South Australian Government

Climate Change Action Plan 2021–2025

SOUTH AUSTRALIA

Government of South Australia

Acknowledgment of country

We acknowledge and respect the Traditional Custodians whose ancestral lands we live and work upon and we pay our respects to their Elders past and present. We acknowledge and respect their deep spiritual connection and the relationship that Aboriginal and Torres Strait Islander people have to Country.

We also pay our respects to the cultural authority of Aboriginal and Torres Strait Islander people and their nations in South Australia, as well as those across Australia.

Minister's foreword

I'm delighted to present the *South Australian Government Climate Change Action Plan 2021–2025*.

This is a document of generational significance and shows how serious the Marshall Liberal Government is about continuing our state's powerful heritage in environmental leadership.

South Australia has had a goal since 2015 to reach net zero emissions by 2050, but in February 2020 our government announced an interim goal of a 50% reduction on 2005 emissions levels by 2030. We did this because we cannot rest on our laurels hoping for technological solutions to fall in our lap as we approach 2050. We need action now because that is what South Australians are demanding and it's the leadership that other states and nations have grown to expect and need from us, and because it's the right thing to do.

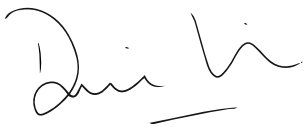
These twin 2030 and 2050 goals require a coordinated response across government, business and the community. The evidence suggests that the journey towards these targets will not be easy, but attaining them is certainly possible and, if planned and delivered in partnership with business, there is a high likelihood that they can lead to a long-term green jobs boom. I am confident that this will be the case.

Our Action Plan builds on South Australia's proud bipartisan pathway towards the decarbonisation of our economy. However, it is important to acknowledge that we have moved away from the outdated idea that addressing climate change is only achievable by the 'left' side of politics. Addressing climate change is beyond esoteric slogans and activist campaigns. It takes government leadership with the capacity to deliver real action through an intentional focus on tangible outcomes and a commitment to engaging with businesses and the market.

The renowned climate economist Professor Ross Garnaut has commended our approach and highlighted the opportunities for our state to prosper through low emissions industries and effective adaptation.

In the coming months and years the state government will continue our mission to reduce emissions and adapt to a changing climate. We'll do so in partnership with business and we'll bring our community along on the journey.

The *South Australian Government Climate Change Action Plan 2021–2025* outlines our roadmap to achieving this and I cannot wait to see it unfold.



The Hon. David Speirs, MP
Minister for Environment and Water

Contents

Executive summary

The South Australian government is focused on practical measures to address climate change that create jobs and growth, protect the environment and support community wellbeing.

This *South Australian Government Climate Change Action Plan 2021–2025* (Action Plan) describes government-led objectives and actions to help to build a strong, climate smart economy, further reduce greenhouse gas emissions, and support South Australia to adapt to a changing climate.

The objectives and actions have been informed by input from the Premier's Climate Change Council and other experts, including Professor Ross Garnaut.

The Action Plan identifies practical actions that government is taking now, as well as critical work that lays the foundations for further practical action, within and beyond the next five years. The actions will drive progress towards the objectives outlined in the Action Plan and towards the state's longer term emissions reduction and adaptation outcomes.

Implementation of the Action Plan will deliver the *Directions for a Climate Smart South Australia* that was released in December 2019 and drive further progress towards statewide goals of reducing greenhouse gas emissions by more than 50% by 2030 and achieving net zero emissions by 2050.

The government's work over the next five years will build on a strong base of achievement and existing government initiatives, and some examples and case studies related to this work are described in the Action Plan.

The South Australian government recognises that acceleration of South Australia's response to climate change will require leadership and action by governments, business and the community. This Action Plan provides a foundation for further engagement with these stakeholders on opportunities and measures to deliver a climate smart South Australia.

By implementing the Action Plan, the government is expecting to grow climate smart and low emissions industries, create new jobs and attract additional investment, particularly to regional areas.

The South Australian government will also remain open to new opportunities and actions arising from stakeholder engagement, innovation, advances in technology, and changing market demands.

The Premier's Climate Change Council, an independent advisory body to the South Australian government, will assist in monitoring and reviewing implementation.

The Action Plan is structured into seven focus areas that include key objectives and government-led actions for five years from 2021 to 2025. An overview of the focus areas and key objectives is provided in Figure 1. The actions are described in the main body of this Plan, with a summary table (Table A1) presented in Appendix 1.

South Australian Government Climate Change Action Plan 2021–2025

FOCUS AREAS	KEY OBJECTIVES
1 Clean energy transformation	• Accelerate the renewable energy economy • Develop a world-class renewable hydrogen industry
2 Climate smart economy	• Attract and grow businesses and industries powered by renewables • Support climate smart business innovation, risk management and growth • Develop a more circular economy • Develop a climate smart resources sector
3 Climate smart agriculture, landscapes and habitats	• Support the agriculture sector to adapt, innovate, and reduce net emissions • Support expansion of carbon farming and blue carbon • Ensure secure, climate resilient regional and urban water supplies • Build the climate resilience of landscapes, habitats and natural resources
4 Low emissions transport	• Support the uptake of low and zero emissions vehicles and fuels • Align transport and urban planning with low emissions transport outcomes • Increase the use of public transport and active travel
5 Climate smart built and urban environments	• Provide for development and design that is low emissions and climate resilient • Accelerate strategic urban greening • Understand and reduce climate change risks to infrastructure
6 Resilient communities	• Support communities and businesses to build resilience and adapt • Enhance climate change adaptation in emergency management and health services • Provide high-quality and accessible climate change science and information
7 Government leading by example	• Embed climate change risk and opportunity into government policy and practice • Accelerate work towards net zero emissions in government

Figure 1: Focus areas and key objectives to guide action.

Introduction

The South Australian government is committed to building a strong, climate smart future.

In 2019, the South Australian government released *Directions for a Climate Smart South Australia*[i], which sets the government's agenda for achieving the long-term outcomes of a more liveable and resilient state, low emissions jobs and growth, and net zero emissions by 2050.

To guide an orderly transition to a low emissions economy, South Australia has set an interim goal to reduce net emissions by more than 50% (from 2005 levels) by 2030. In addition, the government has an ambition to achieve 100% net renewable energy generation by 2030.

This *South Australian Government Climate Change Action Plan 2021–2025* (Action Plan) is the next step in the government's agenda to address climate change. The Action Plan sets out how the South Australian government will deliver on its climate smart policy directions and emissions reduction goals over the next five years.

Directions for a Climate Smart South Australia

Unlock innovation and economic opportunity
The state government will support the development of low emissions and climate smart industries and services in South Australia.

Reduce net emissions
The state government will lead an orderly and socially responsible transition to a low emissions economy.

Build resilience and adapt
The state government will support South Australian communities, industries, businesses and the environment to manage risk, harness opportunities, adapt and build resilience to climate change.

