provide citizens with convenient access to a suite of circular goods and services.	Green Industries SA	Community groups Local government	Ongoing
1.6	Encourage community support of local circular initiatives such as repair cafes, libraries and second-hand marketplaces.	Green Industries SA	Community groups Not-for-profit organisations Local government	Ongoing
Support reuse and repair activities				
1.7	Advocate for and support the national adoption of design standards that ensure that products are durable and easier to repair and upgrade. In the absence of a national approach, explore legislative options for nationally aligned (where possible) state-based action, to ensure that goods manufactured in or entering South Australia meet design standards that enable product repair and reuse.	Environment Protection Authority Green Industries SA		2025 – ongoing 2027 – ongoing
1.8	Advocate for measures that overcome barriers to the reuse and repair economy, such as addressing the interplay between product warranties and product repair, and taxation policy measures.	Green Industries SA	Consumer and Business Services	Ongoing
1.9	Explore options to support the growth of the South Australian reuse and repair sector, for example through: • establishing community-based and commercial reuse and repair centres or hubs • establishing a South Australian repair network or alliance • developing a directory and map of repair and reuse services.	Green Industries SA	Reuse and repair sector	2025–2028
1.10	Develop and deliver community education and awareness programs to encourage reuse and repair to support the growth of the South Australian reuse and repair sector.	Green Industries SA		Ongoing
1.11	Support the development of repair skills, identified through a workforce skills gap analysis, at all levels of education.	South Australian Skills Commission Department of State Development Department for Education TAFE SA	South Australian Skills Commission's Industry Skills Councils Reuse and repair sector	Commencing 2027

ACTIONS TO AVOID WASTE			
Action	**Leads**	**Partners**	**Timing**
Support businesses and organisations to avoid waste			
1.12 Deliver targeted programs to build businesses' capability to: • identify and act on opportunities to avoid waste • increase materials efficiency • adopt innovative technologies and practices to measure and report on waste management activities.	Green Industries SA	Department of State Development SA Business Chamber Industry associations	Ongoing
1.13 Consider reform for South Australian businesses to develop business waste reduction plans, supported by the development of 'better practice' guides to assist with implementation.	Environment Protection Authority Green Industries SA		2025–2030
1.14 Require reasonable compliance (as determined by the South Australian Tourism Commission) with the *Waste and Recycling at Events and Venues Guidelines* for state government managed or sponsored major events.	South Australian Tourism Commission	Green Industries SA	Ongoing
1.15[2] All state government offices and administration buildings to implement the *Government office waste: Strategy and better-practice guide.*	State government departments and agencies	Green Industries SA	By 1 July 2027
1.16 Develop and encourage the adoption of a standardised template for waste reporting by waste collection contractors to their customers, to simplify data collection and enable customers to make informed decisions. The template should include, at a minimum: • the classification of the material stream • the weight of the waste or recyclables collected (if known) • where each material stream will be taken (disposal facility) and the method of disposal/processing (such as recycling, landfill, energy recovery) • the waste levy charge relating to the collected waste.	Green Industries SA		2025–2030
1.17 Support the adoption of bin weighing systems for C&I collected waste and recyclables, to enable waste collection contractors to provide this data to customers.	Green Industries SA	Waste and resource recovery industry	Ongoing

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2   Action 1.15 is aligned with Action 5.3 of the *South Australian Government Climate Change Resilience and Adaptation Actions*.

Focus area 2: Reduce food waste

The United Nations Environment Programme's (UNEP) Food Waste Index ranks Australia as the 10th most wasteful country in the world (United Nations Environment Programme, 2021). Nationwide, Australians waste 7.6 million tonnes of food every year at a cost of $36.6 billion per year to the economy (Food Innovation Australia Limited, 2021).

Food waste is generated at all stages of the food supply chain, including production, processing, distribution, and consumption. 2.06 million tonnes of food is wasted through the manufacturing, distribution, wholesale and retail stages and a further 1.47 million tonnes of food waste is generated by the hospitality sector and institutions (Food Innovation Australia Limited, 2021).

Around 30% of food waste is generated in the home. This equates to 2.5 million tonnes per annum, costing the average household around $2,700 per year. It is estimated that 77% of food waste in South Australian agriculture is produce that is not harvested or is ploughed in (Arcadis, 2019). The remaining 23% is recovered via food rescue and diversion to animal feed (Food Innovation Australia Limited, 2021).

Approximately 70% of wasted food is edible (Food Innovation Australia Limited, 2021). While edible food is being discarded to landfill, 32% of Australian households experienced moderate to severe food insecurity in 2024 (FoodBank, 2024).

When disposed in landfills, food waste produces methane, a potent GHG (28 times more potent than carbon dioxide). Every kilogram of food wasted generates the equivalent of 2.1 kg in CO_2 (Department of Climate Change, Energy, the Environment and Water, 2023b). Food waste sent to landfill is responsible for 3% of Australia's emissions annually, excluding the embodied energy and resources from the production of the wasted food (Department of Climate Change, Energy, the Environment and Water, 2024d).

Our commitments to reduce food waste

UN SDG target 12.3

By 2030, halve per capita global food waste at the retail and consumer levels and reduce losses along production and supply chains, including postharvest losses.

National Waste Policy Action Plan

Halve the amount of organic waste sent to landfill for disposal by 2030.

These commitments are supported by:

Australia's Circular Economy Framework

Reducing food waste and valorising agricultural waste are priority areas.

Australian Food Pact

A voluntary initiative that focuses on preventing waste, promoting food reuse and donation and achieving supply chain transformation and innovation.

In 2021, South Australia released its first food waste strategy for 2020–2025, *Valuing Our Food Waste – South Australia's strategy to reduce and divert household and business food waste*. The strategy outlines actions across 3 areas to reduce food waste from households and businesses while supporting the transition to a materially circular economy through infrastructure and market development for the organics sector. Many of the targets and actions outlined in the strategy have been progressed through GISA activities and projects.

Reducing food waste continues to be a priority area for action, and actions under the food waste strategy are now incorporated into this strategy.

A food waste hierarchy (Figure 6) has been developed to inform the priority of actions and outcomes for food waste using the same principles as the waste management hierarchy. The food waste hierarchy supports the highest utilisation of food and continued flow of materials and nutrients within a biological circular economy, as seen in Figure 7.

Figure 6: Food waste hierarchy

Most preferable

CIRCULAR

Prevention

Source prevention

- Source prevention at each stage of the food system to reduce waste of raw materials, ingredients and products

Re-use

Nourish communities

- Surplus edible food is redistributed through food relief charities or other redistribution pathways
- Food is repurposed into new food products

Feed animals

- Direct to livestock feed

Recycling

Reprocessing

- Use of surplus food and by-products to produce new products, including meat rendering and alcohol extraction

Nutrient recovery

- Home composting
- Industrial composting of source separated inputs for manufacturing into soil improvement products for agricultural application
- Anaerobic digestion of source separated inputs, capturing energy with concurrent recovery of nutrients for application to soil
- Rapid food waste processing to dehydrate or decompose source separated food waste inputs ahead of incorporation into a composting or maturation process

Recovery

Energy recovery

- Anaerobic digestion process with disposal of digestate following energy recovery
- Incineration of food waste and other biomass to produce energy
- Suitable streams of source separated food waste are sent to wastewater treatment plants where biogas is recovered and biosolids recovered (bio-solids have limited applications and restrict the opportunities to maintain the circularity of valuable nutrients within higher-value uses)

NON-CIRCULAR

Disposal

Mechanical treatment of mixed waste

- Mechanical processing of general waste, following source separation (e.g. via 3-bin kerbside collection system), to extract residual food waste, with output used for operational purposes on landfill sites in accordance with EPA approvals and licence conditions

Disposal

- Discharge to sewer (with or without energy recovery)
- Disposal to landfill (with or without energy recovery)

Least preferable

INPUTS
- Water
- Chemical
- Energy

Food production and product manufacture

Consumer

Food Rescue

Animal Feed

Transformation of by-products

Soil regeneration

Segregated organics collection

- Soil improver
- Organic fertiliser
- Compost

- Composting
- Anaerobic digestion

Priorities

Preventing wastage of edible food

By supporting households to use up ingredients they already have and to store food for maximum shelf life, food waste can be minimised.

Businesses can adopt practices and strategies that minimise food waste and save money.

By increasing edible food donations, supported by the necessary infrastructure and systems, more food will be available for redistribution.

Minimising pre-farm gate food waste

Opportunities to reduce food waste that occurs pre-farm gate include minimising overproduction, collaboration through the supply chain and between retailers and primary producers, and valorising food waste into new products.

Diverting unavoidable food waste from landfill

This can be achieved through implementing high-performing source separation systems to recover food waste and minimise contamination, enabling the production of high-quality organic outputs that can be applied to soil to regenerate nature.

While all metropolitan Adelaide councils offer kerbside FOGO services, and many regional councils are implementing FOGO services where practical in townships, there is still a significant opportunity to increase the quantity and quality of food waste being diverted at the household level. Within the C&I sector, food organics make up 18.8% of mixed C&I waste, providing another opportunity to increase recovery of food waste [Rawtec, 2022].

Turning food waste into recycled organic compost for application to soil can help rebuild soil fertility and replenish soil carbon and nutrient stocks (including nitrogen and phosphorous). Compost has a high carbon content and contains beneficial microbes. Using recycled organic compost for agricultural purposes keeps the nutrients in the economic system and improves soil structure and water holding capacity, reduces the reliance on synthetic fertilisers, and helps soils sequester greater levels of carbon (Government of South Australia, 2022).

In SA, 83% of discarded organics are diverted from landfill, contributing $189 million to Gross State Product (GSP). The flow-on effects of improved productivity from application of AS certified recycled organics compost and mulches contributes an additional $190 million GSP to SA's economy (Green Industries SA, 2021).

Objectives

- Reduce food wasted across the supply chain, and the associated GHG emissions, and achieve the highest possible outcomes through the practical application of the food waste hierarchy (see Figure 6)

- Provide for high-performing food waste collection systems that support the separation of food waste as close as possible to the point of generation

- Improve the quality of recycled organics though investment in education to reduce contamination at source and infrastructure to process output materials

- Reduce nutrient loss in food systems by ensuring the valuable nutrients recovered through the collection of segregated food waste are recycled to agricultural production

- Improve and regenerate agricultural soil function through rebuilding soil fertility and replenishing soil carbon and nutrient stocks

ACTIONS TO REDUCE FOOD WASTE				
	Action	Leads	Partners	Timing
Avoid food waste				
2.1	Consider legislative reform for unsold edible food to be donated to food rescue charities for redistribution, accompanied by the necessary supporting systems, agreements, infrastructure, and capacity.	Environment Protection Authority Green Industries SA	SA Health Food rescue charities Supermarkets	2028–2030
2.2	Deliver co-contribution funding programs to increase infrastructure capacity of food rescue and expand social supermarkets.	Green Industries SA	Department of Human Services	2025–2030
2.3	Expand messaging on food waste avoidance actions in households, including through enabling technology and tools to help households use up foods they already have.	Green Industries SA		Ongoing
2.4	Develop resources to support and encourage businesses to take action to avoid and reduce food waste along the supply chain.	Green Industries SA	Food South Australia Australian Hotels Association SA South Australian Independent Retailers Restaurant & Catering Association SA Clubs SA	Ongoing

	ACTIONS TO REDUCE FOOD WASTE			
	Action	**Leads**	**Partners**	**Timing**
2.5	Explore strategies to support primary producers to achieve the highest value use of food and to minimise food waste pre-farm gate.	Department of Primary Industries and Regions Green Industries SA End Food Waste Australia	South Australian Research and Development Institute Primary Producers SA Food South Australia Supermarkets and produce markets	2025–2030
Increase recovery of food waste				
2.6	To increase the recovery of high-quality organics and food waste from the C&I sector, consider legislative reform to support mandatory source separation and collection of unpackaged organics from large food waste generating businesses.	Environment Protection Authority	Green Industries SA Food South Australia Business associations	2025–2028
2.7	Support the rollout of area-wide, high-performing food waste collection systems, including within suitable multi-unit and higher density residential developments.	Green Industries SA	Local government regional waste subsidiaries Waste and resource recovery industry Body corporate managers	Ongoing
2.8	Provide resources to support precincts to procure segregated organics collections from businesses within significant food retail areas.	Green Industries SA		Ongoing
Support quality outputs and end markets				
2.9	Encourage and support the establishment and enhancement of resource recovery infrastructure, processes and technologies that divert food waste into productive use.	Green Industries SA	Waste and resource recovery industry Organics recyclers Local government	Ongoing
2.10	Process segregated food waste from MSW and C&I waste streams to achieve high circularity outcomes.	Organics recyclers		Ongoing
2.11	Regulate to enhance the quality of recovered organics, including by promoting source segregation of organics and reduced contamination of organic feedstock.	Environment Protection Authority	Organics recyclers Waste and resource recovery industry Local government	Ongoing
2.12	Progress the development of a consistent input material list for commercial organics collections, ensuring segregation of organics from non-compostable packaging and other potential contaminants occurs at the source.	Green Industries SA	Organics recyclers	2026–2028
2.13	Support investment in activities that establish, build, and maintain markets for high circularity organic products, and meet quality demands of end market users.	Green Industries SA	Department of State Development	Ongoing

All actions in this focus area are aligned with Action 12.1 of *South Australia's Net Zero Strategy 2024-2030.*

Focus area 3: Reduce material loss and preserve value

A circular economy seeks to create a closed-loop system where resources are kept in use for as long as possible, with their value preserved and waste minimised. Keeping resources in use through recycling end-of-life materials also contributes to GHG emission reduction and energy and water savings (see Appendix B for details).

To enable end-of-life products and materials to be safely recovered for subsequent use at their highest value, high-performing collection and resource recovery systems and practices need to be in place. Preventing or limiting contamination of recovered materials is also essential to securing quality feedstock for high-value recycling. Source separation (the separation of waste as close as possible to the point of generation), results in higher quality recovered resources than a bin system that relies on downstream processing technology to subsequently separate out the various materials. This applies to all waste streams – MSW, C&I and C&D.

Municipal solid waste

SA's kerbside performance demonstrates that a step-change is needed.

For household waste, having consistent, high-performing 3-bin systems (including kitchen caddy and compostable bags for food waste) across metropolitan Adelaide and large regional centres provides familiarity and convenience for households, which helps improve how they separate their waste and recyclables and place them into the correct bins for kerbside collection. This, coupled with community education and feedback, helps reduce the levels of contamination of kerbside collected household FOGO and co-mingled recycling bins.

Waste segregation and collections from multi-unit dwellings can be problematic where the necessary waste management infrastructure and/or access for standard waste collection vehicles is inadequate. These considerations need to be made at the design stage and through planning and development approval processes. Actions to consider legislative and policy changes to planning instruments are included in this strategy.

Across SA, 67.5% of dwellings have general waste bins with red lids while 32.5% of them have blue lids. Red is the Australian standard colour for general waste bin lids. Having a kerbside bin system with non-standardised bin lid colours can create confusion within the community and makes statewide communications and education on the correct bin to use more difficult.

Commercial and industrial waste

A significant opportunity exists to improve resource recovery in the C&I sector, particularly in metropolitan Adelaide. A 2022 audit of mixed C&I waste found the following 6 material streams make up the biggest components of this waste:

1. 18.9% paper and cardboard
2. 18.8% food waste (loose and packaged)
3. 13.6% plastic films
4. 13.1% wood (treated and untreated)
5. 8.5% non-recyclable plastic/expanded polystyrene
6. 7.2% textile materials.

[Rawtec, 2022]

Improvements can be achieved through businesses source separating their recyclable C&I waste (note that actions relating to food waste are located under focus area 2). As with kerbside bins, standardising C&I bin colours and markings would also help avoid confusion and ensure people are disposing of waste and recyclables in the correct bins.

Construction and demolition waste

While the rate of diversion from landfill for C&D waste is high, increased source separation of C&D waste and unused materials on construction sites can improve the quality of the recovered materials, supporting highest value reuse of the material and high-quality recycling. Deconstruction of buildings that have reached their end-of-life, rather than demolition, also enables increased source separation, and supports these same high value reuse and recycling outcomes. Focus area 6 – *Build a circular built environment* provides further detail on increasing resource recovery in the C&D sector, including through design practices.

Landfill bans

Banning additional materials that have a pathway for resource recovery and recycling from being disposed to landfill will help keep valuable materials circulating through the economy.

Resource recovery infrastructure

Waste and resource recovery infrastructure needs to meet existing requirements as well as plan for and accommodate future requirements. This includes consideration of capacity and capability for existing, as well as new and emerging wastes.

Metropolitan Adelaide

While all 19 metropolitan Adelaide councils offer a 3-bin kerbside service to households, (including FOGO, comingled recycling and general waste), not all households use these bins correctly. Education programs and other initiatives (including council roll-outs of sustainable kerbside service models) have led to some improvement in material recovery over recent years, particularly for food waste, however the 2025 kerbside diversion targets set by the 2020–2025 waste strategy have not been achieved.

Meeting the targets set by this strategy will require a significant increase in the rate of recovery for recyclable materials as well as a reduction of contamination in kerbside bins. Implementing a sustainable kerbside service model, as set out in the *SA Better Practice Guide: Sustainable Kerbside Services*, can help councils improve resource recovery outcomes. Enabling and supporting residents to put their waste and recyclables into the correct bins will also improve outcomes and reduce contamination of comingled recyclables and FOGO kerbside bins.

Regional SA

Regional SA faces challenges and opportunities that are unique to local areas as well as challenges that are common across councils, such as geographic size, lower and geographically dispersed populations, distance to processing facilities, disposal and markets, and the related high transport, processing and disposal costs. Incidences of illegal dumping and dealing with problematic wastes arising from agricultural sources such as copper chromated arsenate (CCA) treated timber posts and plastic wrap are also challenges. Problematic wastes are addressed under focus area 4.

While there are common challenges facing regional South Australian councils in relation to waste management and resource recovery, the differences in circumstances between regions means that a one-size-fits-all approach isn't appropriate. Opportunities exist for regional councils to develop place-based solutions that deliver increased source separation and efficiency for managing materials, through investing in regional resource recovery infrastructure including organics processing capability (such as mulching, composting, and small-scale bioenergy solutions) and upgrading transfer stations and resource recovery facilities where commercially feasible. The development of regional end markets for the recovered materials can support the sustainability of these solutions.