Provide accessible information
The state government will provide high quality, accessible information and build capacity for South Australians to respond to climate related risk and opportunity.

Government leading by example
The state government will embed climate risk and opportunity into government decision making and investment, and seek to achieve net zero emissions in government.

Outcomes

More liveable and resilient, climate smart state

Low emissions jobs and growth

Net zero emissions by 2050

South Australia's climate challenges and opportunities

South Australia is well placed to respond to the challenges and opportunities of climate change.

Our state's renewable energy leadership, skilled workforce, innovative businesses, strong research sector and abundant natural resources provide a strong base from which to meet the challenges of climate change and capture the opportunities from low emissions and climate resilient products, services and resources.

South Australians are faced with complex challenges due to climate change, including sea level rise, reduced average rainfall, intensification of storm events, and more frequent and severe heatwaves, bushfires and droughts. These changes are already being felt by South Australia's people, environment and economy. Average temperatures across the state are now warmer than in the past[ii] and are projected to rise to as much as 2.1 degrees Celsius above the long-term average by 2050[iii].

To minimise the impacts of a changing climate, governments, businesses and communities in South Australia and around the world are reducing emissions, transitioning their economies and adapting. This is shifting investment and demand towards low emissions and climate resilient goods, services and natural resources and away from emissions-intensive products.

South Australia will harness the international, national and domestic business opportunities, grow its exports and manage the risks to help drive sustainable economic recovery and long-term prosperity for South Australia.

It is clear that South Australia is in a good position to:

- use the state's abundance of sun, wind and other natural resources to take advantage of the global demand for low emissions goods and services
- achieve its ambition of 100% net renewable energy generation by 2030
- build on its green brand and reputation for innovation, which attracts new residents and investment
- adapt effectively to a changing climate
- harness the confidence of business to actively drive the innovation required for the next level of emissions reduction.

Expert advice, including from the renowned climate economist Professor Ross Garnaut, has helped inform the government's thinking about how to take advantage of South Australia's position.

Professor Garnaut's report, S*outh Australia's Climate Change Challenge and Opportunity*, provides a strong endorsement of South Australia's response to climate change and identifies priorities for the next phase of action.

The report highlights that South Australia can benefit economically by building on past success and redoubling efforts to leverage valuable opportunities in low emissions industries, carbon sequestration and adaptation. These opportunities include renewable energy generation and storage, low emissions manufacturing and mining, electrification of transport, increasing carbon storage in the land and sea, managing waste, and innovation in climate resilient agriculture.

'South Australia is better equipped to respond to the challenges and opportunities of climate change than any other Australian state and nearly all of the world's sub-national jurisdictions.'

Professor Ross Garnaut, September 2020[iv].

South Australia will become hotter and drier, with more frequent and intense extreme weather events

Higher temperatures

Maximum, minimum and average temperatures will continue to rise with more frequent hot days and longer warm spells.

More dangerous fire weather

There will be more days of severe and extreme fire danger and longer fire seasons.

Drier with more time in drought

Autumn and spring rainfall has decreased by up to 20% in some agricultural areas. Further reductions and more time in drought is projected.

Warmer and more acidic oceans

Oceans are becoming warmer and more acidic, affecting marine life.

Rising sea levels

Sea level is rising with a projected increase of up to 0.8 m by 2100. This will increase coastal erosion and flooding.

More intense heavy rainfall events

Heavy rainfall events will increase in intensity, increasing the risk of flooding.

Opportunities for South Australia

- Renewable energy generation and storage
- Low emissions industries and jobs
- Innovative, climate smart agriculture
- Managing waste (circular economy)
- Attract investment and people to SA
- Electric and hydrogen vehicles
- Business and community adaptation and innovation
- Increasing carbon storage

Emissions reduction progress and projections

South Australia can reduce greenhouse gas emissions and unlock innovation and economic opportunity.

South Australia recorded a 32% reduction in greenhouse gas emissions from 2005 to 2018 (financial years). The South Australian economy grew by 26% over the same period (see Figure 2).

Much of the state's emissions reduction has been driven by a transition to renewable energy. In 2019, 56.6% of South Australia's electricity was generated from renewable sources[v].

South Australia's emissions across the key economic sectors in the 2018 financial year are shown in Figure 3. In that year, South Australia emitted an estimated 24.2 million tonnes in net greenhouse gas (GHG) emissions across its economy after taking into account significant offsets from carbon stored in land and vegetation.

The pathway to net zero emissions by 2050 will require much more work from governments, business, communities and individuals, across all economic sectors. Only a modest reduction in emissions is projected if no further action is taken (Figure 4).

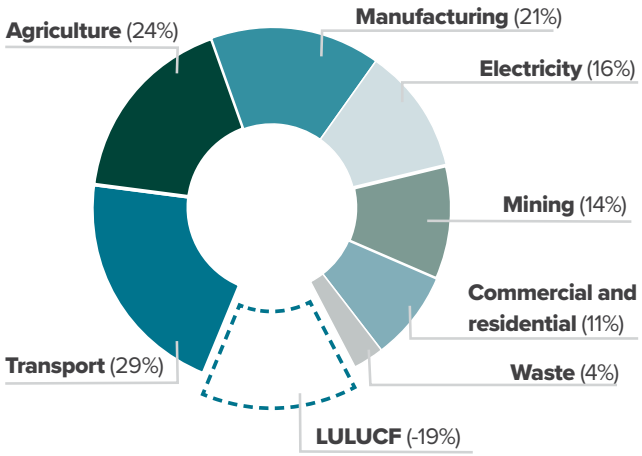


Figure 3: South Australia's 2018 financial year net greenhouse gas emissions profile[vi]. Positive values represent emission sources and negative values represent emission sinks. LULUCF refers to Land Use, Land Use Change and Forestry[1].

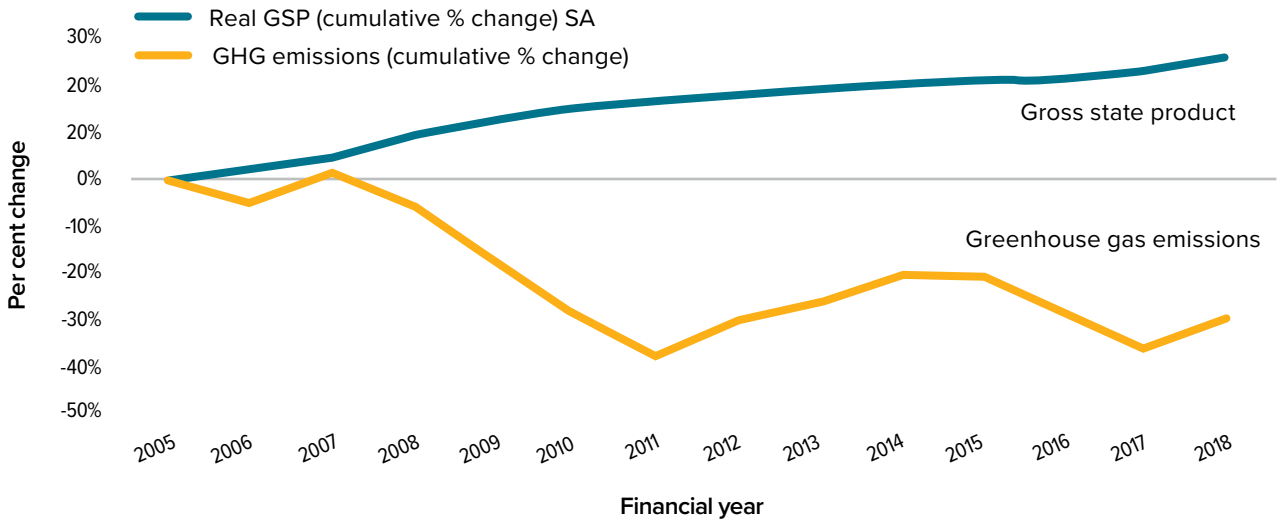


Figure 2: Per cent change in gross state product (GSP) compared to greenhouse gas emissions (2005–2018 financial years).

[1] The profile represents Scope 1 emissions, with emissions resulting from electricity purchased from the electricity grid and used by other sectors (Scope 2 emissions) included in the electricity sector.

A 50% reduction in net emissions by 2030 is within reach if emissions reduction efforts are scaled up. Major contributions will be needed in low emissions manufacturing and mining, renewable electricity and hydrogen, and in reducing emissions from transport and agriculture. While the scale of change will be challenging, these sectors have good prospects to expand and benefit economically from reducing emissions over the next decade.

Some of the key emissions reduction activities to achieve net zero emissions in South Australia include:

- fuel switching to renewable electricity and green hydrogen across the economy
- low emissions transport, including electric and hydrogen vehicles
- carbon storage in soils and vegetation in terrestrial and coastal environments
- carbon capture and storage from mining and industry
- energy efficiency in industries, businesses and households
- low or zero emissions construction materials and buildings
- improved livestock management to reduce methane
- waste minimisation and reuse.

Government, industries and businesses are increasingly focusing on these activities and additional opportunities will be facilitated under this Action Plan.

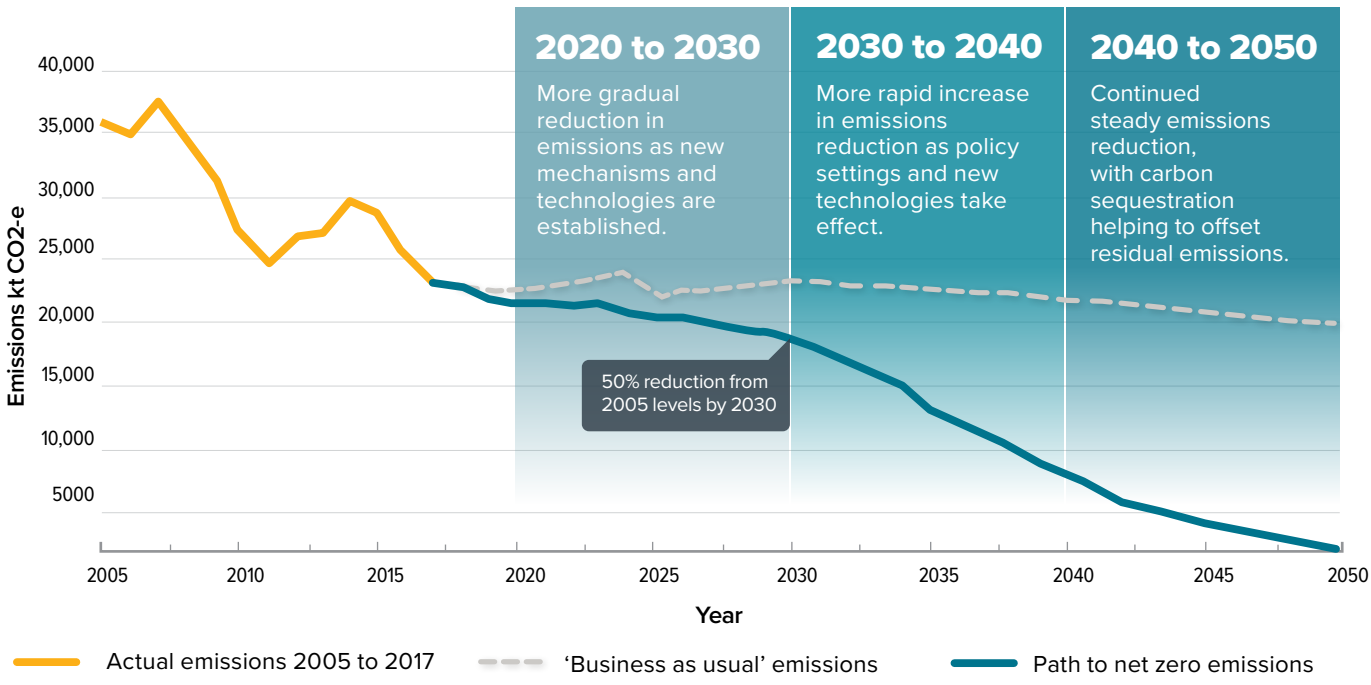


Figure 4: Emissions reduction pathway to achieve net zero emissions by 2050 compared to business as usual.


SA Water

The next phase of government action

South Australia has a strong history of action to address climate change and support low emissions economic development.

The Action Plan builds on this foundation and describes a comprehensive set of actions that reflects the priorities identified by Professor Garnaut as well as other areas in which the government will accelerate its efforts.

Transition to a low emissions economy

South Australia is well positioned to continue its transition to a low emissions economy.

The South Australian government will support the growth of renewable electricity and hydrogen industries, and lay the foundations for electrification of transport in the 2020s. This will support domestic and export growth that will help reduce emissions locally, in other Australian states, and overseas.

Renewable energy can help reduce emissions and lower costs across a range of economic sectors, including transport, agriculture, building and construction, mining and manufacturing. This can be leveraged into renewed global competitiveness, particularly in energy-intensive industrial processes.

Maintaining grid stability and reducing energy costs while expanding renewable energy generation, storage and transmission continues to be a priority for the South Australian government.

Key initiatives include:

- the world's largest per capita roll out of home battery storage, and installation of solar and home batteries on Housing SA properties as part of South Australia's Virtual Power Plant project
- investment in developing new energy storage technologies, such as the expansion of the Hornsdale Power Reserve (the 'big battery') near Jamestown
- fast-tracking a new interconnector between South Australia and New South Wales for energy security and the export of excess renewable energy
- work to align demand with periods of high renewable generation and make the most of distributed energy such as rooftop solar and smart appliances
- investment in a statewide electric vehicle charging network, and in smart charging for electric vehicles to reduce power and fuel bills and support the electricity grid.