The development of regional circular economy roadmaps through the collaboration of stakeholders, including state and local governments, Regional Development Australia committees, universities, local businesses and communities, can help identify opportunities and encourage innovative place-based solutions to support the circular economy transition. Coupled with investment in regional circular economy and resource recovery infrastructure, end market development, and the development of circular economy skills and knowledge, this can lead to improved circular outcomes and create local employment.

Remote Aboriginal communities and Outback SA

Waste and resource recovery services in remote communities and Outback SA face a range of unique challenges due to their remoteness and lack of local waste and resource recovery infrastructure and capacity. This creates significant transport costs for materials that may have low commercial value as well as challenging end markets such as tyre waste. Waste from tourists travelling through Outback SA also poses a challenge.

Localised strategies can identify suitable opportunities for place-based solutions that address these challenges, and the support required to implement them.

Objectives

Support a circular economy through the application of best practice waste management and resource recovery that:

- maximises the safe recovery of recyclable materials

- provides for separation of materials as close as possible to the point of generation

- minimises contamination of recyclable materials

- maximise recycling efficiency at all stages (collection, preprocessing – including separation and sorting – and end processing) to reduce material losses

- enables the safe and beneficial use of recycled materials, achieves the highest value reuse, and does not pose a risk of environmental harm

ACTIONS TO REDUCE MATERIAL LOSS AND PRESERVE VALUE				
	Action	**Leads**	**Partners**	**Timing**
Legislative and policy enablers				
3.1	Progress legislative reform to require circular economy principles to be considered in EPA decision-making to preserve the value of materials and their continued circulation in the economy.	Environment Protection Authority	Green Industries SA	2025–2027
3.2	To increase the recovery of organics, food waste, and recyclables in household kerbside bins, consider legislative reform to support staged implementation of 3-bin kerbside collection systems for households, aligned with the *SA Better Practice Guide: Sustainable Kerbside Services*, initially for metropolitan Adelaide (stage 1) then consider extending to large regional centres and townships where current or planned local processing capacity exists (stage 2).	Environment Protection Authority	Green Industries SA	2025–2027 (stage 1) 2028 – ongoing (stage 2)
3.3[3]	Investigate legislative and policy reform to support the implementation of best practice waste management (including high-performing organics segregated collection systems) in residential and mixed-use developments, including student accommodation, as part of the planning and design process, to ensure new developments (including infill, medium and high-density) provide management solutions and allocate sufficient area to store and access 3-bin segregated waste and recycling services and to present bins for collection.	Green Industries SA Department for Housing and Urban Development		2025–2027
3.4	Consider legislative reform to provide for mandatory source separation and collection of comingled recyclables and organic waste for the C&I sector in metropolitan Adelaide, commencing with large waste-generating businesses.	Environment Protection Authority		2025–2028
3.5	Progress legislative measures to prevent inappropriate recombining of separately collected and aggregated waste and resource recovered materials.	Environment Protection Authority		2025–2027

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3   Action 3.3 is aligned with an action in the Waste and resource recovery section of the *Greater Adelaide Regional Plan*.

	ACTIONS TO REDUCE MATERIAL LOSS AND PRESERVE VALUE			
	Action	Leads	Partners	Timing
3.6	Progress legislative reform to: • enable EPA regulatory decision-making to support recovered resources being used at their highest value, to achieve high circularity outcomes • support the safe circulation of materials, where low-risk recovered materials can continue circulating, high-risk wastes are regulated, and high-concern chemicals are eliminated from material cycles.	Environment Protection Authority		2025–2027
3.7	Regulate to ensure that any energy recovery activities aren't removing valuable materials from the economy (that is, there are no other higher value use options available for those materials).	Environment Protection Authority		Ongoing
3.8[4]	Maximise the effectiveness and performance of South Australia's container deposit scheme (CDS). Stage 1: Governance and system modernisation, including the establishment of a not-for-profit scheme coordinator and enhanced IT systems. Stage 2: National harmonisation across 3 areas: 1. Scope of beverage containers 2. Deposit/refund values 3. Beverage container approvals Expansion of the CDS to include all beverage containers up to 3 litres, excluding plain milk, as formally committed to by the SA Government on 3 September 2025. This includes wine and spirit bottles, juice and cordial containers, and larger flavoured milk bottles.	Environment Protection Authority		Expected delivery: late 2027 Ongoing Expected delivery: late 2027
Municipal solid waste/Kerbside waste				
3.9	Contribute to national harmonisation of kerbside collections through implementation of the *National Kerbside Collections Roadmap*.	Green Industries SA Environment Protection Authority Local government		2025–2030
3.10	Support the roll-out of recycling and organic waste bins in suitable public places alongside general waste bins.	Green Industries SA	Local government	2026–2030
3.11	Adopt Australian Standard *AS 4123.5-2008 Mobile waste containers* for all new and replacement kerbside mobile waste containers.	Local government	Green Industries SA Local Government Association of SA	Commencing 2026
3.12	As local or regional waste and resource recovery plans or strategies are developed or updated, they: • align with the goals of the circular economy by incorporating circular economy principles and objectives • as a minimum, set targets for increasing diversion from landfill/recovery of resources.	Local government and regional waste subsidiaries	Local Government Association of SA	Commencing 2026

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4   Action 3.8 is aligned with Action 12.5 of *South Australia's Net Zero Strategy 2024-2030*.

	Action	Leads	Partners	Timing
ACTIONS TO REDUCE MATERIAL LOSS AND PRESERVE VALUE				
Commercial and industrial waste				
3.13	Adopt Australian Standard *AS 4123.5-2008 Mobile waste containers* for all new C&I mobile waste containers with capacities up to 1,700L.	Waste and resource recovery industry	Retail sector	Commencing 2026
3.14	Support businesses to increase source segregation of waste and reduce contamination, to secure quality feedstock for high-value recycling.	Green Industries SA	SA Business Chamber Industry associations	2025–2030
3.15	Progress legislative reform to prohibit disposal to landfill of C&I source segregated and collected organics.	Environment Protection Authority	Green Industries SA	2025–2027
Construction and demolition waste				
3.16	Promote segregation of materials on building sites to increase waste diversion of uncontaminated materials.	Green Industries SA	Building and construction industry Housing industry Green Building Council of Australia	Commencing 2025
Reduce material loss through landfill bans				
3.17	Consider and implement additional landfill bans for products or valuable materials that have a pathway for resource recovery and recycling.	Environment Protection Authority	Green Industries SA	2025–2030
Build resource recovery capacity and infrastructure				
3.18	Invest in high-performing resource recovery systems and infrastructure that support circular material flows and high value beneficial outcomes.	Waste and resource recovery industry	Green Industries SA Department of State Development	Ongoing
3.19	Advocate for product stewardship schemes to establish and maintain accessible and convenient community drop-off points for the products and materials included in the scheme, and promote their use.	Green Industries SA	Product stewardship scheme administrators Local government	Ongoing
3.20	Support the development of solutions for high-quality sorting and removal of contaminants from waste.	Green Industries SA	Waste and resource recovery industry	Ongoing
3.21	Develop a new circular economy and resource recovery infrastructure plan that supports the transition to a circular economy through waste projection modelling and an analysis of infrastructure needs, capacity and capability for existing and emerging waste streams.	Green Industries SA	Local Government Association of SA Waste and resource recovery industry	2025–2026
3.22[5]	Future-proof the operations of new and existing waste and resource recovery facilities by managing the interface and the encroachment of incompatible land uses.	Department for Housing and Urban Development		Ongoing

5   Action 3.22 is aligned with long-term strategic objective 2 in the Waste and resource recovery section of the *Greater Adelaide Regional Plan*.

ACTIONS TO REDUCE MATERIAL LOSS AND PRESERVE VALUE				
	Action	**Leads**	**Partners**	**Timing**
Metropolitan Adelaide				
3.23	Work with metropolitan Adelaide councils to: • implement the *SA Better Practice Guide: Sustainable Kerbside Services* • apply best practice segregated 3-bin waste management systems for medium and high density dwellings and be the preferred service provider for all residential dwellings, if the building can meet the service parameters as defined by each council.	Green Industries SA	Metropolitan Adelaide local government	Ongoing
3.24	Investigate options to enable a reduction in contamination rates in kerbside organics and recycling bins.	Green Industries SA	Metropolitan Adelaide local government and waste subsidiaries Local Government Association of SA	2026
3.25	To support the reduction of contamination rates in kerbside organics and recycling bins, in alignment with strategic targets, to: • monitor contamination • support local communities to correctly use kerbside recycling and organics bins • provide targeted assistance at the household level, where required.	Metropolitan Adelaide local government and waste subsidiaries Green Industries SA		Commencing 2026
Regional areas				
3.26	Work with regional councils to: • develop a regional-specific *SA Better Practice Guide: Sustainable Kerbside Services* incorporating regional case studies and roll-out examples • implement the regional *SA Better Practice Guide: Sustainable Kerbside Services* in large regional centres and townships where 3-bin kerbside systems are provided and current or planned local processing capacity exists, and other suitable areas with consideration of local circumstances • identify examples of innovative, practical and cost-effective approaches, and support development of guidance for low density regional and remote residential areas where 3-bin systems aren't appropriate.	Green Industries SA	Regional Local Government Associations Regional local government and waste subsidiaries	2027–2030
3.27	Investigate the development of regional circular economy, resource recovery and processing infrastructure, including incentivising the local processing and reuse of wastes, especially of organics.	Regional local government and waste subsidiaries	Green Industries SA Regional Local Government Associations	Ongoing

ACTIONS TO REDUCE MATERIAL LOSS AND PRESERVE VALUE				
	Action	Leads	Partners	Timing
3.28	Support the development of regional circular economy roadmaps and place-based solutions that achieve circular outcomes in regional areas. This could include capacity building, skills development, opportunities for reverse logistics, circular economy precincts, or end-market development.	Green Industries SA	Regional local governments Regional Local Government Associations SA Regional Development Australia Committees	Ongoing
Outback SA				
3.29	Improve waste management in Outback SA through: • improving management of unlicensed landfills • implementing more user pays household waste collection services • trialling innovative and fit for purpose technologies for waste management in communities where household waste collection services will not be viable.	Outback Communities Authority	Green Industries SA	Commencing 2025
3.30	Improve management (including responsible visitor communications) of tourist waste in Outback SA.	Outback Communities Authority	South Australian Tourism Commission National Parks and Wildlife Service – Department for Environment and Water Department for Infrastructure and Transport	Commencing 2025
3.31	Advocate for, and contribute to, the development of a nationally regulated product stewardship scheme for end-of life-tyres, to improve their collection and disposal in Outback SA, preventing stockpiling and reducing the associated health, environmental and emergency risks.	Outback Communities Authority Green Industries SA	Environment Protection Authority	2025–2027
3.32	Until a nationally regulated product stewardship scheme for end-of life-tyres is in place, progress interim measures to improve the management of end-of-life tyres in remote areas.	Outback Communities Authority Green Industries SA		2025–2027
3.33	Build capacity and increase access to resource recovery and waste management infrastructure for outback communities, including: • establishing resource recovery centres in strategic locations • improving waste and recycling collection and transport services.	Outback Communities Authority	Green Industries SA Waste and resource recovery industry	Commencing 2025
Remote Aboriginal communities				
3.34	In collaboration and partnership with First Nations peoples, support the development of a waste strategy for remote Aboriginal communities that identifies local solutions for sustainable waste management and resource recovery practices, builds local capacity and includes awareness raising activities.	Green Industries SA	First Nations partners	Commencing 2026

Focus area 4: Address emerging and problematic wastes

Technological innovation in the modern world has resulted in new waste streams, many of which do not yet have end-of-life solutions. Some of these products can be replaced with more sustainable alternatives, but others are essential for meeting our net zero emissions targets and mitigating the impacts of climate change. For these products, good design can improve end-of-life outcomes, but collection and recycling solutions are also needed to recover valuable materials and recirculate them through the economy. This can be achieved through regulation, other policy measures, or product stewardship.

Product stewardship acknowledges that producers, manufacturers, brands, importers and retailers placing products on the market have a responsibility to reduce the negative environmental and human health and safety impacts of those products. In addition to ensuring there is a recycling pathway for the product at the end of its usable life, a product stewardship approach can also encourage design changes to extend product lifespan, enable reuse, or improve recyclability and resource recovery. Product stewardship schemes can be either voluntary or mandatory, with the most appropriate approach dependent on the complexity of the market and industry willingness to take responsibility.

Some actions in this focus area relate to safeguarding human health and safety and preventing environmental harm. Until problematic products and materials are banned or redesigned, they will need to be managed in a way that reduces harm.

Objectives

- Design and manufacture products for longevity and circularity, including designing out problematic waste and hazardous materials

- Continue to phase out problematic and unnecessary plastic products

- Increase the safe recovery of resources for problematic wastes

- Provide safe collection and disposal pathways for hazardous waste

- Develop and implement national or nationally aligned product stewardship schemes for problematic wastes

- Raise community and consumer awareness of problematic wastes and options for their safe collection and management

ACTIONS TO ADDRESS EMERGING AND PROBLEMATIC WASTES				
	Action	Leads	Partners	Timing
4.1	Advocate for, support, and promote national solutions to problematic wastes, or consider state-based solutions if required, including product stewardship approaches that restrict hazardous materials, address end-of-life, encourage reuse and repair and eliminate problematic waste.	Green Industries SA Environment Protection Authority	Waste and resource recovery industry	Ongoing
4.2	Encourage and support research and innovation into circular solutions for problematic and emerging wastes, including design, alternatives, and end-of-life.	Green Industries SA	Commonwealth Scientific and Industrial Research Organisation Universities Cooperative Research Centres	Ongoing

Problematic and unnecessary plastics and plastic packaging

With global plastic production doubling in the 20 years preceding 2019, there is an urgent need to both reduce the amount of plastic being generated, and to increase the resource recovery of the remaining necessary plastics [CSIRO, 2024]. While plastic packaging can play a role in protecting food and reducing food waste when used effectively, half of all plastic produced is designed to be used only once and then thrown away, and of these, only an estimated 24% are recovered [Green Industries SA, 2025].

Some plastics are more challenging to recycle than others, which can be due to factors such as the polymer type, being combined with other materials including chemicals of concern, a lack of sustainable end markets, high contamination rates, or a combination of these factors. Plastics which have been more challenging to recover or recycle include packaging, soft plastics, and those used in primary industries. For these plastics products, intervention is needed to improve their design as well as collection and recycling.

South Australia has banned the sale and provision of a range of single-use plastic items under the *Single-use and Other Plastic Products [Waste Avoidance] Act 2020*. In December 2024, environment ministers, except Queensland, agreed to the release of a summary of the *National Roadmap: Harmonising action on problematic and unnecessary plastics* outlining how jurisdictions will work together to reduce variations on 24 items, without reversing existing measures [Department of Climate Change, Energy, the Environment and Water, 2025].

The Australian Government is progressing a new regulatory product stewardship scheme for packaging, which will include design guidance to increase packaging recyclability, and consider labelling, recycled content thresholds and bans or phase outs of chemicals of concern.

ACTIONS TO ADDRESS EMERGING AND PROBLEMATIC WASTES				
	Action	**Leads**	**Partners**	**Timing**
Problematic and unnecessary plastics and plastic packaging				
4.3	Support the national packaging reform process for packaging to be regulated under Commonwealth legislation, including addressing chemicals of concern.	Green Industries SA Environment Protection Authority	Australian Government	2025–2028
4.4	Continue to phase out single-use and other problematic and unnecessary plastic products in SA and consider other measures to address plastic use.	Green Industries SA Environment Protection Authority		Ongoing
4.5	Support national progress to develop a pathway and criteria to soft plastics collection and recycling at scale in Australia.	Green Industries SA		Ongoing
4.6	Continue to support primary industry sectors to identify and implement actions to better manage plastic waste.	Department of Primary Industries and Regions		Ongoing

Renewable energy technologies

South Australia is at the forefront of the global energy transition, having rapidly transitioned from less than 1% renewable electricity generation share in 2001 to about 74.3% in 2023–24 in terms of gross generation. Wind and solar now regularly supply all state demand for short periods, demonstrating high levels of integration. Furthermore, progress towards SA's legislated target of 100% net renewable electricity generation by 31 December 2027 reached 69.7% in 2023–24. With SA's commitment to achieve net zero emissions by 2050, the use of renewable energy technologies is an essential part of our efforts to reduce GHG emissions and limit the impacts of climate change.

The renewable energy technologies in use include home and grid scale solar photovoltaic (PV) systems, battery energy storage systems, and wind turbines. The infrastructure associated with these technologies will reach end-of-life over the coming years and decades, and solutions to ensure the valuable materials from these technologies can be recovered and recycled will be needed.

Wind turbines

Wind power is a significant part of SA's transition to net zero emissions, with wind generating more than 44% of SA's energy in 2021–2022 (Department for Energy and Mining, n.d.). SA's wind farms will start being decommissioned from 2028 and are expected to increase significantly from 2049 (AECOM, 2023). SA will be faced with the challenge of how to manage this waste.

Wind turbines are constructed primarily of metals, with reinforced concrete footings. These metal and concrete components represent up to 98% of the weight of a wind turbine, and are recyclable through existing pathways, however challenges exist in the extraction from site and transport. Wind turbine technology has evolved over time, with older models using a 'gearbox' made of easily recyclable steel, and new models using 'direct drive' technology incorporating permanent magnets. These new models are currently not recyclable, but given the high value of the rare-earth metals used in permanent magnets, the emergence of a market to recover and provide a secondary use for these materials is highly likely.

The most challenging part of a wind turbine to recycle is the blade, which varies between manufacturers, but is generally composites made up of a lightweight core (made of wood, polyvinyl chloride (PVC) or polyethylene terephthalate (PET) foam) coated in a polymer matrix (such as epoxy) with fibre reinforcement (glass or carbon fibres). Currently, there are no facilities in South Australia to address end-of-life wind turbine blades.

Product stewardship and supporting policy measures can improve circularity outcomes for wind turbines, including through redesigning for circularity and enabling material recovery and recycling.

Solar PV Systems

South Australia leads the nation on solar PV deployment, with 40% of free-standing homes being powered by solar (Department for Energy and Mining, n.d.), complemented by utility scale solar installations. By 2032, it is expected that 30,000 tonnes of solar PV will reach end-of-life per year, increasing to 50,000 tonnes per year in 2050, and 100,000 tonnes per year in 2064 (AECOM, 2023). As new, more efficient solar technologies come onto the market, many solar panels are being removed well before their intended 30-year life, generating waste ahead of time. This may be accelerated by subsidies available for both solar PV and household battery energy storage systems.

The solar PV recycling industry is in its early stages, with the most developed technologies found in Europe.

Valuable materials that can be recovered from solar PV systems include silicon, glass, silver, copper and aluminium (Webster, 2023). These materials are essential for manufacturing new renewable energy technologies, and domestic recovery of these will provide economic and resource security and further support the transition to net zero emissions and a circular economy. Nationally, the total recoverable material value from end-of-life solar PV systems is projected to surpass $1 billion by 2035 (Deng et al, 2024).

There are 2 common processing approaches for recycling solar PV panels – mechanical processing and pyrolysis – each with their own advantages and disadvantages. Further research is underway to improve recovery rates and commercial viability of both approaches, and to identify design options which can improve recycling outcomes. Solar PV recycling is available in Australia, but more capacity will be needed to manage the volume of waste being generated.

At the August 2025 Energy and Climate Change Ministerial Council, Ministers noted the importance of reusing the critical minerals within solar panels, and agreed that New South Wales will work with other states to develop a regulatory impact statement for mandated stewardship arrangements, and that the Australian Government will work with states to proof a national product stewardship scheme for solar PV systems (Department of Climate Change, Energy, the Environment and Water, 2025b).

Battery energy storage systems

South Australia has one of the highest uptakes of residential batteries in Australia and has 5 large-scale batteries in operation and one under construction (Department for Energy and Mining, n.d.). Battery energy storage systems are generally lithium ion (Li-ion), and face many of the same challenges and opportunities as smaller Li-ion batteries. As with both smaller batteries and other renewable energy technologies, decisions made at the planning and design stage can enable reuse and recycling opportunities at end-of-life.

ACTIONS TO ADDRESS EMERGING AND PROBLEMATIC WASTES				
	Action	Leads	Partners	Timing
Renewable energy technologies				
4.7	Consider policy mechanisms which would ensure all new grid-scale solar and wind turbine installations consider circular economy outcomes in project planning, and develop appropriate plans for end-of-life.	Department for Energy and Mining	Department of State Development Infrastructure SA Department for Environment and Water Environment Protection Authority Department for Housing and Urban Development State Planning Commission	Commencing 2026
4.8	Support the establishment of a national product stewardship regulatory scheme covering solar photovoltaic systems including battery energy storage systems.	Green Industries SA Environment Protection Authority		Ongoing

Batteries

The rapid growth of consumer electronics and electric vehicles has resulted in an increase in battery waste. Of the different battery chemistry types, Li-ion batteries are becoming increasingly common, with almost 10,000 tonnes of Li-ion battery waste expected to be generated in South Australia per year by 2035 [Cavanough & Tai, 2021]. Batteries include many valuable metals such as lithium and cobalt which can be recovered through recycling processes, and feed into production of new batteries [Chen & Ho, 2018].

While Li-ion batteries pose a high risk if poorly managed, they also present a significant opportunity if the valuable materials contained within the batteries can be recovered. The CSIRO estimates the lost value to Australia of not recovering the valuable metals and materials used in Li-ion batteries onshore to be between $4,400 and $17,200 per tonne, or up to $3.1 billion total [Zhao, Ruether, Bhatt, & Staines, 2021]. While the industry-led voluntary product stewardship scheme B-Cycle accepts some battery types, it achieved a collection rate of only 15.3% in 2023–24 [Battery Stewardship Council, 2024].

Li-ion batteries present a significant risk to waste management infrastructure with an estimated 10,000 fires per year in the waste management system nationally caused by Li-ion batteries [Australian Council of Recycling, 2024]. There is a need to keep batteries out of the general resource recovery and waste management system and direct them to appropriate alternative safe collection and recycling options. Safe disposal options are also required for batteries which are damaged or cannot be recycled.

At the December 2024 Environment Ministers Meeting, Ministers recognised the need to act quickly to reduce the risks of battery fires, and progress aligned state-led reforms for mandatory battery product stewardship [Department of Climate Change, Energy, the Environment and Water, 2024c]. Changes to battery design in both chemistry and construction can increase battery safety, enable reuse and refurbishment, and make disassembly for resource recovery at end-of-life easier [Wu, Kaden, & Dröder, 2023].

ACTIONS TO ADDRESS EMERGING AND PROBLEMATIC WASTES			
Action	**Leads**	**Partners**	**Timing**
Batteries			
4.9 Consider nationally aligned legislative reform to establish state-based mandatory product stewardship obligations for battery suppliers, prioritising battery types with the highest risk profile.	Green Industries SA Environment Protection Authority	New South Wales Environment Protection Authority	2025–2027
4.10 Contribute to the development of a national guideline for the safe transportation, storage, handling and disposal of waste lithium-ion batteries.	Environment Protection Authority	South Australian fire services	2025–2026
4.11 Until a product stewardship scheme is in place, as an interim measure, establish a safe and effective collection system for Li-ion batteries supported by a public awareness raising campaign.	Green Industries SA	Environment Protection Authority	2025–2027
4.12 Educate and raise community awareness of responsible and safe management of end-of-life batteries.	Green Industries SA	Metropolitan Fire Service	Ongoing
4.13 Progress legislative reform to prohibit the disposal to landfill of additional problematic batteries, including clarifying the status of lithium-ion batteries as prohibited from disposal to landfill and disposal through kerbside waste collection bins.	Environment Protection Authority		2025–2026
4.14 Identify pathways for safe destruction of damaged lithium-ion batteries where material recovery is not an option.	Green Industries SA Environment Protection Authority	Waste and resource recovery industry	2025–2027

E-Waste

E-waste is the fastest growing waste stream in the world, and Australia has one of the highest per-capita levels globally. Each year, around 20kg of e-waste is generated per person, which is expected to grow to almost 22kg per person by 2030 [Department of Climate Change, Energy, the Environment and Water, 2023e]. E-waste contains valuable materials such as gold, copper, nickel, silicon and lithium, which if recovered can feed back into electronics manufacturing and reduce the need to mine virgin resources. In 2023–24, South Australia recovered only 8.4kt of e-waste, which equates to just over 4kg per person [Green Industries SA, 2025].

Many electrical and electronic products also contain batteries, making e-waste a stream that faces many of the same safety issues as battery waste. Collection and recycling approaches for these waste streams may therefore be appropriate to address together.

While some e-waste is covered under product stewardship schemes, including the co-regulatory *National Television and Computer Recycling Scheme*, and the industry-led voluntary *Mobile Muster* scheme, this does not capture all products, and can be confusing for consumers. The Australian Government has committed to developing a product stewardship scheme for small electrical and electronic products.

Electronic cigarettes, also known as vapes, are a challenging e-waste stream. As well as electronic components and batteries, they also may still contain chemical residue at end-of-life, which can be problematic in the recycling process. Single-use vapes present a particular challenge, as the Australian Government banned their sale in 2024 [Therapeutic Goods Administration, 2024]. While this should limit the presence of these products in the waste stream over time, it creates additional challenges for their immediate and short-term management as regulated product stewardship schemes cannot apply to illegal products. Additionally, seized evidence needs to be destroyed under supervision and cannot be recycled.

ACTIONS TO ADDRESS EMERGING AND PROBLEMATIC WASTES				
	Action	Leads	Partners	Timing
E-waste				
4.15	Advocate for the inclusion of all consumer electronic products in a national regulated product stewardship scheme.	Green Industries SA Environment Protection Authority		Ongoing
4.16	Advocate for a national solution for the safe management of legally sold end-of-life vapes.	Green Industries SA Environment Protection Authority		Ongoing

Textiles

The global textile industry consumes 3.25 billion tonnes of materials each year, with more than 99% of this coming from virgin sources [Circle Economy Foundation, 2024]. While textiles are broader than just clothing, including furnishings, fit-outs and technical textiles, the challenges of clothing textiles in the areas of design, consumption and end-of-life management are particularly difficult to tackle.

In 2024, Australians purchased an average 55 new items of clothing per person, putting us as the equal highest fashion consumers in the world [Seamless, 2025] [Gbor & Chollet, 2024]. This level of consumption is unsustainable and is closely linked with a decrease in clothing quality that keeps manufacturing costs low, resulting in low prices that encourage high consumption. This lower quality clothing doesn't last as long and is less repairable, limiting its reuse potential. With few genuine recycling options available, much of it ends up in landfill. In 2023–24, the South Australian resource recovery rate for all textiles was only 24% [Green Industries SA, 2025].

While donating clothing to charity for reuse is a popular option, many clothes are too low quality to be worn again, placing a burden on charity shops to manage this waste stream. Changes are needed throughout the clothing life cycle, by designing and manufacturing clothing to be durable and recyclable, reusing and repairing it for as long as possible, and recycling it into new fibre at end-of-life.

Material choice impacts the sustainability and durability of the item and its recyclability at end-of-life, while construction techniques also have an impact on durability and repairability. These design choices enable, and are supported by, circular business models, for example rental, reuse, resale, subscriptions and on-demand manufacturing. Business models which focus on lower production quantities also support textile circularity, by slowing the flow of new clothing into the market.

Mechanical and chemical processing options for textile recycling exist, but use of recycled textiles fibres in new textiles (known as fibre-to-fibre) is not yet commercially available, requiring further work to develop and scale. Selecting recycled textiles at the design stage also supports fibre-to-fibre recycling.

Consumer behaviour underpins circularity throughout the clothing life cycle. Consumers can improve circularity by choosing to buy fewer clothes, buying second-hand, laundering in a way that extends clothing lifespan, repairing their clothes, and making responsible end-of-life choices through donating or recycling clothes appropriately.

The industry-led voluntary product stewardship scheme Seamless was established in 2024 to address these issues. The scheme aims to have 60% of clothing and retail brands operating in Australia as members by the end of 2025, rising to 80% by the end of 2027, and 100% by 2030 (Australian Fashion Council, 2024). Clothing textiles remained on the Minister's Priority List 2023–24 for product stewardship, signalling a willingness to regulate should there be insufficient industry support for Seamless (Department of Climate Change, Energy, the Environment and Water, 2023c).

Uniforms provide a convenient starting point to achieve many of the changes needed, as purchase, management and disposal decisions are far more centralised than in the wider fashion sector. Uniform procurement and recycling strategies can send a market signal to encourage investment in this area.

ACTIONS TO ADDRESS EMERGING AND PROBLEMATIC WASTES				
	Action	Leads	Partners	Timing
Textiles				
4.17	Support circular clothing business models to extend the life of clothing, including rental, reuse and resale, subscriptions, and on-demand manufacturing.	Green Industries SA	Charitable reuse sector Australian Fashion Council SA Fashion Industry Association	Ongoing
4.18	Support textile stewardship schemes, such as Clothing Stewardship Australia's *Seamless*, through policy, programs and infrastructure investment in circular systems for textiles.	Green Industries SA	Clothing Stewardship Australia	Ongoing
4.19	Encourage behaviour change through citizen education on sustainable clothing consumption, buying better, caring for clothes, reuse, donation and appropriate disposal of unwearable clothing.	Green Industries SA		Ongoing
4.20	Encourage and support the procurement of government uniforms that are designed for durability, reuse, repair and recyclability, and manage government uniforms in line with the waste management hierarchy.	Green Industries SA Local Government Association of South Australia	State government departments and agencies Local government Department of Treasury and Finance	Ongoing
4.21	Encourage research and development into circular textile solutions, including textile recycling and fibre-to-fibre technologies.	Green Industries SA		Ongoing

CCA treated timber

Copper chromated arsenate (CCA) is Australia's most widely used wood preservative to protect timber from insects, pests and microbes, as well as provide resistance to the weather. CCA treated timber (commonly known as 'permapine') is used in many industries, including viticulture, horticulture, agriculture and aquaculture, as well as landscaping and construction (as frame and truss timber).

While contamination risks are low when in use, inappropriate management of CCA treated timber at end-of-life can lead to environmental and human health impacts. When burned, either deliberately or in a bushfire, CCA treated timber releases 11% to 14% of the total arsenic content into the atmosphere, with the remaining arsenic found in the residual ash. This arsenic is bioavailable and toxic to humans, making fires a significant risk due to the toxic ash left behind.

In the South Australian wine industry, a conservative estimate of 700,000 CCA treated timber posts (5.9kt) are removed annually, based on an attrition rate of 2% (Mitchell et al, 2024). This accounts for 57% of vineyard posts removed nationwide. In addition, contraction of the wine industry is expected to result in additional vineyard removals of an estimated 2.4 million posts (19.7kt).

An estimated 76% of removed vineyard posts in South Australia are stockpiled on site (Mitchell, Strandgard, & Singh, 2024). The EPA provides guidance on the on-site management of CCA treated timber waste. CCA treated timber can only be disposed of at a limited number of engineered, lined landfill sites in SA, but gate fees and transport costs make this a cost-prohibitive option for many businesses.

Research into recycling technologies for CCA treated timber continues to be an area of interest, however there is currently no commercially available recycling for end-of-life CCA treated timber in Australia. Possible recycling technologies include metal extraction, carbon recovery, energy recovery and fibre recovery. Re-use options are generally small scale and include fence posts, landscape timber, parking lot bumpers, guardrail posts, planter boxes, shipping crates and walkway edging.

A range of alternatives to CCA treated timber exist, including alternative wood preservation treatments which are less problematic to recycle, as well as alternative materials which can serve the same functional purpose. Many of these are more expensive than CCA treated timber, but a recent study found that when whole-of-life costs were considered, steel vineyard posts can be less expensive than CCA treated timber over a 30-year period [Axio, et al., 2023].

With the announcement in March 2025 of $800,000 in funding from the South Australian and Australian governments, work is commencing to find solutions to better manage growing stockpiles of CCA treated timber. The Treated Timber Product Stewardship Working Group, consisting of members of the wine and forest industries, environment specialists and universities, will develop a new national stewardship framework to address the reuse, recovery, management and safe disposal of CCA treated timber. This work will have application for the aquaculture industry, and potentially other industries, in the future.

ACTIONS TO ADDRESS EMERGING AND PROBLEMATIC WASTES				
	Action	Leads	Partners	Timing
CCA treated timber				
4.22	Work with other jurisdictions to explore national options to phase out the use of CCA treated timber for particular applications.	Environment Protection Authority		2025–2030
4.23	Support the development of: • innovative and commercially viable reuse and recycling solutions for end-of-life CCA treated timber to prevent environmental harm • non-toxic alternatives to CCA treated timber products.	Green Industries SA Department of Primary Industries and Regions	South Australian Wine Industry Association South Australian Forest Products Association Environment Protection Authority Department of State Development Wine Australia	2025–2027
4.24	Support the development of an industry-led product stewardship scheme for CCA treated timber that includes addressing sustainable end-of-life management of and circular opportunities for new and legacy waste.	Department of Primary Industries and Regions	South Australian Wine Industry Association Treated Timber Product Stewardship Working Group Green Industries SA Environment Protection Authority Department of State Development Wine Australia	2025–2027

Chemicals of concern and hazardous waste

Chemicals of concern and hazardous waste are problematic in a circular economy, as products containing hazardous materials are not readily or safely able to be recirculated in the economy. Where possible, chemicals of concern should be designed out of products and prevented from entering the economy. Until then, there will continue to be a need for these wastes to be managed safely and effectively. This includes providing solutions that enable households to dispose of hazardous waste in a safe and convenient way and ensuring that chemicals of concern are appropriately considered in EPA decision making.

Persistent organic pollutants (POPs) are toxic chemicals which remain in the environment for a long time, are accumulated in food chains, and can cause harm to human health and the environment. These include per- and polyfluoroalkyl substances (PFAS), hexachlorobenzenes (HCBs), organochlorine pesticides (OCPs) and polychlorinated biphenyls (PCBs). Many of these chemicals have been or are being phased out of production and use through the Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention, 2024). Under the *Environment Protection (Waste to Resources) Policy 2010*, the EPA must have regard to the national environmental management plans (NEMPs) for these chemicals when determining matters in relation to environmental authorisations and development authorisations.

An updated PFAS NEMP was published in early 2025. The updated plan complements the standards established under the *Industrial Chemicals Environmental Management Standard*, which bans, severely restricts, or reduces the environmental impact of three types of PFAS along with over 500 related substances from 1 July 2025 (Department of Climate Change, Energy, the Environment and Water, 2024c).

ACTIONS TO ADDRESS EMERGING AND PROBLEMATIC WASTES				
	Action	**Leads**	**Partners**	**Timing**
Chemicals of concern and hazardous waste				
4.25	Support and advocate for measures that require chemicals of concern and hazardous substances, including PFAS, to be designed out of products.	Green Industries SA Environment Protection Authority		Ongoing
4.26	Progress amending the *Environment Protection (Waste to Resources) Policy 2010* to require that additional contaminants and chemicals of concern added to national or international agreements, such as the National Strategy for the Management of Scheduled Wastes, be considered as part of EPA decisions relating to environmental and development authorisations.	Environment Protection Authority		2025–2027
4.27	Support the implementation of the *PFAS National Environmental Management Plan* and support actions to update relevant standards to manage PFAS and other chemicals of concern, including emerging.	Environment Protection Authority		2025–2030
4.28	Explore and implement suitable solutions to expand options for households to conveniently dispose of hazardous waste.	Green Industries SA	Local government Product stewardship scheme administrators Waste and resource recovery industry (service providers and host sites)	Ongoing

Focus area 5: Develop and support circular markets and businesses

This focus area directly supports the overarching goal of this strategy to double SA's circularity rate by 2035. Circularity rate measures how much of the total amount of materials consumed within an economy are secondary materials, and therefore relies on these materials being used in the market in place of virgin resources.