Work is also underway to establish South Australia as a world-class renewable hydrogen supplier for export and domestic consumption.

The government will provide for low emissions development and create the environment to attract and grow low emissions manufacturing and mining.

The government is also taking steps to reduce South Australia's non-energy emissions. This includes exploring innovative ways to reduce livestock emissions, encouraging low emissions construction materials in government projects, and developing a more circular economy to reduce emissions from the production and use of materials and food, and from waste.

'The international economy is ready to deepen trade and investment with states that embrace the low-emissions transition, and regional South Australia would be one of the biggest beneficiaries from embracing new zero emissions opportunities.'

Professor Ross Garnaut, September 2020[vii].

Work is intensifying to support land managers to store carbon in the land, vegetation and marine and coastal environments. This includes pioneering blue carbon initiatives to store carbon in wetlands, mangroves and sea grass meadows, and facilitating carbon capture and storage.

The South Australian government will continue to take a lead by reducing its own emissions. The government's electricity supply contract will secure the construction of a 280 MW solar farm at Cultana near Whyalla and a 100 MW battery near Port Augusta. The government will also invest in energy efficiency in government buildings and a transition of the government fleet to electric vehicles. This will reduce emissions, create jobs and deliver savings to taxpayers.

These priorities are reflected in this Action Plan. Other areas for action will be identified as the South Australian government continues to work with other governments, business and communities to support greater uptake of mature emissions-reduction technologies and approaches and to facilitate the next wave of innovation.

Adaptation

Adapting to the changing climate is essential for the state's future prosperity and liveability.

Some changes to our climate are now inevitable, regardless of the emissions reduction activities that are implemented. Adapting to this changing climate is essential to ensure our environment, businesses and communities have the resilience to cope with the changes. Adapting well will support the state's ability to compete globally and meet growing demand for sustainable, climate smart goods and services.

South Australia has a long history of adaptation driven by the South Australian government as well as by business, communities, local governments and other organisations.

Under this Action Plan, the South Australian government will build on its achievements and deliver practical outcomes that include:

- urban greening and water sensitive urban design to create greener, cooler and more liveable neighbourhoods
- securing the future of our coastal environment against increased coastal erosion and flooding
- reducing risk and building resilience in the face of more frequent and severe bushfires, storms, floods and heatwaves
- working with local government and other regional organisations to deliver local adaptation actions such as urban heat and tree canopy mapping, coastal hazard risk mitigation, and sustainable agriculture projects
- working with primary producers on practical adaptation measures, including development of climate resilient crops and farming methods.

The government will also bring greater focus to water security; support business innovation, risk management and new business opportunities; adapt emergency management and health services for future demands; plan for more resilient built and urban environments; and build resilience in communities, landscapes, habitats and natural resources.

Support for climate science, research and development, and the provision of high quality climate science and information to help business and communities understand climate change risk and adapt, will continue to be a priority. Implementing the *Climate Change Science and Knowledge Plan for South Australia* will deliver the data and information required to address climate change response planning.

The Action Plan

The South Australian government is focused on practical measures to address climate change.

The Action Plan identifies practical actions that we are taking now, as well as critical work that lays the foundations for further practical action, within and beyond the next five years.

Under the Action Plan, the South Australian government will align its climate change response with its plans for economic recovery and growth, particularly with opportunities to produce low emissions goods and services to meet global market demands.

By delivering the Action Plan, the government is expecting to grow low emissions industries, create new jobs and attract additional investment, particularly to regional areas.

The Action Plan integrates other strategic initiatives guiding climate change action, such as *South Australia's Hydrogen Action Plan,* the *Climate Change Science and Knowledge Plan for South Australia, Stronger Together: South Australia's Disaster Resilience Strategy 2019–2024*, *South Australia's Electric Vehicle Action Plan*, and the state's waste strategies.

The South Australian government recognises that acceleration of South Australia's response to climate change will require leadership and action by governments, industries, businesses and the community. Importantly, the government will work to create a business environment that drives market-led opportunities.

The Action Plan provides the foundation for further engagement and partnerships outside government. The South Australian government will remain open to new opportunities and actions arising from this stakeholder engagement and from innovation and advances in technology.

1. Clean energy transformation

South Australia's growing renewable electricity sector and developing hydrogen industry support climate smart jobs and growth and will provide the cornerstone for a low emissions economic transition.

Key objectives:

- Accelerate the renewable energy economy
- Develop a world-class renewable hydrogen industry

Accelerate the renewable energy economy

South Australia has world-class renewable energy resources, including abundant wind resources and outstanding solar capacity. As a result of government policies and initiatives, South Australia is now at the forefront of renewable energy innovation.

Renewable energy will support change in other economic sectors, for example by powering electric vehicles, driving low emissions industrial processes such as green steel production, and providing opportunities to switch to low emissions energy and fuels in the mining, transport, building and construction, and domestic sectors.

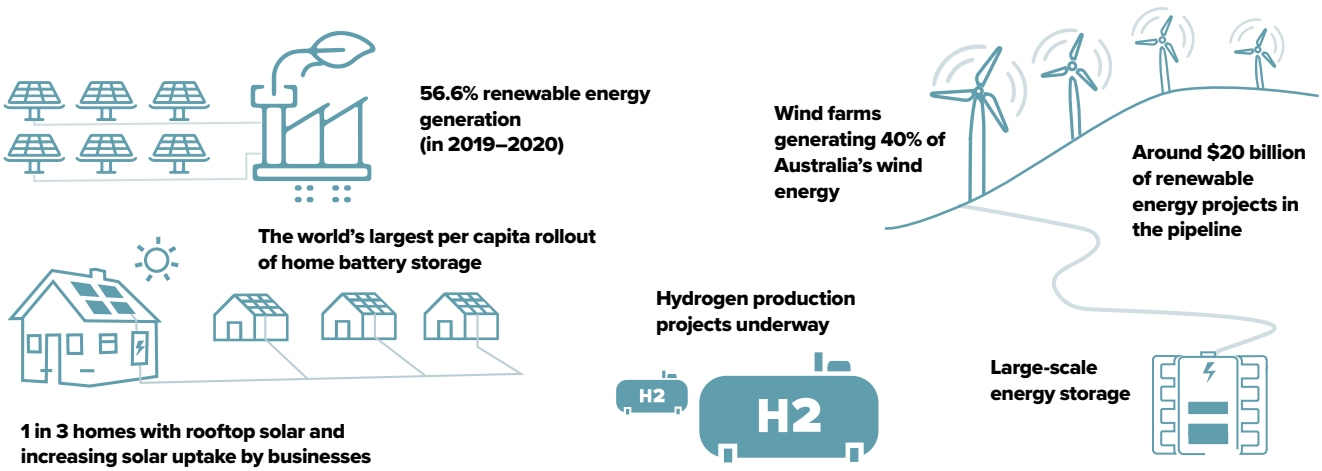
Developing the state's renewable energy industry provides opportunities for export, attracting investment and growing existing and new businesses. For example, advances in renewable electricity and hydrogen make our state increasingly attractive to energy-intensive industries seeking to reduce their emissions footprint and their energy costs. Likewise, the expertise and new energy technologies developed in South Australia can also be exported interstate and overseas.

The government will continue to work with industry and energy market operators to get the renewable electricity supply mix right and to support grid stability and economic growth.

New technologies, markets and opportunities for investment by governments and the private sector are likely to emerge over the next five years. The South Australian government will remain open to these opportunities and will build on its actions as needed.

South Australia's transformation to a net zero emissions economy and a national and international exporter of clean energy could mean achieving a level of renewable energy that is more than 500% of current local grid demand by 2050.

South Australia currently has ...



Actions 2021–25

1.1.	**Drive the continued development of renewable energy and energy storage**	The government will continue to unlock investment in, and support growth of, renewable electricity generation and storage, to enable South Australia to become a 100% net renewable energy generator by 2030.
1.2.	**Fast-track construction of a new South Australia to New South Wales high capacity electricity interconnector**	The government is fast-tracking a new interconnector between South Australia and New South Wales to improve energy security, enable increased energy export and facilitate the transition to low emissions energy sources.
1.3.	**Implement *South Australia's Energy Solution***	The government will implement the critical energy and smart technology actions in *South Australia's Energy Solution* to allow South Australians to move to secure and affordable 100% net renewable energy. This will allow rooftop solar to increase substantially while addressing grid security and resilience.
1.4.	**Implement energy demand management and productivity programs**	The government will implement a range of policies and projects to manage electricity demand and improve energy efficiency to align with wind and solar generation and new modes of energy storage and to reduce costs. This includes the *Retailer Energy Productivity Scheme* that sets annual targets for energy retailers to deliver energy productivity activities to households and businesses from 2021.
1.5.	**Increase renewable electricity generation in remote communities**	Renewable energy will be integrated into the *Remote Area Energy Supply Scheme,* to reduce diesel consumption and emissions and to ensure a safe, reliable and cost-effective supply is available in remote South Australian towns.

CASE STUDY: Bungala Solar Power Project, Port Augusta

The Bungala Solar Power Project is located on land owned by the Bungala Aboriginal Corporation near Port Augusta. With capacity of 275 MW, it is one of Australia's largest solar photovoltaic (PV) projects. Around 1500 people participated in its construction, including around 70 Indigenous participants in an Indigenous training and employment program.

Develop a world-class renewable hydrogen industry

South Australia has the wind and solar resources, and the infrastructure and skills, to become a world-class renewable hydrogen supplier.

When hydrogen is used as a fuel, it releases no greenhouse gas emissions or air pollutants. Therefore, hydrogen produced using renewable energy provides a zero emissions fuel that can be used for electricity generation, as a natural gas replacement, and for road, rail and shipping transport. Renewable hydrogen can also be used to make low-carbon (green) steel and other products and to produce renewable chemicals, such as ammonia for the agricultural and mining sectors.

By 2050, it has been estimated that an Australian hydrogen industry could contribute $11 billion and 7600 jobs to the national economy[viii]. Many of these jobs could be located in regional areas in South Australia, especially around ports and existing industrial clusters where future hydrogen development is most likely to occur.

In 2019 the South Australian government released *South Australia's Hydrogen Action Plan* to scale up renewable hydrogen production for export and domestic consumption. Local use of renewable hydrogen in homes, transport and industry will play an important role in helping South Australia achieve its emissions reduction goals.

Some current initiatives:

- A landmark hydrogen export study, online modelling tool and prospectus have been completed to develop international-scale clean hydrogen export.
- The government has co-invested in the Australian Hydrogen Centre to drive research and development on hydrogen generation, distribution and use.
- The government is co-investing in renewable hydrogen production projects to help establish the industry.

Actions 2021–25

1.6.	**Implement *South Australia's Hydrogen Action Plan***	The government will facilitate investment in hydrogen infrastructure, establish a world-class regulatory framework, deepen trade relationships, foster innovation and workforce development, and integrate hydrogen into our energy systems.

CASE STUDY: Renewable hydrogen for domestic and industrial use

Hydrogen Park South Australia is an $11.4 million demonstration facility, located at the Tonsley Innovation District. The facility currently has the largest electrolyser in Australia and will produce renewable hydrogen to blend with natural gas for supply to more than 700 properties in the nearby suburb of Mitchell Park, and to supply industrial customers.

2. Climate smart economy

South Australia, particularly regional areas, can prosper by further developing low emissions and climate resilient technologies, industries and businesses.

Key objectives:

- Attract and grow businesses and industries powered by renewables
- Support climate smart business innovation, risk management and growth
- Develop a more circular economy
- Develop a climate smart resources sector

Attract and grow businesses and industries powered by renewables

South Australia's clean energy transformation will make our state increasingly attractive to energy-intensive industries seeking to reduce their emissions footprint. It gives our state a competitive advantage by reducing electricity costs and supporting positive branding around our low emissions society and economy.

These factors will benefit a range of industries, including steel production, minerals processing, and agriculture and food production. The capabilities that South Australia develops in clean energy technology, skills, training and services can also be exported interstate and overseas.

Actions 2021–25

2.1.	**Support the growth and attraction of businesses and industries powered by renewables**	The government will provide investment attraction initiatives and policy settings to encourage investment in, and development of, energy-intensive industries, technology manufacturers and renewable energy services, and enable greater value-adding in other export sectors such as mining, food and agribusiness.

CASE STUDY: Regional development driven by renewables

Renewable energy has transformed the economic fortunes of the Upper Spencer Gulf region. Steel manufacturing, lead and metal smelting, and mining industries connected to the region are increasingly factoring renewable energy into their operations and planning. In 2020, the region had 817 MW of large-scale renewable and storage projects, with more projects in the pipeline.

Support climate smart business innovation, risk management and growth

South Australian businesses and industries across all sectors, from agriculture and energy, manufacturing and construction, through to insurance and finance, will increasingly need to manage the risks and capitalise on the economic opportunities of climate change to remain competitive.

Businesses and industries will need to adapt to the physical impacts on their operations and supply chains from a hotter and drier climate and more frequent extreme weather events. They will also need to respond to consumers, investors and regulators that are increasingly making decisions that consider how well companies address climate change risk and emissions reduction.

To support a strong, climate smart economy, the South Australian government will integrate climate change considerations into its economic policies, including its *Growth State Plan*.

The government also has an important role in supporting industry development and business resilience, including training and skills development and support for innovation and research.