Developing strong markets for recycled materials and circular businesses drives demand for recycling operations and supports their commercial sustainability. It also supports business investment in researching and developing new products, as well as expanding processing and production capacity and the introduction of new products and services to the market through diversification of business models. In addition to the priorities identified below, market development can also be supported by effective product stewardship schemes.

Priorities

Procurement

Public procurement is an influential market driver, with governments around the world leveraging their significant buying power to deliver on environmental commitments, drive innovation for sustainable products, and reduce the environmental impact associated with their spending. Procurement plays a pivotal role in creating and increasing market demand for recycled content, and for circular products and services. Governments can also set an example for the private sector to follow by demonstrating leadership in sustainable procurement practices.

The South Australian Government's $8.5 billion annual procurement spend can be leveraged in the same way. This has been recognised nationally in *Australia's Circular Economy Framework*, *The Circular Advantage* [the final report of the federal Circular Economy Ministerial Advisory Group], and the *2024 National Waste Policy Action Plan*. The 2023 *South Australian Economic Statement* also recognises the importance of sustainable procurement as a lever to influence change and achieve sustainable outcomes [Government of South Australia, 2023].

The South Australian Department for Infrastructure and Transport introduced a sustainable procurement policy in 2023 to ensure sustainability risks and opportunities are identified and addressed through the procurement process [Department for Infrastructure and Transport, n.d.]. While this is important progress, a whole-of-government approach is needed to send a strong market signal.

Local governments are also significant procurers of material, with an annual expenditure of nearly $1 billion each year across South Australia on goods, buildings and works [Local Government Association SA, n.d.]. Local government has a specific financial interest in the development of end markets for recyclable materials collected through kerbside bins, as they and their communities bear the costs for managing this waste stream.

Regardless of the organisation seeking to implement sustainable procurement, support will be needed for procurement officers. This includes specific training, procurement resources such as sample evaluation questions and contract clauses, and ongoing support.

Increasing use of recycled content

Recycled materials compete against virgin materials and face a range of barriers, including cost, quality, performance and longevity. Addressing these will require a range of interventions, including information sharing, verification of claims, and measures to level the playing field between virgin and recycled content. Shifting the way recycled materials are viewed, from being a waste to being a resource, can change the perception of barriers and promote increased use of recycled materials. Where possible, preference should be given to the use of locally recycled materials over imported recycled materials, to support local recycling markets. To enable the continued circularity of materials, products manufactured using recycled content should also be designed to be recyclable.

Traceability is an approach which tracks a product through the supply chain, from the original input all the way through to use and then end-of-life. For recycled content products, traceability offers a way to track and verify the source of the material, the processes used on it, the percentage of recycled content included, and any certifications held. This helps purchasers make informed decisions about what they are buying and can minimise concerns over quality or risk.

Innovation

Innovation is needed to support and drive all aspects of the circular economy transition. This includes:

- designing for circular outcomes
- developing new ways to recover valuable materials from end-of-life products and to use these recycled materials in new products
- finding new markets or value chains for products before they become waste (for example valorising food waste for human consumption)
- developing circular business and value creation models
- developing digital technologies
- systems optimisation

Support is needed across all stages of development, from early-stage innovation to commercialisation and ongoing improvement. Innovation doesn't just happen in universities and research institutions but can be achieved through collaboration between businesses and industries to find new ways of doing things.

Circular businesses

The business sector is essential to the transition to a circular economy, as this is the point at which many of the critical design and production decisions are made. The benefits to businesses in becoming more circular are not just environmental, but can include new market opportunities, increased resilience and supply chain security, reduced operating costs, and employee attraction and retention. Lean manufacturing improves resource efficiency, which can increase productivity and reduce business costs. Businesses can also explore alternate value creation models that are in line with a circular economy, such as through *ISO 59010:2024: Circular economy — Guidance on the transition of business models and value networks*.

Collaboration with other businesses can also provide opportunities to increase circularity, whether this be in their purchasing practices in their supply chain, or as part of a circular precinct or ecosystem where waste from one business becomes a resource for another, creating closed loops of material and energy flow. Through collaboration, businesses can work together to reduce waste, maximise resource use and material productivity, and create value in a sustainable way.

Just like there is no one type of business, there is no single approach for businesses to become more circular. Small to medium businesses in particular need support to make these changes, through practical and tailored assistance to capitalise on circular opportunities, and investment which supports high circularity outcomes.

Objectives

- Reduce the use of virgin resources through increasing material productivity
- Maximise resource efficiency in production and consumption through using recycled materials, minimising the generation of waste and preventing the release of hazardous substances throughout the life cycle of products and materials
- Increase end markets for recovered resources
- Prioritise recycled content products and materials in procurement processes
- Boost economic growth and generate more circular economy businesses and jobs

ACTIONS TO DEVELOP AND SUPPORT CIRCULAR MARKETS AND BUSINESSES			
Action	**Leads**	**Partners**	**Timing**
Expand environmentally sustainable procurement practices			
5.1[6] Develop and implement a South Australian whole-of-government approach to environmentally sustainable public procurement, within the SA Government Procurement Framework, that aims to improve environmental sustainability across the key areas of climate, the environment and circularity.	Department of Treasury and Finance	Green Industries SA Department for Environment and Water	2025 – ongoing
5.2 Encourage the development and implementation of environmentally sustainable procurement policies and practices (including internal measurement and reporting against performance indicators) across local government. Consider alignment and collaboration opportunities between local governments.	Local Government Association of SA Green Industries SA	Local government	Ongoing
5.3 Encourage and support South Australian businesses to adopt and implement ESG and environmentally sustainable procurement policies and practices, including through education and awareness raising.	Green Industries SA	SA Business Chamber	Ongoing
5.4 Support the implementation of environmentally sustainable procurement in state and local government through education, awareness raising, addressing barriers and sharing of knowledge.	Green Industries SA Local Government Association of SA	State government departments and agencies Local government Department of Treasury and Finance	Ongoing
Support research and innovation			
5.5 Encourage and support research and innovation that supports circular economy outcomes through technologies, circular business models and circular design and production.	Green Industries SA	Department of State Development Circular Australia Cooperative Research Centres Commonwealth Scientific and Industrial Research Organisation Universities	Ongoing
5.6 Foster innovation and encourage collaboration among businesses and organisations, for example through industrial symbiosis or circular ecosystems, that: • enables shared resource use • improves value chains • creates closed loops of resource use and waste management • creates new markets for recycled materials.	Green Industries SA	Department of State Development SA ZERO Department of the Premier and Cabinet Industry associations	Ongoing

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6   Action 5.1 is aligned with Action 5.2 of the *South Australian Government Climate Change Resilience and Adaptation Actions*, and Action 4.1 of the *Climate Ready Government Net Zero Emissions for Government Operations Program*.

ACTIONS TO DEVELOP AND SUPPORT CIRCULAR MARKETS AND BUSINESSES				
	Action	Leads	Partners	Timing
Grow circular businesses				
5.7	Support implementation of the National Framework for Recycled Content Traceability to boost business confidence in, and demand for, recycled content by increasing the amount of information available on these materials and to reinforce circular practices across the supply chain.	Green Industries SA	Australian Government	Ongoing
5.8	Advocate for the development of national policy mechanisms that enable and encourage the use of domestic recycled materials in place of virgin inputs.	Green Industries SA		Ongoing
5.9	Consider measures, including consideration of legislative or economic levers, that provide a level playing field for businesses with circular business models and support local market development for remanufactured products.	Green Industries SA	Environment Protection Authority	2025–2030
5.10	Invest in activities that achieve high circularity outcomes, support market development for circular products and services, and the establishment of circular precincts.	Green Industries SA Department of State Development	Australian Government Department of the Premier and Cabinet	Ongoing
5.11	Identify and support priority industries and sectors that require assistance to improve sustainability and circular outcomes, and increase market uptake.	Green Industries SA	SA Business Chamber SA Regional Development Australia Committees	2025–2028
5.12	Encourage and support South Australian businesses to increase material productivity by adopting lean manufacturing and resource efficiency practices and embedding circular principles and practices in business operations.	Green Industries SA	SA Business Chamber Australian Industry Group	Ongoing
5.13	Encourage South Australian businesses to transition their value creation models and networks from a linear to a circular framework through adopting *ISO 59010:2024 Circular economy — Guidance on the transition of business models and value networks*.	Green Industries SA	SA Business Chamber	Ongoing

Focus area 6: Build a circular built environment

The built environment is responsible for nearly 40% of the world's raw material use and 38% of global energy-related emissions [Valentini, 2023] [NABERS, n.d.]. As operational emissions decline as a result of grid decarbonisation, embodied carbon is on track to be the largest source of emissions in the building sector. In 2023, embodied carbon from building activity contributed 10% of national carbon emissions [Infrastructure Australia, 2024]. In addition to reducing emissions, a circular built environment must also be climate resilient.

Transformation in the built environment is critical to the transition to a circular economy, with the sector identified in *Australia's Circular Economy Framework* as one of 4 priority areas [Department of Climate Change, Energy, the Environment and Water, 2024e]. In the Greater Adelaide region alone, over the next 25 years an estimated additional 315,000 homes will be needed, meaning the design and construction choices made today will determine the environmental and social impacts of the sector for decades to come [State Planning Commission, 2025].

The *Circular economy in South Australia's built environment – Action Plan* [2023], developed by the Green Building Council of Australia, identifies the actions needed to develop a circular economy in the South Australian built environment. These cover planning, designing, construction, operation, renovation and end-of-life, and providing the sector with a clear plan for the transition [Green Building Council of Australia, 2023].


PLAN & DESIGN FOR
- Climate resilience
- Avoidance
- Flexibility / adaptability
- Modularity
- Low emission / sustainable materials
- Durability / longevity
- Reduced extractive materials
- Locally sourced materials
- Disassembly / reuse
- Efficiency
- Reuse
- Regenerative environments

MANUFACTURE
- Durable, repairable and recyclable materials and products
- Locally made / assembled
- Sharing material inputs / outputs
- Remanufacture recovered materials and products
- Prioritise accredited products
- Service based options

REUSE & RECYCLE
- To enable remanufacturing, repurposing and recycling
- Deconstruct and reuse
- To minimise waste and energy recovery
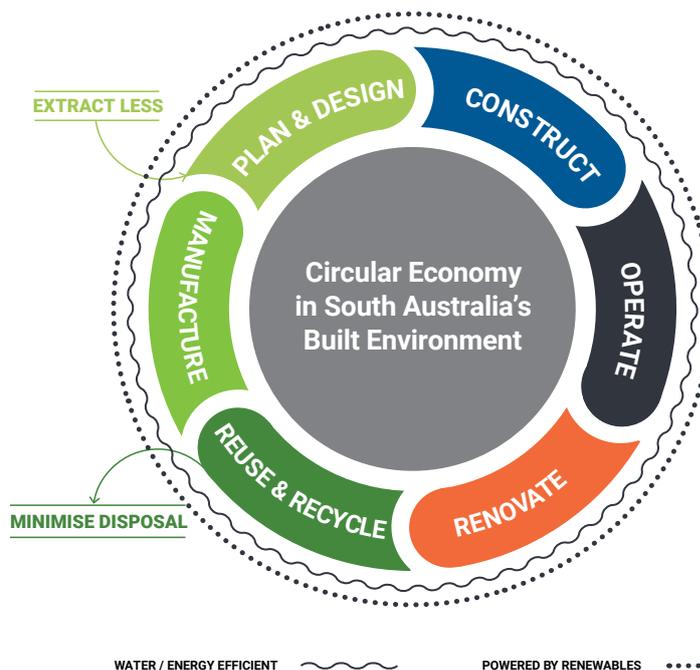
CONSTRUCT
- Powered by renewables
- With low emission materials
- Using locally sourced materials & prefabrication
- Recovering and salvaging materials for reuse, remanufacturing and recycling

OPERATE
- Conserve energy / water and reduce fossil fuel use / dependence
- Share resources
- Reuse, repair & refurbish
- Maintain longevity
- Reduce emissions
- Track materials and reuse

RENOVATE
- To extend asset life
- To address under-utilisation
- Improve performance
- Reimagine spaces
- Celebrate heritage

EXTRACT LESS

MINIMISE DISPOSAL

Circular Economy in South Australia's Built Environment

PLAN & DESIGN / CONSTRUCT / OPERATE / RENOVATE / REUSE & RECYCLE / MANUFACTURE

WATER / ENERGY EFFICIENT   POWERED BY RENEWABLES

SA's planning system has a key role to play in driving a transition to a circular economy and net zero emissions in the built environment, through urban planning, development approvals, zoning laws and land releases, while meeting the housing and infrastructure needs of current and future South Australians.

The government recognises the intersections between addressing climate change and reducing waste from our building and construction industry by promoting circular economy principles. The government has committed to exploring how the planning system can advance the circular economy, alongside waste treatment and management policies that consider climate change and urban infill scenarios.

A shift is required to the way buildings and infrastructure are designed, to focus on longevity, reduce the need for raw materials, ensure buildings can be adapted to meet future needs, and enable disassembly, reuse and recycling at end-of-life. Refurbishment and adaptive reuse are approaches that maintain existing buildings and infrastructure assets for longer and enable building use to change over time, reducing the environmental impacts of demolition and rebuilding. While these can be applied to the existing building stock to minimise the need for new construction, new buildings can also be designed and constructed to enable adaptive reuse in the future.

The Australian Government's *Net Zero – Built Environment Sector Plan* recognises that using material resources more efficiently, and encouraging the use of low emissions products, is an important method for reducing emissions across all sectors. The plan identifies the following circular economy strategies as pathways to reduce emissions:

- Prioritising refurbishment and adaptive re-use over demolition

- Designing for modularity and disassembly

- Designing for longevity

- Inclusion of recycled content and diversion of waste from landfill

- Using waste heat from one facility, such as a data centre, to heat another, such as an office or swimming pool

[Treasury and Department of Climate Change, Energy, the Environment and Water, 2025]

Approaches such as modularity, standardisation and off-site prefabrication reduce material use while achieving the same structural outcomes, as can designing in a way which reduces high embodied carbon materials such as concrete and steel. Reductions in embodied carbon can be achieved by using recycled content, green steel, low carbon concrete, and reusing materials and products. Guidelines, standards, specifications and tools are needed around these new materials to ensure their engineering properties are well understood, and their environmental benefits can be measured.

Design stage decisions affect end-of-life, including to enable disassembly, reuse and recycling of the materials and products. By selecting materials, components and construction approaches with these objectives in mind, it can be ensured that the materials used in the built environment can continue to circulate through the economy. Product stewardship schemes for manufactured products used in construction and office fit-outs can improve circularity outcomes for these products, by embedding manufacturer and supplier responsibility for these products throughout their lifespan.

Many of the decisions that influence the circularity of a building are made as part of the procurement process. *A practical guide to circular procurement for new buildings and major refurbishments*, developed by the Green Building Council of Australia, provides clear steps for embedding circular strategies into procurement practices [Green Building Council of Australia, 2025].

Regenerative design, an approach that aims to have a positive environmental and social impact on the site, surrounding environment, and natural ecosystem, directly aligns with a circular economy approach by reducing the extraction of resources. It goes beyond simply mitigating climate change and reducing impacts, to having a net positive impact on the environment.

Specialised skills are needed to drive a circular built environment across a wide range of fields including engineering, design and architecture, planning, and construction. These skills will need to be integrated into existing courses across the tertiary education sector, and professional training will be required to upskill existing working and skilled professionals in these fields.

- Circular outcomes are supported and enabled by planning and development legislation and policies
- Demand for raw materials is reduced through a reduction in material footprint of the built environment
- Less waste is generated through:
  - » improving the design of buildings and infrastructure including designing out waste, and designing for disassembly and reuse
  - » adaptive reuse of space and materials
- Built environment industry and workforce further develop circular economy knowledge and skills

ACTIONS TO BUILD A CIRCULAR BUILT ENVIRONMENT				
	Action	Leads	Partners	Timing
6.1	Support, promote and implement circular economy principles in urban planning, infrastructure and development projects.	Green Industries SA Office for Design and Architecture SA Renewal SA Department for Infrastructure and Transport Infrastructure SA Local government	Department for Housing and Urban Development	Ongoing
6.2	Develop guidelines for 'design of the built environment' practices and the adoption of sustainable and climate resilient building materials.	Green Industries SA Department for Housing and Urban Development Office for Design and Architecture SA	Department for Infrastructure and Transport Adelaide Sustainable Building Network Green Building Council of Australia Materials and Embodied Carbon Leaders' Alliance Australian Sustainable Built Environment Council	2025–2030
6.3[7]	Develop and implement shared approaches and minimum standards between government agencies for lower embodied carbon and sustainable materials in buildings and development sites that are occupied, designed, constructed, and/or sold by the South Australian Government.	Green Industries SA Department for Infrastructure and Transport	Office for Design and Architecture SA Department for Housing and Urban Development Renewal SA	2025–2030

[7] Action 6.3 is aligned with Action 2.1 of the *Climate Ready Government Net Zero Emissions for Government Operations Program*.

ACTIONS TO BUILD A CIRCULAR BUILT ENVIRONMENT				
	Action	Leads	Partners	Timing
6.4	Support national efforts to develop standards and specifications for the use of recycled content in capital works projects.	Green Industries SA	Australian Government Department for Housing and Urban Development Renewal SA Department for Infrastructure and Transport Office for Design and Architecture SA Materials and Embodied Carbon Leaders' Alliance Australian Sustainable Built Environment Council	Ongoing
6.5	Investigate opportunities for: • increased uptake of sustainable building material components and processes in construction (such as Modern Methods of Construction) • adaptive reuse and retrofitting of existing building stock • improved processes during refurbishments to support increased resource recovery and material reuse • better salvaging and reuse of building materials through deconstruction and disassembly • the establishment of building material banks to facilitate material reuse • supply chain engagement to identify circular economy opportunities.	Green Industries SA	Department for Housing and Urban Development Department for Infrastructure and Transport Renewal SA Office for Design and Architecture SA Adelaide Sustainable Building Network Green Building Council of Australia Materials and Embodied Carbon Leaders' Alliance Australian Sustainable Built Environment Council	Ongoing
6.6	Establish a cross-government working group to identify and progress government-led actions to support implementation of recommendations in the *Circular economy in SA's built environment Action Plan 2023*.	Green Industries SA	State government departments and agencies	2026–2030
6.7[8]	Provide an appropriate supply of land for waste and resource recovery facilities and other circular industries, including building material banks, by maintaining a rolling 15-year supply of employment land to maximise resource use, support economic growth and service our communities.	Department for Housing and Urban Development		Ongoing

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8   Action 6.7 is aligned to long-term strategic objective 1 in the Waste and resource recovery section of the *Greater Adelaide Regional Plan*.

ACTIONS TO BUILD A CIRCULAR BUILT ENVIRONMENT				
	Action	Leads	Partners	Timing
6.8[9]	Facilitate coordinated land use and infrastructure planning and decision making by incorporating capacity mapping and forward work plans of state infrastructure agencies and utility providers in the Land Supply Dashboard.	Department for Housing and Urban Development		2025–2028
6.9[10]	Work with key industry partners and different tiers of government to develop resources that will inform and foster regenerative approaches to land use planning.	Department for Housing and Urban Development		2025–2028
Skills and knowledge				
6.10	Embed circular economy principles into tertiary education courses, vocational education and training and industry training programs to ensure built environment disciplines are considering circularity and embodied carbon/ emissions.	Department of State Development South Australian Skills Commission Office for Design and Architecture SA Universities TAFE SA	Department for Education South Australian Skills Commission's Industry Skills Councils Department for Energy and Mining Registered training providers Industry bodies and associations	2025–2030
Legislative and policy enablers				
6.11	Investigate and identify legislative and/or policy options to support circular outcomes in housing, planning and urban development, including consideration of South Australian planning instruments.	Green Industries SA	State Planning Commission Department for Housing and Urban Development Infrastructure SA Office for Design and Architecture SA Local Government Association of SA	2025–2026
6.12[11]	Consider embedding circular economy principles, provisions and measures in South Australian planning instruments to support the SA government's commitment to transition to a circular economy.	State Planning Commission Department for Housing and Urban Development	Green Industries SA Office for Design and Architecture SA Infrastructure SA	2027–2030
6.13[12]	Investigate opportunities to provide flexible planning polices to encourage and enable adaptive reuse of existing buildings, in particular heritage places, to create vibrant communities and liveable places.	Department for Housing and Urban Development		2025–2030

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9   Action 6.8 is aligned to actions in the Coordination and delivery section of the *Greater Adelaide Regional Plan*.

10   Action 6.9 is aligned with the action in the Climate change section of the *Greater Adelaide Regional Plan*.

11   Action 6.12 is aligned with long-term strategic objective 5 in the Waste and resource recovery section of the *Greater Adelaide Regional Plan*.

12   Action 6.13 is aligned with long-term strategic objective 4 in the Waste and resource recovery section, and long-term strategic objective 4 in the State and local heritage section of the *Greater Adelaide Regional Plan*.

Focus area 7: Develop circular economy knowledge and skills

Transitioning to a circular economy requires a shift across society. It's important that a shared understanding of why a circular economy is essential for a sustainable future is developed, as well as how we're going to get there, and continue to develop the knowledge and skills needed to participate in and build this future.

Community education and awareness raising for individuals, households and businesses builds understanding of how a circular economy works. This can include providing direct information to households on how to use kerbside bins correctly, encouraging circular consumption practices around re-use and repair, and providing the information needed to make purchasing decisions which support a circular economy. It also creates norms of circular economy thinking and builds these values in the community.

KPMG estimates that a circular economy will create an additional 17,000 FTE jobs in Australia by 2047–48, compared to a business-as-usual scenario (KPMG, 2020). Re-skilling and up-skilling of the existing workforce is also essential, as most of Australia's workforce for the next 10 to 20 years is already employed (Department of Climate Change, Energy, the Environment and Water, 2024b). This skills gap can be more pronounced in regional areas due to smaller populations and limited access to TAFE or vocational education.

To enable the workforce to meet this demand, training and education will be needed. A workforce skills gap analysis will also be needed to ensure the training programs and educational pathways developed match the current and future needs of SA's circular economy. Some of the skills that will be needed include:

- digital skills – data analysis, digital modelling, and smart manufacturing

- green skills – environmental management, sustainable resource management, renewable energy technologies, waste management, and resource recovery

- repair skills – repair and maintenance of a range of product types

- built environment skills – urban planning, architecture and design, engineering, and construction

- industrial design skills – to (re)design and manufacture circular products

- soft skills – problem solving, critical thinking, collaboration and innovation

- business, economics and management skills – supply chain management, reverse logistics, procurement, circular business models and sustainable finance.

Circular economy knowledge and skills need to be incorporated into appropriate education and training programs, including schools, universities, vocational education and industry training. Professional development through short, focused micro-credentials can provide individuals with specific skills and knowledge, allowing them to respond to evolving job markets in the circular economy transition. Policy makers, community leaders and businesses are key targets for this up-skilling, to help shift their thinking and practices towards circularity.

Objectives

- Increase knowledge about the circular economy and develop circular mindsets

- Develop a skilled and educated workforce for new circular economy jobs, circular businesses and a circular built environment

- Increase awareness about sustainability and the circular economy to influence and foster long-term cultural and behavioural change

- Create resilient and sustainable businesses and a more resilient and sustainable economy

ACTIONS TO DEVELOP CIRCULAR ECONOMY KNOWLEDGE AND SKILLS			
	Action	**Leads**	**Partners**	**Timing**
Community education and awareness				
7.1	Having regard to national harmonisation efforts, provide coordinated and centralised recycling and waste avoidance education and awareness information to reduce the amount of waste generated, increase resource recovery, maximise the economic value of resources and reduce confusion.	Green Industries SA		Ongoing
7.2	Deliver information to council-serviced premises on reducing waste and the correct use of kerbside recycling and organics bins, as well as other collection systems.	Green Industries SA	Local government	Ongoing
7.3	Advocate for national product labelling standards and systems that: • retain information throughout the product life cycle (such as product traceability) • disclose materials used including, but not limited to, recycled content • provide information to enable repair, reuse, disassembly and recycling of products.	Green Industries SA		2025–2030
Education and skills development				
7.4	Engage policy makers, community leaders and businesses on strategies to incorporate circularity thinking into their practices and encourage a shift towards a circularity mindset. Support and recognise the emergence of circular economy champions across policy, industry and community sectors.	Green Industries SA	SA Business Chamber State government departments and agencies Local government Business leader networks SA Regional Development Australia Committees Professional bodies	Ongoing
7.5	Share knowledge about circular economy activities, including information on circular business models and case studies on circular businesses and products.	Green Industries SA		Ongoing
7.6	Identify workforce skills gaps that need to be filled to support the transition to a circular economy and develop skills and training programs to address these.	Department of State Development South Australian Skills Commission	South Australian Skills Commission's Industry Skills Councils TAFE SA	2025–2030
7.7	Expand circular economy education, training and skills development, for example through circular economy vocational training centres, integrating circular economy into tertiary curricula and linking circular economy principles to secondary curricula.	Department for Education South Australian Skills Commission Department of State Development Tertiary education sector Vocational training sector TAFE SA	South Australian Skills Commission's Industry Skills Councils Commonwealth Jobs and Skill Councils	Ongoing
7.8	Offer 'common core' courses to tertiary students that incorporate circular economy knowledge and skills, providing opportunities to study interdisciplinary issues.	Universities		Ongoing

Focus area 8: Measure our transition to a circular economy

Data is key to helping South Australia accelerate our transition to a circular economy.

Collecting data against key indicators (particularly the strategy's targets and goals) tells us where South Australia is progressing well and helps to identify the areas where attention is required in terms of programs and investment, policy reform, behaviour change or education.

GISA reports against waste strategy targets and goals annually. Most recently this has been done through the annual publication of a Circular Economy and Resource Recovery Report, which also reports on recovery rate by material stream, environmental and economic benefits of recycling, and jobs creation. With new circular economy metrics being used for the first time in this strategy, there is an obligation to measure against these and report progress.

For the new goals relating to material circularity and circular consumption activities, work has begun to determine what will be measured, select methodologies, establish baselines and commence monitoring before reporting commences. Limitations may include the availability of data, and funding for the collection of additional data. Addressing data gaps relating to material flows and end fates, through EPA mass balance data, would provide additional important information to enable a fuller understanding of material circularity.

Ensuring consistency in data collection and reporting through standardising methodologies and harmonising data classifications across all levels of government, provides our collective data with rigor and enables comparison of results across local government, as well as states and territories.

Objectives

- Collect comprehensive and timely data to support better consumer, investment and policy decisions
- Continually improve how we measure, collect and report on progress towards a circular economy

ACTIONS TO MEASURE OUR TRANSITION TO A CIRCULAR ECONOMY				
	Action	Leads	Partners	Timing
Continually improve how we measure, collect and report				
8.1	Develop a comprehensive circular economy monitoring framework to measure and report on progress against the strategy's goals and targets, South Australia's circular economy transition, and help inform circular economy strategies, policies and programs.	Green Industries SA		2025–2027
8.2	Support alignment with national standards for harmonised data classifications, definitions and reporting, including alignment with *Australia's Circular Economy Framework*.	Green Industries SA	Australian Government	Ongoing
8.3	Consider reforms to improve EPA waste data relating to material flows and end fates, to increase transparency and inform evidence-based policy, regulation and targets relating to specific materials.	Environment Protection Authority	Green Industries SA	2025–2030

ACTIONS TO MEASURE OUR TRANSITION TO A CIRCULAR ECONOMY			
Action	**Leads**	**Partners**	**Timing**
8.4 Consider options for a more streamlined approach to data reporting and sharing by local government to state government, and between state government agencies, on household waste generation and resource recovery performance, to provide accurate and timely circular economy metrics for all levels of government.	Green Industries SA Environment Protection Authority	Local Government Association of SA Local Government Grants Commission	2025–2028
8.5 Consider standardisation of kerbside waste collection bin audit methodologies to ensure consistency and enable comparison of results across councils.	Green Industries SA Environment Protection Authority	Local government	2025–2026

Focus area 9: Contribute to net zero emissions

South Australia has been a world leader in adopting renewable energy on our journey to a net zero future. While this clean energy transition is critical to cutting our GHG emissions, so is the transition to a circular economy as 55% of global GHG emissions can be attributed to the extraction and processing of materials (United Nations Environment Programme, 2024a). Transforming the way products and food are designed, produced and used can significantly reduce emissions and contribute to SA's commitment to net zero emissions by 2050.

Food waste that is disposed to landfill is responsible for 3% of Australia's emissions annually, so actions that prevent food and other organic waste from being disposed to landfill contribute to reducing GHG emissions. Approximately 730kt of CO_2 equivalent was emitted from South Australian waste disposal sites in 2023 (Department of Climate Change, Energy, the Environment and Water, n.d.). The use of landfill gas capture management systems to capture and burn landfill gases, also contributes to reducing emissions to the atmosphere.

Regenerative agricultural practices can increase soil carbon, which helps to sequester atmospheric carbon dioxide while replenishing nutrient stocks and creating healthy soils.

While the actions listed below contribute directly to achieving net zero emissions, actions listed in other focus areas also contribute to reducing our GHG emissions through enabling and supporting our transition to a circular economy.

It is worth noting that with the commencement of the Australian Sustainability Reporting Standards mandatory reporting in January 2025, certain businesses and financial institutions will need to prepare and report on their climate and sustainability-related risks and opportunities in the next 5 years and beyond. These new reporting requirements will focus attention on supply chains and may have an impact on different waste streams and recovered resources.

Objectives

Contribute to a reduction in GHG emissions through:

- reducing the generation of waste
- reducing unnecessary production and consumption
- reducing demand to extract virgin resources by keeping materials circulating within the economy as long as possible and at their highest value use
- increasing material productivity
- avoiding sending organic waste to landfill
- maximising the capture of GHG at landfills

ACTIONS TO CONTRIBUTE TO NET ZERO EMISSIONS				
	Action	**Leads**	**Partners**	**Timing**
9.1	Consider legislative measures to provide for consideration of greenhouse gas emissions in regulatory decisions relating to waste and resource recovery.	Environment Protection Authority		2025–2030
9.2	Encourage the development of embodied carbon and circularity metrics for the built environment to measure the progress towards circularity and decarbonisation and monitor achievement and effectiveness of minimum standards.	Green Industries SA	Department for Environment and Water Department for Infrastructure and Transport Green Building Council of Australia	2025–2030
9.3	Continue to support producer awareness, knowledge and adoption of compost and other soil amendments to replenish soil carbon and nutrient stocks.	Department of Primary Industries and Regions		Ongoing

Cross-cutting enablers

CROSS-CUTTING ENABLERS				
	Action	Leads	Partners	Timing
10.1	Undertake a review of the *Green Industries SA Act 2004* and consider legislative amendments to update the objectives and functions of Green Industries SA in the context of enabling a circular economy.	Green Industries SA		2025–2028
10.2	Promote the application of circular economy principles across state government policies, strategies and legislation.	Green Industries SA	State government departments and agencies	Ongoing
10.3	Support the integration of circular economy principles and practices into the design and delivery of state government programs and services where relevant.	Green Industries SA	State government departments and agencies	Commencing 2026

Other areas

Energy from waste

Energy from waste (EfW) (also referred to as waste to energy and energy recovery), refers to the recovery of energy from waste materials. The technology comes in different forms, the most common being mass burn incineration, gasification, pyrolysis, anaerobic digestion, biogas, and refuse-derived fuel. It is noted that some processes can be used for both EfW and recycling, such as gasification and pyrolysis in the advanced recycling of segregated plastic inputs.

Some processes which produce energy from waste can be regarded as circular, depending on both the material inputs and the material outputs, and the use of outputs. Processes where source segregated organic inputs are used to create energy and produce a material output which has an environmentally beneficial application to land are considered circular. The below discussion does not apply to these processes.

> " **In general, waste-to-energy is a linear activity which results in the loss of finite materials. It is therefore not considered to be part of a circular economy"**
>
> **ELLEN MACARTHUR FOUNDATION, 2020**

There is growing interest in Australia, including SA, in the use of EfW technologies to tackle the amount of residual waste going to landfill. However, consigning residual waste to an EfW process is not regarded as a circular pathway for waste materials in the same way that disposal to landfill is not circular. Neither pathway is ideal.

Since the release of the 2020–25 waste strategy, Australia's first major EfW power plant at Kwinana in Western Australia has begun incinerating household refuse and other waste streams to manage waste. Once fully commissioned, it intends to generate electricity into the grid. The plant is designed to process up to 460,000 tonnes of waste annually – about a quarter of the amount Perth sends to landfill. Another 300,000-tonne-a-year incineration facility is under construction nearby at East Rockingham, south of Perth. Four licences to build major EfW facilities have been issued in Victoria and there are proposals in New South Wales, Queensland and South Australia (The Guardian, 2024).

This strategy recognises that commercial settings, technological advances and demand for low or zero emission fuels are potentially more favourable for EfW proposals in SA now, and into the future, than during the term of previous waste strategies.

A report by the Australian Council of Recycling indicates the cost of investing in these energy recovery technologies has been enabled by the rising cost of landfill, driven in part by increasing landfill levies (Australian Council of

Recycling, 2021]. Charging higher levies on waste to landfill is designed to create a commercial incentive to encourage higher value uses for these waste streams and reduce disposal to landfill. The landfill levy in SA for 2025–26 is $166 per tonne for metropolitan waste disposed to landfill, and half of that for waste disposed in regional landfills. When combined with the gate fee charged by landfill operators as well as transportation costs, the total cost for disposal to landfill for waste is much higher. Should further increases in total landfill disposal costs occur in coming years, this will encourage further investigation and potential investment in alternative disposal pathways.

The European Union, which has relied on waste incineration for the past few decades, is now moving away from thermal EfW and other forms of incineration and is focusing on more ecologically acceptable solutions such as waste prevention, reuse and recycling as it shifts towards a circular economy. Zero Waste Europe note 'the European financial institutions are now choosing to support alternatives that are less carbon-intensive and are higher on the waste hierarchy, excluding Waste-To-Energy incineration from their sustainability agenda' [Zero Waste Europe, 2021].

While this strategy supports the view that, in general, EfW is not part of the circular economy, it is recognised that recovering energy from residual waste [that is, materials that would otherwise be sent to landfill largely without benefit] is preferential to landfill disposal under the waste management hierarchy. However, it is also recognised that when residual waste is disposed to landfill, effective landfill gas capture is not only important in reducing the harmful impacts of landfill, it also has the ability to displace fossil fuel electricity generation. This strategy similarly recognises that where EfW is used to replace the use of fossil fuels [and not replacing the use of renewable energy], there can be associated GHG emission reduction benefits.

With the support of South Australian government policy settings, legislative and regulatory frameworks, incentives [grants and loans], commercial investments, education, awareness and other activities, South Australia already has well-established recycling systems across multiple waste streams and high landfill diversion rates. Building on our top-performing resource recovery and recycling achievements, the state is committed to a circular economy transition.

SA has been careful not to undermine its achievements in recycling and circular economy transition. When the SA EPA published the *Thermal energy from waste [EfW] activities – Position Statement* in 2020 it aimed to provide guidance to industry to ensure that the recovery of EfW in SA supported the Objects of the *Environment Protection Act 1993* and the Waste Management Objective of the *Environment Protection [Waste to Resources] Policy 2010*, and assisted in achieving the objectives of *South Australia's Waste Strategy 2015–2020*, now and into the future. The Position Statement meets the objectives by promoting the waste management hierarchy [Figure 10, Appendix A] to drive circulation of materials through the material resource recovery process and back into the productive economy prior to undertaking EfW activities. As such, the enhanced circulation of materials through the economy and recycling are preferred outcomes ahead of energy recovery and landfill disposal, in accordance with the waste management hierarchy.

The EPA's Position Statement stipulates that the volumes of waste required by EfW activities must not undermine the waste strategy targets and must also be secure to avoid an underutilised or stranded EfW asset. The position statement addresses thermal EfW technologies, including direct combustion of waste, gasification, pyrolysis, the production and use of refuse derived fuel [RDF], and the mechanical biological treatment of waste where this activity results in the production of RDF. For RDF, the position statement is to be read in conjunction with the *Standard for the production and use of refuse derived fuel* [EPA, 2010]. Non-thermal EfW activities are out of scope in the EPA's Position Statement, however the contextual settings remain relevant to all EfW activities.