Engagement with business and industry will be undertaken to identify additional opportunities, partnerships and industry-led actions to manage climate risk, reduce emissions and harness new business opportunities.

Some current initiatives:

- Innovation districts, such as Lot Fourteen, Tonsley, Waite and Mawson Lakes, support clean-technology innovation.
- The government has partnered with the University of Adelaide to demonstrate and encourage early adoption of new climate smart agriculture technologies.
- The Carbon Neutral Adelaide Partner Program supports participating businesses and individuals to reduce emissions.

Actions 2021–25

2.2.	**Integrate climate smart thinking into sector strategies and South Australia's *Growth State Plan***	Strengthen the integration of climate smart considerations into government's work with businesses and industries to ensure sector strategies and the *Growth State Plan* address climate related economic opportunities and risks.
2.3.	**Coordinate delivery of climate smart business engagement**	The government will work with targeted industry sectors to identify partnerships and additional industry-supported initiatives that will help businesses to manage climate risk, reduce emissions and harness new business opportunities.
2.4.	**Support research and development to deliver new climate smart innovation**	The Office of the Chief Scientist will collaborate with the Department for Environment and Water and other agencies to support climate smart industry and research collaborations, such as new cooperative research centres and other scalable research capability for South Australia.
2.5.	**Support the development and commercialisation of innovative climate smart products and services**	The government will provide support for entrepreneurs and startups that produce low emissions and climate adaptation products and services through the Research, Commercialisation and Startup Fund, the *Future Industries Exchanges for Entrepreneurship (FIXE) Strategy* and other relevant programs.
2.6.	**Support development of renewable energy and climate smart industry training products and pathways**	The government will work with industry to develop training products, skills training and qualifications to meet emerging needs in renewable and climate smart industries. This includes considering opportunities for government subsidised training and building capacity of local training organisations.
2.7.	**Work with *Environment Protection Act 1993* licensees to understand climate change risk and liabilities and enable adoption of risk management strategies**	The Environment Protection Authority will assist licensees exposed to climate related risk by reviewing license conditions and supporting action to improve arrangements for dealing with more frequent extreme weather events.
2.8.	**Grow the South Australian water industry as a local and global supplier of innovative water solutions**	The government will partner with the state's water sector to build the capacity to provide new solutions that address water constraints to growth across the economy and capture new export and investment opportunities.

CASE STUDY: Using biogas to power beef processing

Teys, a South Australian beef processor and exporter, is capturing biogas from the anaerobic digestion of wastewater to generate renewable electricity for onsite use at its Naracoorte plant. The project, which was supported by a grant from the South Australian government, has reduced energy costs and carbon emissions and increased site energy security.

Develop a more circular economy

A circular economy, which keeps material resources in use or 'circulating' for as long as possible, provides enormous potential to improve resource use efficiency, boost jobs and growth and reduce emissions across most economic sectors.

Transitioning to a circular economy will maximise the use of existing materials, reduce dependence on new raw materials and reduce waste.

Green Industries SA estimates that developing a more circular economy by 2030 could create an additional 25,700 full-time jobs and save around 7.7 million tonnes of greenhouse gas emissions (measured in carbon dioxide equivalent)[ix].

South Australia is in a unique position to transition to a circular economy as it is a recognised national and international leader. South Australia leads the nation in container deposit legislation and in banning plastic bags and single use plastic items. The state has the highest rate of diversion from landfill of any Australian state or territory and has an exemplary organics recycling industry.

The government will continue to deliver circular economy initiatives that help grow jobs and reduce emissions.

Some current initiatives:

- In 2020, South Australia passed legislation to ban single use plastic products.
- Road upgrades between Regency Road and Pym Street have used around 3000 tonnes of Downer's road surfacing material Reconophalt, containing 2.4 million plastic bags, and around 71,000 used toner cartridges.
- Green Industries SA's Commercialisation of Innovation Program provides grants to stimulate investment in innovative technologies in waste management and the circular economy.

Actions 2021–25

2.9.	**Support business and communities to adopt circular economy practices**	Green Industries SA will work with other government agencies on education, engagement and incentives to encourage businesses, schools and the community to implement circular economy opportunities and boost sustainable growth and resource security.
2.10.	**Implement *South Australia's Waste Strategy 2020–2025***	*South Australia's Waste Strategy 2020–2025* outlines a range of actions that will help reduce emissions by increasing recycling and resource reuse and reducing methane from landfills.
2.11.	**Implement *South Australia's Food Waste Strategy***	*South Australia's Food Waste Strategy* will be implemented to capture and divert 50% of household and business food waste from landfill into higher-value uses, such as compost. This will keep this material circulating back into natural systems and reduce emissions in the form of methane.
2.12.	**Deliver a stronger regulatory framework to reduce waste and encourage greater reuse of materials to support a circular economy**	The Environment Protection Authority will establish and implement a range of new and enhanced regulatory measures, such as material flow reporting and stockpile controls, to encourage businesses and industries to reduce waste, improve resource recovery and keep materials in use for longer.

CASE STUDY: Circular economy innovation

The circular economy can be seen in the work of companies Holla-Fresh and Bio Gro, located in the south-east of South Australia. Horticulture company Holla-Fresh heats its greenhouses using low-cost, renewable energy from pyrolysis of crop and timber wastes. Local company Bio Gro provides the wood residue at no cost. After pyrolysis, biochar (charcoal) is produced, which is collected by Bio Gro before use as a soil improver that helps to store carbon.

Develop a climate smart resources sector

Many resources companies are now exploring ways to improve their sustainability and reduce emissions. Excellence in environmental performance that meets investor and social expectations can improve efficiency and productivity and provide a source of competitive advantage for companies.

There are opportunities for the resources sector (and other heavy industries) to reduce emissions, generate carbon offsets and improve production through large-scale carbon capture and storage (CCS). CCS enables carbon dioxide from large point sources to be captured and deposited where it cannot enter the atmosphere, such as in underground geological formations.

There are also increasing opportunities to supply the minerals required for low emissions technologies, such as solar panels, batteries, electric vehicles and electronics. The South Australian resources sector is well placed to meet growing demand for copper, magnetite, silver and gold. Economic benefits can be multiplied by attracting and developing value-adding industries, such as mineral processing operations that can be powered by renewable energy.

The government will engage with the resources sector to investigate climate change risk, support discovery of technology minerals and provide a policy and investment framework to facilitate CCS.

Some current initiatives:

- The government is collaborating with OZ Minerals and five research and innovation organisations to investigate opportunities to optimise electrical and fuel demand and integrate renewable energy systems on mine sites.
- South Australia has contributed to the development of international standards for carbon capture and storage.
- The government's *Accelerated Discovery Initiative* supports co-funding for the discovery of new minerals, including those in demand for low emissions technology.