For some EfW technologies, such as mass burn incineration, the primary purpose is waste management with energy generation as a secondary benefit. Depending on several factors, including regulatory settings and licensing conditions, the payback periods for investments into such infrastructure may be many decades, having the effect of locking in a demand for constant supply of waste materials over that period. As such, economies of scale will be an important factor for considering EfW facilities in a South Australian context. Being a state with a small population, South Australia needs to be mindful of avoiding issues of overcapacity which could easily create a system that is too heavily reliant on waste as a fuel source.

EfW proposals must demonstrate how they will support the objectives of this strategy and adapt to changes in the quantity and composition of residual waste in SA over time that result from ongoing government policies, programs and activities that aim to increase the recovery of recyclable and organic materials for the reuse, recycling and organics recycling sectors to realise the strategy's targets and circular economy aspirations.

While EfW will not alleviate SA's consumption of virgin materials, and would not transit the state significantly closer to a circular economy, this strategy recognises a role for EfW facilities in SA where they:

- meet best-practice environment protection requirements

- reduce waste to landfill

- do not undermine circular economy principles

- support higher value circularity outcomes such as waste avoidance, reuse and recycling

- demonstrate social licence with communities.

ENERGY FROM WASTE				
	Action	Leads	Partners	Timing
11.1	Consider regulatory measures to reinforce that energy from waste activities occur in accordance with the waste management hierarchy and circular economy principles where materials are kept in use at their highest value for as long as possible.	Environment Protection Authority		2025–2030

Illegal dumping and litter

In a circular economy, litter and illegal dumping are viewed as leakage. They also cause environmental pollution.

Illegal dumping

Illegal dumping of waste is problematic for several reasons, including impacts on the environment and amenity, undermining of legitimate waste and resource recovery operators who operate legally and through an EPA-issued licence, loss of valuable resources from the economy, and clean-up costs. While unlawful disposal of waste is an offence under environmental legislation, improvements can be made to tighten existing provisions. Effective product stewardship schemes which provide accessible collection points can also contribute to reducing instances of illegal dumping.

Litter

The *Local Nuisance and Litter Control Act 2016* is administered by local government and provides for management of littering and illegal dumping in SA. Plastics, cigarette butts, paper and carboard are the most frequently littered items in SA. Actions that South Australia has taken on single-use plastics plays a role in reducing plastic litter, as these products are often used briefly and discarded away from home, resulting in many of these items presenting in the litter stream.

The *Single-use and Other Plastic Products (Waste Avoidance) Act 2020* provides a framework that allows restrictions and prohibitions to be imposed in relation to the manufacture, production, distribution, sale or supply of certain single-use and other plastic products in SA. The objects of the Act include promoting and supporting better waste management practices including the reduction of marine litter. Since 80% of marine litter originates from land-based sources, reducing the availability of common plastic litter items supports these efforts.

Community education is an important tool for litter prevention. 'Litter Less' is an educational resource developed by KESAB environmental solutions for primary school teachers and students to plan and implement litter prevention strategies. KESAB also partners with the Department for Infrastructure and Transport on the Road Watch – Adopt a Road program to address roadside litter.

ILLEGAL DUMPING AND LITTER				
	Action	Leads	Partners	Timing
11.2	Consider legislative reform regarding unlawful disposal of waste, that further disincentivises illegal dumping, prevents the loss of valuable materials from the economy, and ensures a level playing field for licenced waste industry operators.	Environment Protection Authority		2025–2030
11.3	Provide community education to support the reduction of litter.	Green Industries SA		Ongoing
11.4	Consider measures to address additional problematic plastic waste streams that cause marine or land litter or pollution.	Green Industries SA	Environment Protection Authority	2026–2027

Disaster waste management

The frequency and intensity of extreme weather-related events is increasing due to climate change, with particular risks for regional and remote areas. In recent years South Australians have experienced large-scale bushfires, severely impacting Yorketown, Keilira, the Adelaide Hills and Kangaroo Island, and more recently the River Murray flood event – one of SA's most devastating disasters, disrupting every facet of life along the river.

Such disaster events generate volumes of debris and other waste that can overwhelm existing systems and infrastructure for waste management. How this material is managed can have real and long-lasting impacts on affected communities and the environment, including:

- human health and environmental outcomes as a direct or indirect consequence of a disaster

- longer term economic and social recovery.

Under the State Emergency Management Plan, GISA is the Functional Lead for disaster waste management and is responsible for identifying and coordinating delivery of activities, projects and programs aimed at increasing the preparedness of the state to undertake responsible disaster waste management. This includes ensuring that the state government, local councils, zone emergency management committees, waste management facility operators, and community members (that is, householders and businesses) are aware of, and are supported in fulfilling their responsibilities under the Disaster Waste Management Capability Plan. Each of these stakeholder groups has a responsibility to consider their own context-specific hazards and issues posed by managing waste arising from a disaster, and to take action to reduce the potential impacts of these hazards and issues prior to a disaster event.

In the response and recovery phases following a major disaster event, the Functional Lead for disaster waste management identifies and coordinates the delivery of any government support for disaster waste management as required. The combination of disaster preparedness planning and a coordinated delivery of disaster waste management support can lead to a more efficient clean-up for the affected community, and better recycling outcomes for materials arising from disasters.

DISASTER WASTE MANAGEMENT				
	Action	Leads	Partners	Timing
11.5	Encourage planning, including at the zone level, for response to disaster and other disruptive events to strengthen community resilience and ensure continuity of waste management services and/ or adapting to changes in waste management requirements.	Green Industries SA	Local government Local Government Association of SA	Ongoing
11.6	Ensure planning and investment in waste and resource recovery infrastructure to provide adequate waste management resilience and continuity in response to disaster and other significant disruptive events.	Green Industries SA	Local government	Ongoing

Mineral resources

The clean energy transition, both locally and globally, will increase demand for a range of critical and strategic minerals. Minerals including lithium, nickel, cobalt, manganese, graphite, copper, aluminium and rare earth elements are essential to the renewable energy technologies needed to drive this change (Department of Industry, Science and Resources, 2023a). SA has 69% of Australia's copper reserves, 65% of Australia's graphite resources, and the world's largest zircon mine, with cobalt, rare earth elements, halloysite and magnesium also found (Department of State Development, 2025; Department for Energy and Mining, 2024).

The International Energy Agency has modelled that in a global net zero by 2050 scenario, mineral demand in 2040 will be 6 times higher than in 2020 (International Energy Agency, 2021). Circular economy strategies, including reducing consumption, increasing product lifespan, and recovering materials and minerals from end-of-life products, can help manage this and reduce demand for new mineral extraction by up to 58% (Simas et al, 2022). The Australian Government's *Critical Minerals Strategy 2023-2030* recognises the role of the circular economy in reducing the environmental impact of the critical minerals sector, including through recycling and reprocessing materials (Department of Industry, Science and Resources, 2023b).

Within the mineral resources sector itself, circular economy opportunities include recovering critical and strategic minerals from mine tailings and other mining waste, and repurposing waste rock (Schandl et al, 2024). In addition to helping meet the demand for the critical and strategic minerals needed for the clean energy transition, these initiatives also contribute to increasing South Australia's circularity rate and material productivity.

| MINERAL RESOURCES				
	Action	Leads	Partners	Timing
11.7	Improve materials productivity through circular economy initiatives including the recovery of valuable minerals, such as critical minerals and rare earth minerals, from mine tailings and other mining waste, and repurposing of waste rock.	Mineral resources industry	Mineral resources industry associations Department for Energy and Mining	Ongoing

APPENDICES

Appendix A – Guiding principles

The circular economy

The circular economy is an economic model designed to prioritise sustainability, resource efficiency, and waste reduction. It aims to move away from the traditional linear economic model of 'take-make-waste' and instead seeks to create a closed-loop system where products and materials are kept in use for as long as possible, with their value preserved and waste minimised.

Figure 9: South Australia's circular economy, Green Industries SA
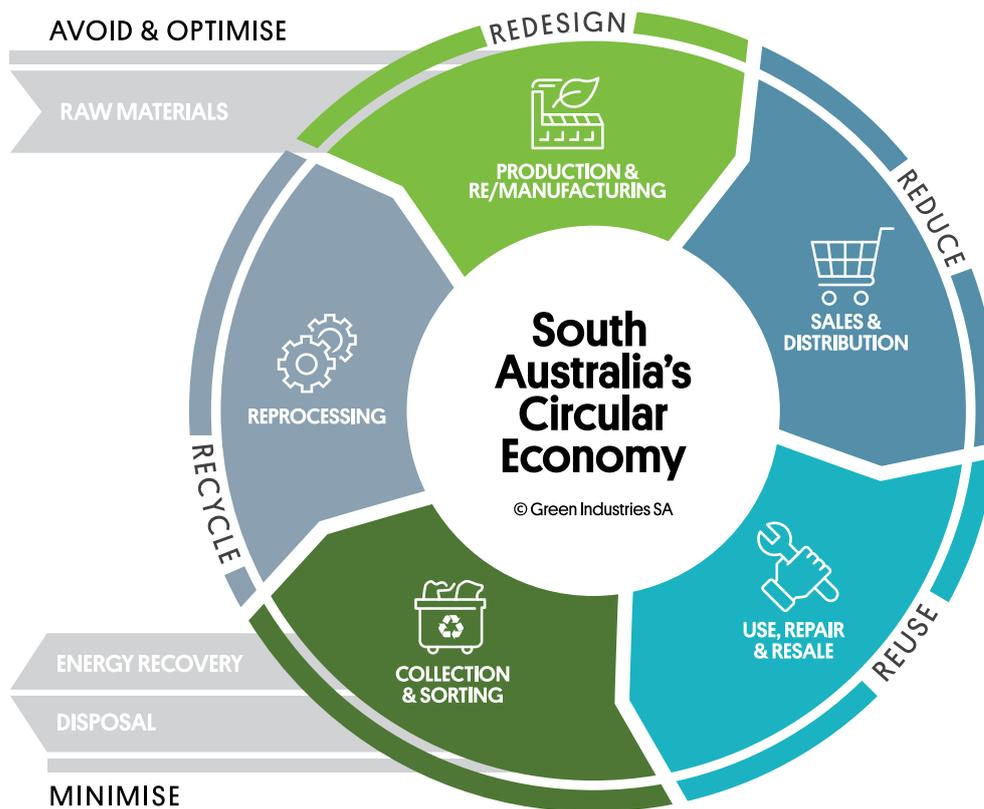
A circular economy is based on 3 principles:

- Design out waste and pollution
- Keep products and materials in use at their highest value
- Conserve natural resources and regenerate nature

Transitioning to a circular economy requires a de-coupling of economic activity from the consumption of finite resources, through transforming our ways of producing and consuming, including improving material productivity in economic development. This transition is essential to achieving net zero emissions, reducing pollution and tackling biodiversity loss while supporting the needs of current, as well as future, generations of South Australians in a way that doesn't cost the earth.

The waste management hierarchy

The waste management hierarchy is an internationally recognised framework that establishes a preferential order of waste management options to reduce and manage waste. The activities at the top of the hierarchy have the highest environmental benefit. In SA, the waste management hierarchy is a fundamental guiding principle in the *Green Industries SA Act 2004* and is also given legislative effect through the *Environment Protection Act 1993* and the *Environment Protection (Waste to Resources) Policy 2010*.

The top 3 tiers (avoid, minimise/reduce and reuse), are waste prevention and resource efficiency activities – actions taken that keep an item, component or material in use and stop it from becoming waste or entering a waste management facility or system. These activities are distinct from the activities of recycling or resource recovery, that divert materials from landfill pathways after they have been generated through production and manufacturing processes, or have entered a waste management process post-consumer or commercial use, by returning them back to the economy as a resource – not waste.

Overlaying the waste management hierarchy with circular economy principles, activities in the top 4 tiers align with the circular economy principle of designing out waste and keeping products and materials in use. However, both high-value recycling and low-value reprocessing (referred to as 'downcycling') sit within the recycle tier, even though they achieve circularity outcomes of different values. Activities at the bottom of the hierarchy (least preferred), such as energy recovery through incineration of waste, and disposal to landfill are non-circular as the materials are no longer circulating within the economy. Providing additional clarity on where different activities sit within the hierarchy would help inform regulatory approaches and decision-making[13].

Figure 10: South Australia's waste management hierarchy

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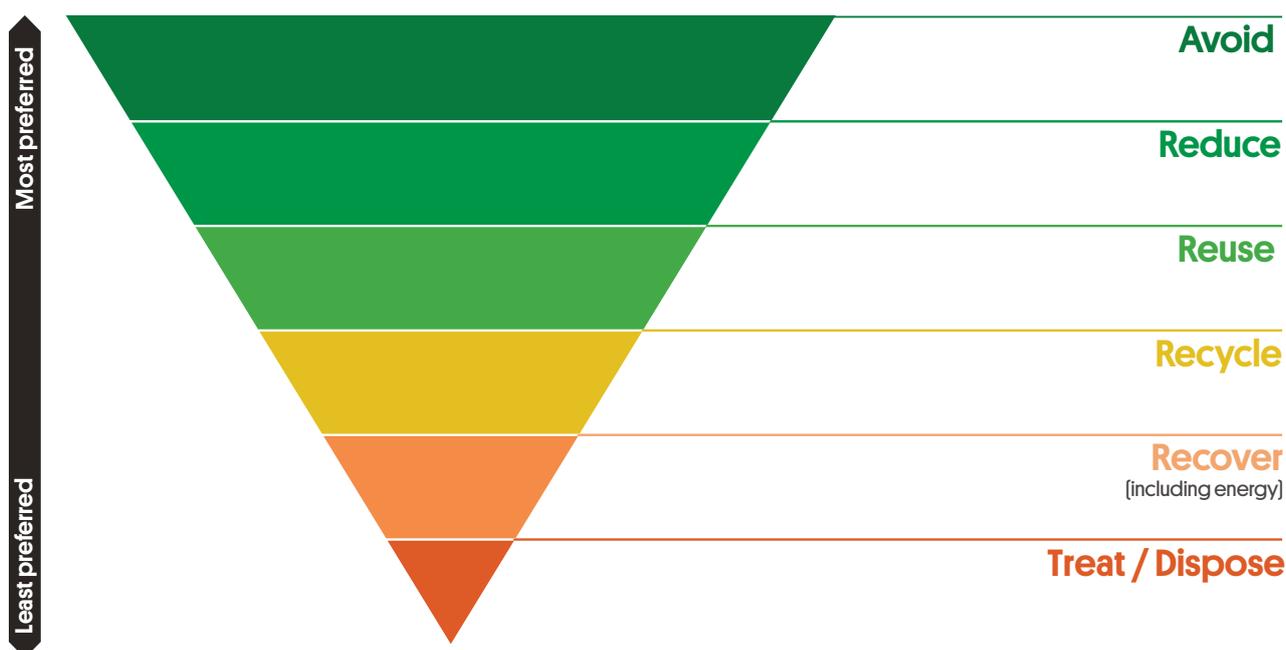
13   These matters are being considered through the EPA's review of the *Environment Protection (Waste to Resources) Policy 2010*.

Ecologically sustainable development

The *Green Industries SA Act 2004*[14], sets out the principles of ecologically sustainable development, being:

principles that maintain -

(i) that the use, development and protection of the environment should be managed in a way, and at a rate, that will enable people and communities to provide for their economic, social and physical wellbeing, and for their health and safety while-

    (A) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; and

    (B) safeguarding the life-supporting capacity of air, water, land and ecosystems; and

    (C) avoiding, remedying or mitigating any adverse effects of activities on the environment; and

(ii) that proper weight be given to both long and short term economic, environmental, social and equity considerations in deciding all matters relating to environmental protection, restoration and enhancement.

Best practice methods and standards in waste management and the efficient use of resources

Best practice in waste management strives to achieve quality and optimal results, and can be used as a benchmark, as distinct from meeting mandatory standards. Best practice evolves over time as efforts towards continuous improvement lead to better ways of doing things. The strategy, in addition to other publications released by GISA, points to what GISA considers to be best or better practice in waste management and the efficient use of resources at a given point in time.

The use of standards that provide clarity regarding definitions, limits, or rules and are approved, monitored and reported by an independent, authoritative organisation or recognised entity, can provide a minimum acceptable benchmark and a level playing field, and potentially more stable commercial settings.

The efficient use of resources, that is, our natural capital, is essential to a sustainable future, and refers to not being wasteful and doing more with less. This principle aligns with the metric 'material productivity', which is explained further in Target 2.

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14   s 3A(2)(c) *Green Industries Act 2004* (SA)

Appendix B – Benefits of a circular economy

There are many benefits in transitioning to a circular economy.

Retain economic value

Circular activities and processes add economic value by extending the usable life of products, then when products reach their end-of-life, by recovering the valuable materials a product contains and keeping them in use within the economy.

Regenerate natural systems

Extending the usable life of products and keeping materials circulating reduces the demand for extraction of virgin resources. It also reduces the amount of waste, pollution and GHG emissions created, and achieves savings on energy and water use, contributing to the regeneration of natural systems.

Table 2 lists the environmental benefits of recycling South Australian materials in 2023–24.

Enhance economic prosperity

Modelling by the CSIRO on Australia's *Circular Economy Framework* indicates that doubling Australia's circularity in line with the framework's priorities will not only reduce Australia's GHG emissions by 14% by 2035 and divert 26 million tonnes of material from landfill each year, but also increase Australia's GDP by $26 billion each year by 2035 [Department of Climate Change, Energy, the Environment and Water, 2024e].

A 2024 CSIRO Report, *Australia's circular economy comparative and competitive advantages*, outlines how Australia can forge new international partnerships to foster the purchase of Australian-made circular products, help close loops for end-of-life materials, and supply circular inputs to domestic manufacturing. By doing this, Australia can unlock vast economic value while reversing the substantial loss of natural capital [Schandl, et al., 2024].

Build sustainable and resilient businesses and create new circular economy jobs

KPMG's 2020 report, *Potential Economic Pay-off of a Circular Economy*, found that for Australia, a future circular economy in food, transport, and the built environment together represents a potential economic benefit of $23 billion in GDP by 2025. It estimated that by 2047–48, this would rise to $210 billion in GDP, with an additional 17,000 full-time equivalent [FTE] jobs for Australia[15] [KPMG, 2020].

In SA, diverting organics away from landfill and to composting facilities creates 6.1 FTE jobs for every 10,000 tonnes [Green Industries SA, 2021]. In Australia, the recycling sector generates 9.2 jobs per 10,000 tonnes of waste compared with 2.8 jobs for the same amount of waste sent to landfill [CSIRO, 2021]. Even more significant is the data from the *South Australian reuse impact study 2023–24*, which shows that reuse generates 21 times more jobs than recycling, and 69 times more jobs than landfill on a per tonne basis [Rawtec, 2025].

Social benefits

The *South Australian reuse impact study 2023–24* found that reuse organisations reinvested $14.2 million raised through the sale of donated goods into social and community programs in 2023–24, including support for people experiencing homelessness, people with a disability, youth, elderly people and families, emergency relief, and promotion of reuse. This is in addition to saving South Australians an estimated $300 per household through buying or receiving second hand goods, compared to buying new.

Reuse organisations also provided an estimated 41,000 hours of training to their paid staff and volunteers, including formal and informal work-readiness training, life skills, case management support, and professional development.

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15   Relative to a business-as-usual scenario and the current level of circularity in the Australian economy.

Category	Type	GHG emissions saved	Energy saved	Water saved
		Emissions factor (t CO_2-e/t)	Conversion factor (GJ LHV/t)	Conversion factor (kL/t)
Masonry	Asphalt	0.030	2.380	0.880
	Bricks	0.020	0.280	1.260
	Concrete	0.020	0.350	1.280
	Plasterboard	0.030	0.550	-0.030
	Clay, fines, rubble and soil	0.088	1.420	0.440
Metals	Iron and steel	0.440	7.490	-2.360
	Aluminium	16.667	206.667	29.333
	Non-ferrous metals	0.880	36.090	5.970
Organics	Food organics	0.980	0.180	0.440
	Garden organics	0.670	0.309	5.592
	Timber	0.180	10.730	-0.040
	Organics – other	0.481	2.165	0.230
Cardboard and paper	Cardboard and waxed cardboard	0.169	0.467	11.111
	Liquid paperboard	0.169	0.467	11.111
	Magazines	0.455	0.364	10.909
	Newsprint	0.455	0.364	10.909
	Phonebooks	0.455	0.364	10.909
	Printing and writing paper	1.300	-0.680	11.000
Plastics	Polyethylene terephthalate	1.200	55.000	68.750
	High density polyethylene	0.825	50.000	22.750
	Polyvinyl chloride	0.313	30.000	26.250
	Low density polyethylene	0.825	50.000	22.750
	Polypropylene	0.313	30.000	26.250
	Polystyrene	0.313	30.000	26.250
	Mixed and/or other plastics	0.313	30.000	26.250
Glass	Glass	0.528	4.444	0.931
Other materials	Fly ash	0.029	0.552	1.260
	Foundry sands	Not specified as insufficient reference data identified		
	Leather and textiles			
	Tyres and other rubber	1.070	64.080	52.250

This table lists a set of factors used to estimate the environmental benefits of recycling SA materials in 2023–24. They are based on a study commissioned by Green Industries SA, and the GHG emissions factors updated in 2021–22 for food organics, garden organics and timber (Trellis Technologies, 2019). The emissions factors for food organics, garden organics and timber were calculated by Blue Environment based on *National Greenhouse and Energy Reporting (Measurement) Determination 2008* methods. The calculations compared emissions from landfilling these organic types (assuming a landfill gas recovery rate of 43%) compared with emissions from composting them.

Appendix C – Progress against 2020–2025 waste strategy targets

Achievements relative to the 2020–2025 waste strategy targets are depicted in the graphs below.

Figure 11: 2020–2025 waste strategy waste generation per capita target and achievements
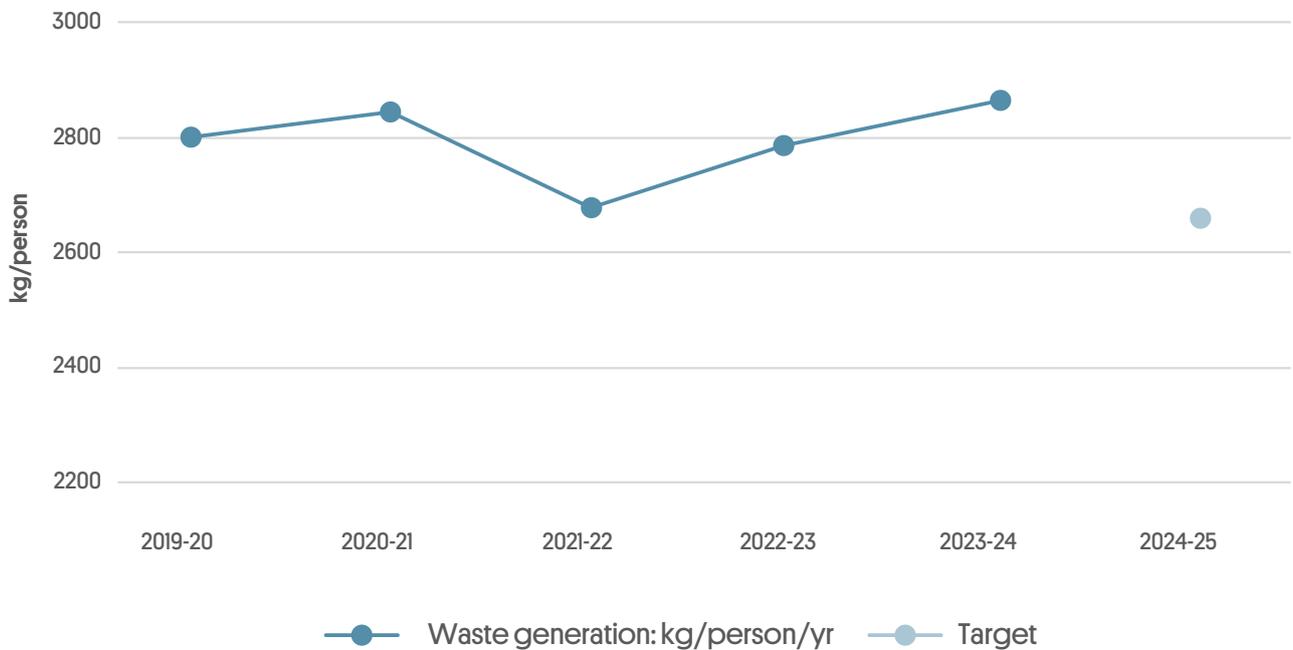

Figure 12: 2020–2025 waste strategy MSW and kerbside bin diversion targets and achievements
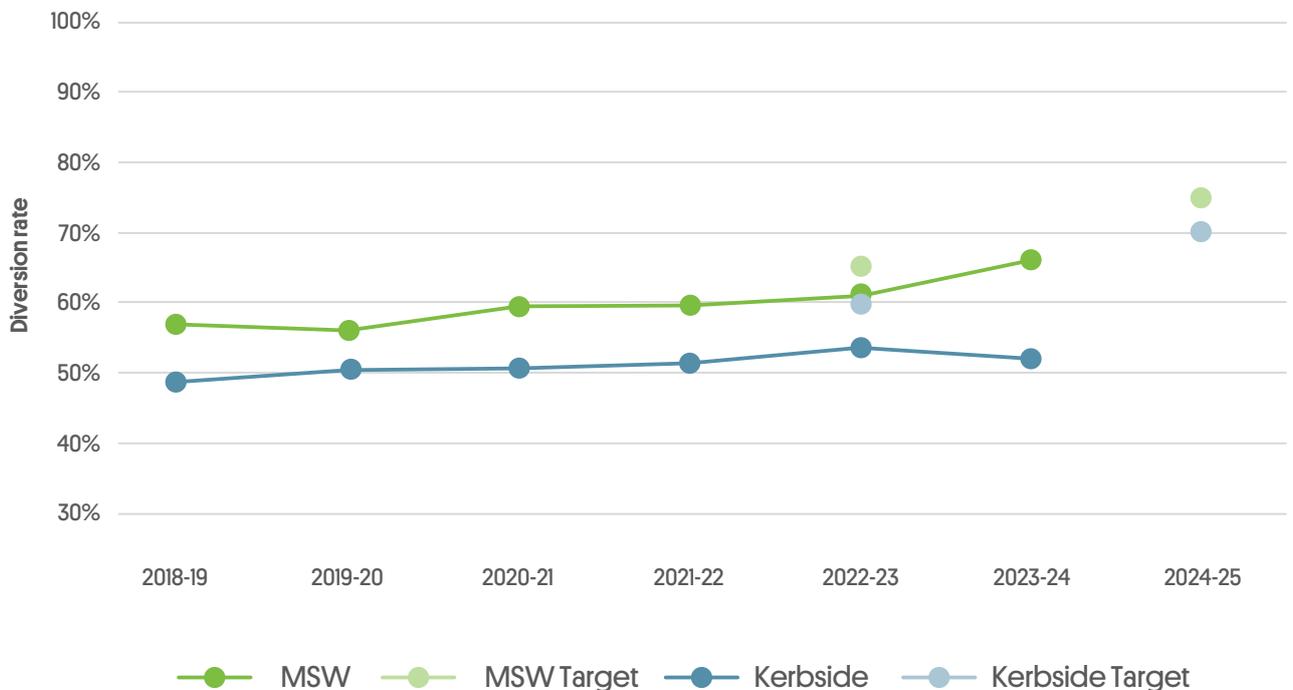
**Figure 13:** 2020–2025 waste strategy C&I diversion target and achievements
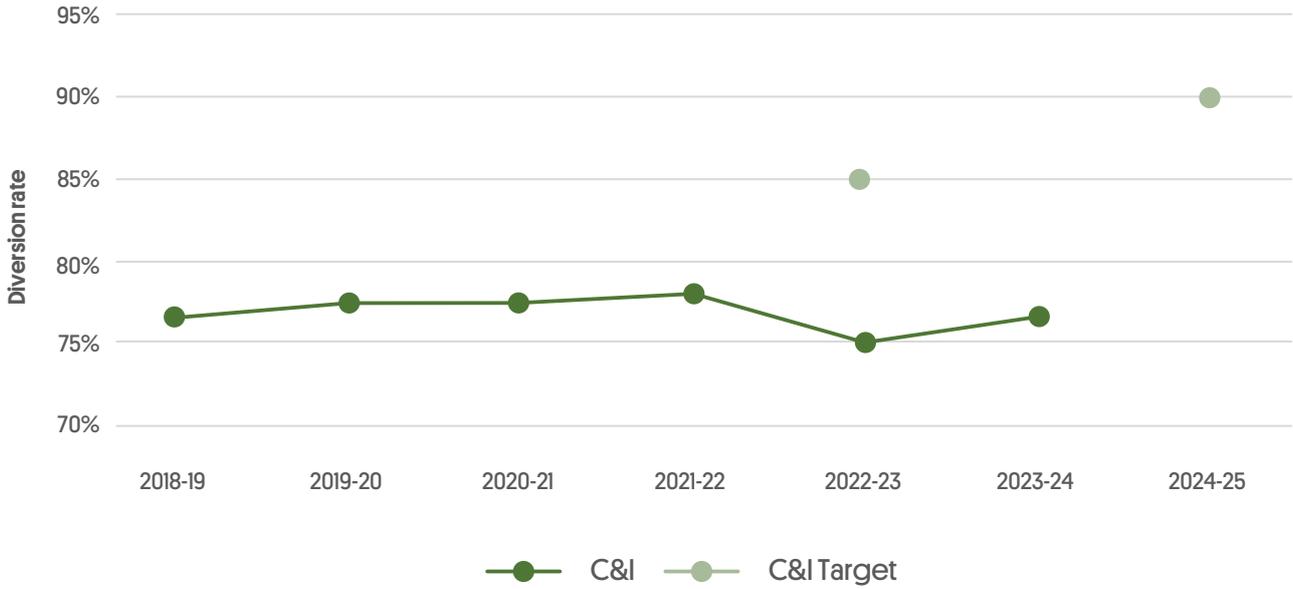
Figure 14: 2020–2025 waste strategy C&D diversion target and achievements
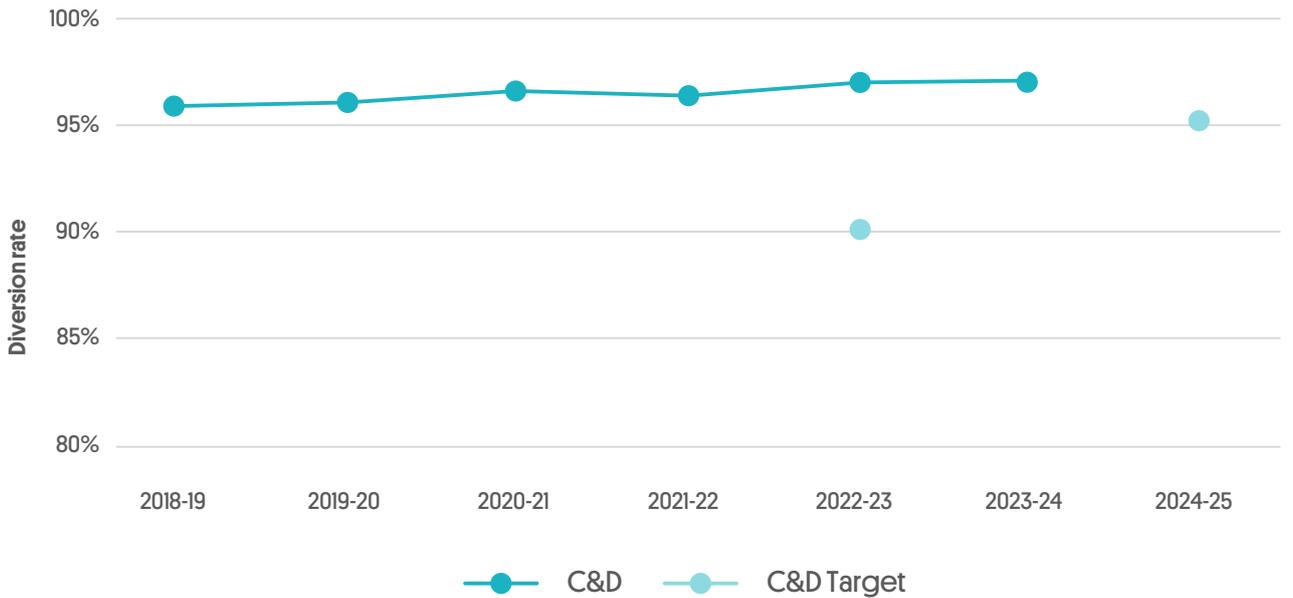
In relation to the above graphs (figures 13 and 14), it is important to note that new data modelling has been retrospectively applied to the C&I and C&D diversion rates. This improved model reflects adjusted proportions of landfilled quantities by source waste streams, as set out in Figure 15 below, based on a 2022 landfill audit and data from EPA mass balance reporting. The targets in the 2020–2025 strategy were set based on the previous data, which estimated a lower C&D diversion rate and a higher C&I diversion rate.
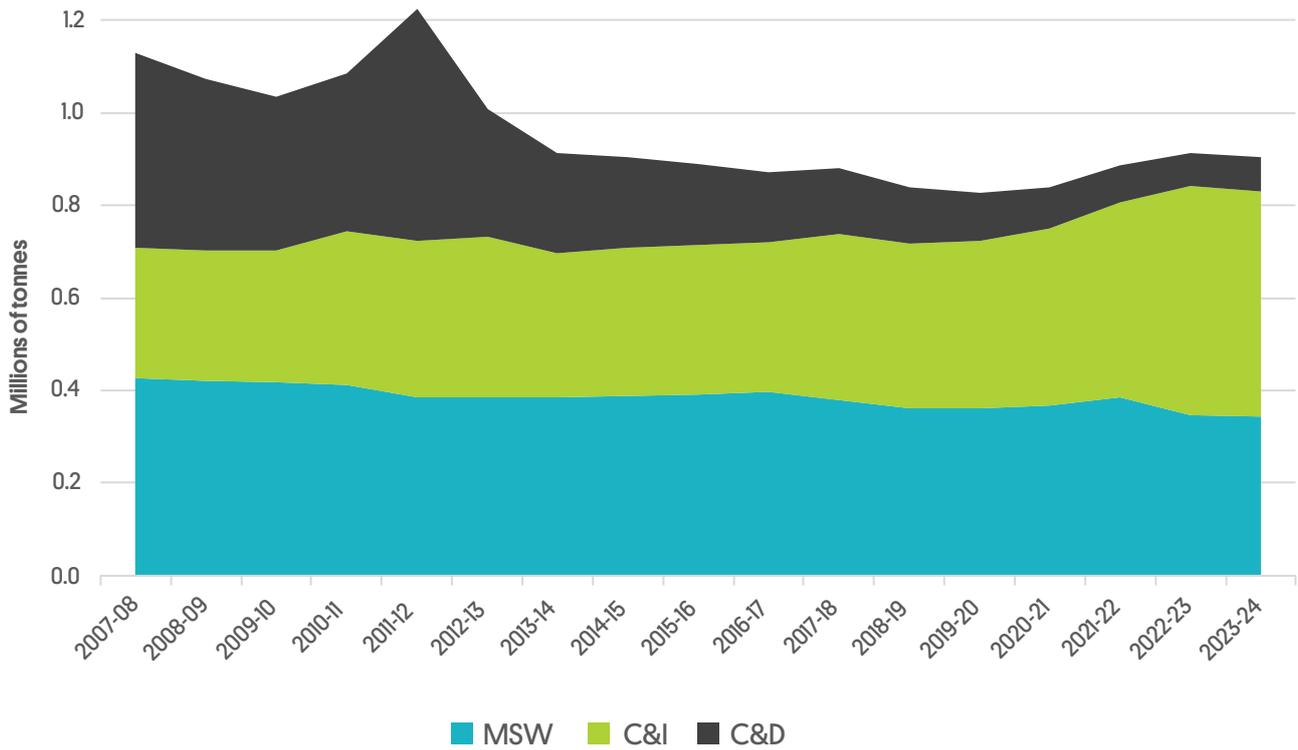
Appendix D – Legislative and policy context

International

The following International Conventions, Treaties and Agreements have relevance to this strategy:

- 2030 Agenda for Sustainable Development
- United Nations Framework Convention on Climate Change
- Kunming-Montreal Global Biodiversity Framework
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
- Montreal Protocol on Substances that Deplete the Ozone Layer

National

Measuring What Matters

Measuring What Matters: Australia's First Wellbeing Framework, published in 2023, tracks our progress towards a more healthy, secure, sustainable, cohesive and prosperous Australia. The Australian Government aims to embed this framework into government decision making.