Actions 2021–25

2.13.	**Develop and implement policies to facilitate investment in large-scale carbon capture and storage**	Work will be undertaken with industry to develop and implement policies, standards and regulations to facilitate and provide investment incentives for carbon capture and storage. The government will promote the potential for carbon capture and storage projects in South Australia.
2.14.	**Develop projects and strategies to facilitate the discovery of minerals that support technology and a low emissions economy**	The government will develop and implement projects and strategies that facilitate the discovery in South Australia of minerals that support technology and a low emissions economy.
2.15.	**Investigate climate change regulatory risk that may apply to the minerals sector in South Australia**	The government will undertake a review to understand climate change hazards and potential risk scenarios, including consideration of resilience and climate change adaptation, which may apply to the minerals sector in South Australia.

CASE STUDY: Moomba carbon capture and storage

Santos is working on a project to capture carbon dioxide from its Moomba processing plant and inject it deep underground into depleted gas reservoirs where it can be safely and sustainably stored for millions of years. The Moomba carbon capture and storage project will be the second largest dedicated carbon capture and storage project in the world, targeting the capture of 1.7 million tonnes per year of CO_2.

3. Climate smart agriculture, landscapes and habitats

Climate change presents challenges to the sustainability and productivity of agriculture, water resources, natural and urban landscapes, and habitats. It also presents opportunities to capitalise on new markets, build increased resilience and sustain prosperity.

Key objectives:

- **Support the agriculture sector to adapt, innovate, and reduce net emissions**
- **Support expansion of carbon farming and blue carbon**
- **Ensure secure, climate resilient regional and urban water supplies**
- **Build the climate resilience of landscapes, habitats and natural resources**

Support the agriculture sector to adapt, innovate, and reduce net emissions

Food, wine and agribusiness is an important driver of South Australia's economy. It is a diverse sector covering primary production, forestry, fishing, aquaculture, processing of raw material, and manufacturing of food, beverage and fibre products.

Adapting effectively as the climate changes and responding to market demand for climate smart products will improve the sector's competitive advantage, and contribute to economic growth and regional development.

Primary producers and agribusinesses have opportunities to adapt, diversify and grow, through new technologies and farming methods, climate resilient crops and livestock, meeting increased demand for low emissions products, and participating in carbon markets. Similarly, increased uptake of renewable energy and more resource-efficient farming can lower production costs.

Agriculture can make a valuable contribution to reducing South Australia's greenhouse gas emissions. Agricultural production contributed 24% of South Australia's emissions in the 2018 financial year (Figure 2), with major sources of emissions being cattle, sheep and agricultural soils (including fertiliser application).

Low emissions farming approaches are emerging that can improve productivity and access to new markets and support regional development. For example, carbon farming that involves improvement of soils, establishment of trees or regeneration of native plant species can improve productivity and can produce carbon credits that may be traded. Similarly, reducing methane production from livestock, through feed supplements or other technologies, can help improve livestock productivity and respond to a growing demand for low emissions food.

Other opportunities exist in using biomass—such as waste from agricultural crops, livestock, wood and wood processing, and also food waste—to produce soil improvement products, bioplastics and energy.

South Australia's primary producers and agribusinesses are experienced in adapting to a variable climate and market conditions and many already consider long-term climate related risk in their business planning and practices. Building on this foundation, the government will work with the sector to understand and support opportunities for adaptation, emissions reduction, carbon farming and new climate smart growth opportunities.

Some current initiatives:

- The South Australian Research and Development Institute works with industry to develop climate resilient crops and farming methods, such as helping wine makers to adapt to warmer vintages and assisting grain growers to match maturation of crops to changing weather patterns.
- Climate vulnerability assessments have been undertaken for the viticulture, horticulture, annual cropping, livestock and dairy industries in the Mount Lofty Ranges.

Actions 2021–25

3.1.	**Identify and develop climate smart aquaculture opportunities**	The government will work with industry to investigate and support industry development in new aquaculture opportunities, such as new climate resilient fish species and commercial-scale seaweed for feed supplements to reduce livestock methane emissions.
3.2.	**Identify opportunities for commercial development and use of biomass**	The government will collaborate with industry stakeholders and Regional Development Australia Boards to identify and support development of opportunities for using biomass—such as agricultural and wood waste—for soil improvement, bioenergy and other industrial uses.
3.3.	**Support primary producers in adaptation planning, reducing net emissions and identifying economic opportunities**	The government will engage with primary producers, industry peak bodies and key stakeholders on climate related risks and opportunities, provide relevant information and connect them to opportunities that will support climate resilience, adaptation and net emissions reduction.
3.4.	**Implement enhanced biosecurity surveillance and reporting**	The government will strengthen South Australia's capability for early detection and response to altered pest and disease risks as a result of the changing climate.

CASE STUDY: Using seaweed to reduce livestock emissions

The South Australian government is working with CH4 Global and the Commonwealth Fisheries Research and Development Corporation to explore commercial production of a species of seaweed that, when processed and added to feed, can reduce livestock methane emissions by 80% or more and reduce feed requirements, with no effect on productivity.

Support expansion of carbon farming and blue carbon

A wealth of carbon farming and blue carbon opportunities exist across the state. Increasing carbon stored in vegetation, soils, and marine and coastal environments ('blue carbon') and reducing livestock emissions will make a significant contribution to reducing the state's net emissions. A fifth of South Australia's total emissions is already offset through carbon stored in vegetation and soils on land and in coastal environments.

Projects that reduce emissions or increase carbon sequestration can generate carbon credits that may be sold to emitters seeking to offset their emissions. The carbon credits can provide alternative revenue sources for landholders and land managers, including Aboriginal communities. Delivering carbon farming and blue carbon projects can generate regional jobs.

Co-benefits can also be significant and include improved agricultural productivity, sustainable land management, and restoration of natural habitats, including marine and coastal environments, which are important for recreational and commercial fisheries.

To expand South Australia's carbon farming and blue carbon industries, the South Australian government will work with land managers, farmers, other governments and researchers to identify and develop the opportunities, address barriers to uptake, and increase capacity to attract investment.

Some current initiatives:

- Soil improvement trials undertaken by the Department of Primary Industries and Regions, such as adding clay to sandy soils, have shown potential to sequester carbon and significantly improve productivity.
- Carbon credits generated from the River Murray Forest established by the state government and Greening Australia have been purchased by organisations seeking to offset their carbon emissions.
- The government has mapped organic carbon levels for different soil textures, climate zones and agricultural districts, to inform priority areas for future soil carbon projects.

Actions 2021–25

3.5.	**Implement the *Blue Carbon Strategy for South Australia***	The *Blue Carbon Strategy for South Australia* will deliver practical actions and research to help land managers and investors to establish blue carbon projects to store carbon and protect and restore marine and coastal environments.
3.6.	**Support uptake of carbon farming opportunities**	The government will develop and implement a *Carbon Farming Roadmap* to identify opportunities and remove barriers to uptake of emissions reduction and carbon sequestration opportunities in soils, vegetation, forestry and livestock management.
3.7.	**Develop carbon sequestration opportunities on conservation land**	This initiative will facilitate carbon offset opportunities through regeneration and planting of native vegetation on national parks and reserves to offset emissions and enhance conservation outcomes.