One of the framework's 5 wellbeing themes is 'Sustainable: A society that sustainably uses natural and financial resources, protects and repairs the environment and builds resilience to combat challenges'. Underneath this theme sits 'circular economy' with the explanation of 'why this matters' being 'Australians are aware of the impact of using resources and are strongly invested in participating in a more sustainable, circular economy where materials are used more efficiently and are recycled, reused and repaired'.

The metrics being used to measure our national progress on a circular economy are:

1. waste generation per person
2. proportion of waste recovered for reuse, recycling or energy
3. circularity rate
4. material footprint per capita
5. material productivity.

(Australian Bureau of Statistics, n.d.)

National Food Waste Strategy

The *National Food Waste Strategy: Halving Australia's Food Waste by 2030*, released in 2017, provides a framework to support collective action towards halving Australia's food waste by 2030, and contributes toward global action on reducing food waste by aligning with SDG 12 [Commonwealth of Australia, 2017]. It also helps give effect to Australia's obligations under the *United Nations Framework Convention on Climate Change* in helping reduce GHG emissions, primarily through the diversion of food waste from landfill.

The Environment Ministers Meeting (EMM) is an intergovernmental forum in which national environmental issues are progressed and a forum to discuss strategic issues and agree cross-government actions to improve Australia's environment. It is comprised of the Commonwealth Minister for the Environment, and the Environment Minister from each Australian state and territory. Decisions made at EMM are communicated through agreed communiques. Some of these decisions, relevant to this strategy, are as follows:

- Work with the private sector to design out waste and pollution, keep materials in use and foster markets to achieve a circular economy by 2030 (Department of Climate Change, Energy, the Environment and Water, 2022).

- Commonwealth packaging regulations that mandate how packaging is designed, sets minimum recycled content requirements, and prohibits harmful chemicals such as per- and poly-fluoroalkyl substances (PFAS) being used (Department of Climate Change, Energy, the Environment and Water, 2023d).

- A national traceability framework which is key to driving the reuse of recovered plastics, glass and other materials, into new products – and to our transition to a circular economy (Department of Climate Change, Energy, the Environment and Water, 2023a).

- Developing stronger end markets for recycled products (Department of Climate Change, Energy, the Environment and Water, 2024a).

- A framework to accelerate product stewardship and to better coordinate work across governments, including Western Australia leading on tyres, New South Wales leading on solvents, and Queensland, New South Wales and Victoria leading work for all batteries (Department of Climate Change, Energy, the Environment and Water, 2024a).

Net zero

The Australian Government has a legislated target of net zero GHG emissions by 2050 and a 2030 target of 43% below 2005 levels. Australia's Net Zero Plan has since gone further and committed Australia to reduce emissions by 62 to 70% on 2005 levels by 2035 as the next step on our path to net zero. One of the plan's priorities is to implement Australia's Circular Economy Framework to double circularity by 2035 (Department of Climate Change, Energy, the Environment and Water, 2025c).

South Australia

Legislation

Green Industries SA Act 2004

Guiding principles

- The principles of the circular economy (refer Figure 9)

- The waste management hierarchy (refer Figure 10)

- The principles of ecologically sustainable development

- Pursuit of best practice methods and standards in waste management and the efficient use of resources

Environment Protection Act 1993

Objects

- Promote the principles of ecologically sustainable development

- Prevent, reduce, minimise and eliminate harm to the environment by:

  » promoting application of the waste management hierarchy

  » regulating activities, products, substances and services that cause environmental harm through production of waste

- Promote the circulation of materials through the waste management process and to support a strong market for recovered resources by:
    » regulating waste management
    » regulating resource recovery
- Address climate change adaptation and climate change mitigation

Environment Protection (Waste to Resources) Policy 2010[16]

Key features

- Sustainable waste management objective
- Requirement for resource recovery processing for most metropolitan Adelaide waste
- Defines when material ceases to be waste
- Prescribes items that are banned from disposal to landfill
- Regulates illegal dumping and inappropriate stockpiling

Single-use and Other Plastic Products (Waste Avoidance) Act 2020

Objects

- Restrict and prohibit the manufacture, production, distribution, sale and supply of certain single-use and other plastic products
- Promote better waste management practices including the reduction of marine litter
- Promote the principles of the waste management hierarchy
- Promote the principles of the circular economy

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16 The *Environment Protection (Waste to Resources) Policy 2010* is currently being reviewed and modernised.

Glossary

TERM	DEFINITION
3-bin system	A council kerbside bin collection system which provides 3 bins, for general waste, co-mingled recyclables, and food and garden organics.
Beneficial use	The outcome of the use or reuse of a product or material being a net environmental benefit, that is, contributing to environmental sustainability and resource efficiency.
CCA treated timber	Copper chromated arsenate treated timber – timber that has been treated by a chemical preservative containing compounds of copper, chromium and arsenic to protect it from insects, pests, and microbes, as well as provide resistance to the weather.
Chemicals of concern	Chemicals that have properties raising environmental or health concerns. These include chemicals that do not break down easily, are toxic, or can accumulate to high levels in animals.
Circular economy	An economic model designed to prioritise sustainability, resource efficiency, and waste reduction. It aims to move away from the traditional linear economic model of 'take-make-dispose' and instead seeks to create a closed-loop system where products and materials are kept in use for as long as possible, with their value preserved and waste minimised.

It is based on 3 principles – design out waste and pollution, keep products and materials in use (ideally at their highest and best value), and regenerate natural systems) |
Circularity Rate	A measure of how much material input into an economy comes from recycled or reused sources. It indicates the proportion of resources that are cycled back into production rather than being disposed of as waste.
Climate change adaptation	Adjusting to the actual or expected effects of climate change.
Climate change mitigation	Limiting, reducing or preventing GHG emissions.
Closed loop system	A system where materials are recycled into the same product type and are of the same quality and functionality as the original material.
Commercial and industrial (C&I) waste	Solid waste arising from commercial, industrial, government, public or domestic premises (other than municipal solid waste), but does not contain listed waste, hazardous waste or radioactive waste.
Common core	Interdisciplinary subjects or courses, available to all students of a tertiary education institution.
Compost	Pasteurised material resulting from the controlled microbiological transformation of compostable organic waste under aerobic and thermophilic conditions for not less than 6 weeks
Construction and demolition (C&D) waste	Solid waste arising from the construction, demolition or refurbishment of buildings or infrastructure, but does not contain municipal solid waste, commercial and industrial waste, listed waste, hazardous waste or radioactive waste.
Contaminants/contamination	Waste that ends up in streams where it does not belong and affects the processing and recycling of that material.
Critical minerals	Critical minerals are metallic or non-metallic materials that are essential to our modern technologies, economies, and national security, and whose supply chains are vulnerable to disruption.
Dispose	Dispose of waste, including the deposit of waste and causing or allowing waste to be disposed or deposited.
Diversion	The amount of waste generated that's not sent to landfill. It is calculated as the total of waste recovered through resource recovery processes divided by the total amount of waste generated as a percentage.

TERM	DEFINITION
Domestic material consumption	The total amount of materials directly used in the economy (used domestic extraction plus imports), minus the materials that are exported.
Downcycling	Downcycling is the process of breaking down a material to make something new but of a lower quality and functionality than the original product. This can be due to contamination or natural degradation over time.
E-waste	Waste electrical and electronic equipment which is dependent on electric currents or electromagnetic fields in order to function (including all components, subassemblies and consumables which are part of the original equipment at the time of discarding).
Ecologically sustainable development	The use, development and protection of the environment in a way, and at a rate, that will enable people and communities to provide for their economic, social and physical wellbeing and for their health and safety while: • sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations • safeguarding the life-supporting capacity of air, water, land and ecosystems, and • avoiding, remedying or mitigating any adverse effects of activities on the environment.
End-markets	The final transaction point in a value chain, where a product or service is sold to the end customer.
End-of-life	The point at which a product or material can no longer be used for its original intended purpose.
Energy recovery	Processes through which wastes are collected, sorted and processed to recover energy in usable form, for example process heat, steam or in electricity generation.
Environmental, social and governance (ESG)	A framework used to assess an organisation's operations concerning environmental stewardship, social responsibility, and corporate governance practices.
Environment Ministers Meeting	Comprises the Commonwealth Minister for the Environment, and the Environment Minister from each Australian state and territory.
Fast fashion	Inexpensive clothing produced rapidly by mass-market retailers in response to the latest trends.
Feedstock	A basic material that is used to produce goods, finished goods, energy, or intermediate materials that are feedstock for future finished products.
Food waste	Food that does not reach the consumer or reaches the consumer but is thrown away. Food waste can be generated by households or industry, and includes food processing waste, out of date or off specification food, meat, fruit and vegetable scraps.
Greater Adelaide	The part of South Australia defined as Greater Adelaide, according to section 5 of the *Planning and Development Act 2016*.
Greenhouse gases (GHG)	Gases, including carbon dioxide and methane, that trap heat in the earth's atmosphere, affecting weather and climate patterns.
Gross Domestic Product (GDP)	GDP measures gross value added for all resident institutional units for the whole economy. Gross value added is the difference between output and intermediate consumption for each institutional unit and thereby measures the value created by production. Value added represents the contribution of labour and capital to the production process.
Gross State Product (GSP)	The aggregate which details the total economic production of a state economy and is the state equivalent to GDP

TERM	DEFINITION
Highest value use/reuse	The highest achievable outcome for the use or reuse of products or materials, according to the waste management hierarchy and the second principle of a circular economy (to keep products and materials in use at their highest value). This relates to material resource efficiency and the GHG emissions impact of the intended use or reuse of that product or material. An example of highest value reuse is a glass bottle being recovered for reuse as another glass bottle.
Kerbside waste	Waste collected by local councils from residential properties, including rubbish, mixed recyclables, food organics and garden organics, and glass, but excluding hard waste.
Landfill	A waste disposal site used for the controlled deposit of solid waste onto or into land.
Linear economy	A traditional economic model characterised by a 'take-make-dispose' approach, where resources are extracted, used, and then discarded as waste
Mass balance reporting	Reporting that monitors the movement of waste (material flows) to and from waste depots throughout the state, and tracks stockpiling of materials. Waste depots receiving more than 20,000 tonnes of solid waste per annum (or otherwise directed by the EPA) are required to report monthly to the EPA on quantities of waste or other matter: • received at the site • transported from the site • remaining stockpiled on site • used on site • disposed on site (such as by landfill or incineration).
Material circularity	Refers to the continuous reuse and repurposing of materials to minimise waste and resource depletion, aiming to keep materials in use for as long as possible and at their highest value.
Material flow analysis	A group of methods to analyse the physical flows of materials into, through and out of a given system. It can be applied at different levels of scale, that is, products, firms, sectors, regions, and whole economies. The analysis may be targeted to individual substance or material flows, or to aggregated flows.
Material footprint	Measures the total amount of raw materials extracted globally to meet a country or region's consumption demands, including imported goods. It describes how much material is consumed to make the products or services used in the country or region.
Material intensity	Quantifies the amount of materials used per unit of economic output or service.
Material productivity	Measures the efficiency with which raw materials are used in production processes. It measures the amount of economic output generated per unit of materials consumed. At the national level it is calculated as GDP per domestic material consumption (DMC), measured in AUD per kg.
Materials recovery facility	A facility that receives waste or matter for sorting, aggregating, compacting, baling or packing prior to its transfer elsewhere for lawful reuse.
Metropolitan Adelaide	The part of the South Australia within the boundary of Metropolitan Adelaide as defined in the *Development Act 1993*.
Municipal solid waste (MSW)	Solid waste arising from mainly domestic but also commercial, industrial, government and public premises including waste from council operations, services and facilities that is collected by or on behalf of the council via kerbside collection, but does not contain commercial and industrial waste, listed waste, hazardous waste or radioactive waste.
Natural capital	Another term for the stock of renewable and non-renewable resources (such as plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people.

TERM	DEFINITION
Non-circular	Activities that are a pathway to end-of-life for products or materials as opposed to keeping them circulating in the economy.
PFAS	Per- and poly-fluoroalkyl substances (PFAS) are a group of synthetic chemicals that have been extensively used in consumer and industrial products since the 1950s. They were used to manufacture non-stick coatings and products that require resistance to water, heat, fire, stain and weather. Examples include firefighting foams, carpets and waterproof clothing.
Planning instruments	Instruments that ensure development in South Australia is appropriately located, designed and considered.

They set the strategic planning vision for the state and help to assess development applications that require planning consent as part of their approval.

The instruments are set out by the *Planning, Development and Infrastructure Act 2016* and supporting Regulations. |
Product stewardship	A concept and set of approaches based on the idea that those involved in designing, manufacturing and selling products should accept responsibility for ensuring they do not have adverse impacts on the health of humans and environments. This includes impacts across the life cycle of the products, from the extraction of materials, the way products are used, and how they are managed at end-of-life.
Raw materials	A basic material that is used to produce goods, finished goods, energy, or intermediate materials that are feedstock for future finished products. Also known as feedstock, unprocessed material, or primary commodity.
Recovered materials/recovered resources	Waste materials separated, sorted or processed for the purposes of waste reuse, recycling or energy recovery.
Recycling	To treat materials so that new products can be made from them. A set of processes (including biological) for converting recovered materials that would otherwise be disposed of as wastes into useful materials and or products.
Repair	Altering a product or material to correct damage or fault, maintaining its use.
Resource recovery	Activities through which wastes are collected, sorted, processed (including through composting), and/or converted into raw materials for use in a production system.

For data reporting purposes, the quantity of waste allocated to the fate 'resource recovery' is the sum of the quantities allocated to waste reuse, recycling and energy recovery. |
Resource recovery rate	The quantity of waste that is prevented from going to landfill for use in another way, divided by the quantity of waste generated.
Secondary materials	Recycled materials.
Separately reported materials	Separately reported materials comprise of clay, fines, rubble, soil and fly ash. These materials are reported separately because they can fluctuate significantly across years and between jurisdictions.
Single-use	Designed to be used once and then disposed of.
Source separation	Physical sorting of the waste at the point of generation into specific components suitable for resource recovery from the residual component.
Strategic minerals	Minerals which are important for the global transition to net zero and broader strategic applications, for which Australia has geological potential for resources, and are in demand from our strategic international partners. Their supply chains are not currently vulnerable enough to meet the criteria for the critical minerals list.
Sustainable Development Goals (SDG)	A set of 17 global goals established by the United Nations to address pressing social, economic, and environmental challenges, aiming for a more sustainable and equitable world by 2030.

TERM	DEFINITION
Sustainable procurement	Procurement that looks beyond the up-front cost to make purchasing decisions based on the entire life cycle of the goods and services, taking into account associated costs, environmental and social risks and benefits, and broader social and environmental implications.
Waste avoidance	Preventing waste generation, including through design of products and changing consumer behaviour to preference durable, reusable and reparable products. Also referred to as waste prevention or waste minimisation.
Waste management hierarchy	Reference to an order of priority for the management of waste in which avoidance, minimisation, reuse, recycling, recovery of energy and other resources, treatment of waste to reduce potentially degrading impacts, and disposal of waste in an environmentally sound manner are pursued in that order.
Waste valorisation	The process of enhancing the value of a product, material, or waste by repurposing, recycling, or transforming it into something more valuable or useful.
Virgin materials/virgin resources	Raw materials extracted from the earth for the first time, as opposed to recycled or reused materials.
Waste	As defined in section 4 of the *Environment Protection Act 1993* – any discarded, dumped, rejected, abandoned, unwanted or surplus matter, whether or not intended for sale or for purification or resource recovery by a separate operation from that which produced the matter, whether or not of value.
Waste generation	The process of producing waste. For data and reporting purposes, waste generation is the sum of the quantities of waste taken to waste management facilities or added to on-site stockpiles. Measures of the total amount of waste generated include the waste recycled as well as the waste sent to landfill.
Waste management	The process of managing waste, including storage, collection, transportation, resource recovery, treatment and disposal.

Abbreviations

ACOR	Australian Council of Recycling	
AS	Australian Standard	
BESS	battery energy storage systems	
CCA	copper chrome arsenate	
CDS	container deposit scheme	
CERRR	Circular Economy Resource Recovery Report	
CO_2-e	carbon dioxide equivalent	
CSIRO	Commonwealth Scientific and Industrial Research Organisation	
C&D	construction and demolition	
C&I	commercial and industrial	
DEM	Department for Energy and Mining	
DMC	domestic material consumption	
DWM	disaster waste management	
EfW	energy from waste	
EPA	Environment Protection Authority	
ESG	environmental, social and governance	
EU	European Union	
FOGO	food organics and garden organics	
FTE	full time equivalent	
GDP	gross domestic product	
GHG	greenhouse gas	
GJ	giga joules	
GISA	Green Industries SA	
GSP	gross state product	
IChEMS	Industrial Chemicals Environmental Management Standard	
ISO	International Standards Organisation	
kg	Kilogram	
kL	Kilolitres	
kt	Kilotonne	
LHV	lower heating value	
Li-ion	lithium-ion	
MSW	municipal solid waste	
NABERS	National Australian Built Environment Rating System	
NEMP	National Environmental Management Plan	
PET	polyethylene terephthalate	
PFAS	per- and poly- fluoroalkyl substances	
PV	photovoltaic	
PVC	polyvinyl chloride	
RDF	refuse derived fuel	
SDG	Sustainable Development Goal	
UK	United Kingdom	
UN	United Nations	
UNEP	United Nations Environment Programme	

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