CASE STUDY: Tidal reconnection for blue carbon

The Salt to C project undertaken by the Goyder Institute for Water Research is the first study in Australia to investigate the effects of tidal reconnection of a salt pond for carbon capture. The project found that restoration of salt fields through tidal reconnection leads to a net gain in soil carbon and rapid revegetation.

Ensure secure, climate resilient regional and urban water supplies

Water is the state's most precious resource, and securing suitable regional and urban water supplies is essential for economic growth, critical human needs and adapting to climate change.

Climate change impacts on rainfall and stream flows combined with increasing demands for water will place greater pressure on this resource. This makes it important to plan for, manage and develop all potential water resources and consider the water infrastructure needed to secure sustainable supplies into the future.

South Australia is already a leader in using stormwater, wastewater recycling and desalinated water to diversify from more traditional sources of water. Future opportunities include increasing access to and use of these alternative sources, treating and using lower quality groundwater, developing new supply and storage infrastructure, and improving water use efficiency and demand management.

The government will ensure that the greater variability in water availability as a result of climate change can be managed and that sustainable development of all viable sources of water to support growth and urban greening is optimised. Integrated management that includes stormwater and drainage systems will also minimise flood risk.

Long-term water security planning for regional and urban areas will be undertaken in collaboration with local government, primary producers and other stakeholders. The government is also working with other Australian jurisdictions to improve management of the River Murray and to develop a national approach to addressing climate change risk in water resource planning and management.

Some current initiatives:

- Facilitation of stormwater harvesting and use means the state's capacity to harvest stormwater is continually increasing, with 4.5 GL of stormwater captured and stored for reuse in the 2019 financial year.
- SA Water is working with councils and schools to use sensors and irrigation scheduling software to optimise water use. Implementation of this technology could allow a 30% increase in the area of irrigated public open space without additional water use.

Actions 2021–25

3.8.	**Increase climate resilient water supplies, water reuse and efficient use of water**	SA Water will expand climate resilient water supply options through the development and delivery of fit-for-purpose water from sustainable sources and innovations in water efficiency.
3.9.	**Undertake water security planning for priority regional areas**	The government will work with stakeholders and local communities to develop targeted water security strategies for key water resources or priority growth industries where water demand has potential to exceed supply. Strategies will consider opportunities for new or augmented supplies from all viable water sources and for the use of new water technologies.
3.10.	**Develop a framework to deliver integrated urban water management and inform investment decisions**	The government will develop an *Integrated Urban Water Management Framework* for all viable urban water sources. The framework will underpin management and investment decisions to meet community and economic growth needs in a hotter, drier future. The work will consider urban greening needs and stormwater management to minimise flood risk.

CASE STUDY: Leading the way in wastewater recycling

Around one third of South Australia's treated wastewater is used for agriculture and urban parklands. For example, recycled water from the Bolivar wastewater treatment plants is used for high-value intensive food production in the Northern Adelaide Plains, and water from the Glenelg Wastewater Treatment Plant is used to irrigate over 163 hectares of the Adelaide Park Lands.

Build the climate resilience of landscapes, habitats and natural resources

The sustainable management of our landscapes, habitats and natural resources is vital for the survival and growth of our economy, wellbeing and way of life.

The changing climate will adversely affect vulnerable landscapes, ecosystems and the resources they provide. Sea level rise and more frequent and intense storms will increase the risk of coastal flooding and erosion. Changes in temperatures and rainfall patterns and more frequent and severe bushfires, droughts, storms and floods will alter where species occur and cause local losses in some species. As a result, ecosystem services such as crop pollination and water quality maintenance may also be altered.

Increasing habitat resilience and strengthening conservation efforts will be critical to support healthy plants, animals and ecosystems. South Australia has a long history of environmental and natural resources management on public and private land from which to build to meet these challenges.

South Australia's protected area system encompasses public, private and Aboriginal lands and covers around 30% of the state. Heritage Agreements have been established with more than 2800 landholders. The South Australian government is investing significantly in the revitalisation of the state's protected area system and the parks and wildlife service to ensure that these natural assets continue to form the core of a broader landscape approach to conserving biodiversity and protecting natural habitats against the impacts of climate change.

Recent natural resources management reforms have established regional landscape boards with a strong focus on supporting resilient landscapes and sustainable primary production under a changing climate. Regional landscape plans and a new state landscape strategy will take into account best available climate science information and ensure practical on-ground regional action is coordinated with state-level strategic directions for resilient landscapes, including the need for climate change mitigation and adaptation.

The South Australian government and regional landscape boards will continue to work with landholders and land managers to improve knowledge of how landscapes, ecosystems and biodiversity respond to climate change and to support effective management actions.

Some current initiatives:

- The *Landscape South Australia Act 2019* expressly recognises the significance of climate change in managing landscapes and natural resources, including the need for both mitigation and adaptation.
- Projects such as *New Life for our Coastal Environment* and *Securing the Future of our Coastline* address climate change risks by stabilising beaches, restoring sea grass meadows, and supporting research on protecting coastal environments.
- The government has revitalised Heritage Agreement funding to help landholders and farmers to conserve and protect native vegetation and increase biodiversity.
- Projects to reinstate more natural flow regimes for Fleurieu Peninsula swamps will help ensure the long-term prospects of the wetlands as the climate changes.

Actions 2021–25

3.11. Develop a climate smart, long-term coastal strategy	Work will be undertaken to assess risks to key coastal assets, human settlements and coastal environments under a changing climate and to develop a long-term *Coastal Strategy for South Australia*.
3.12. Assess the implications of climate change for South Australia's ecosystems to inform critical adaptation strategies	Work will be undertaken to identify the critical climate change impacts for ecosystems, particularly those affecting conservation and primary production. This will inform practical adaptation strategies for regional landscape planning and protected area management.
3.13. Develop and apply a dynamic biodiversity fire management planning tool for conservation outcomes	A *Biodiversity Fire Planning Tool*, incorporating climate change forecasts, will be developed to support the strategic use of fire to maintain biodiversity while reducing fuel loads and the risk of bushfires to life and property. The tool will initially be developed for the Kangaroo Island, and Hills and Fleurieu landscape regions.
3.14. Landscape planning will consider climate change mitigation and adaptation for natural resources and landscapes	Development of the *State Landscape Strategy* and *Regional Landscape Plans* will take into account best available climate science and recognise the need for mitigation and adaptation in management of natural resources.

CASE STUDY: Informing coastal adaptation

A new interactive Flood Mapping Tool helps identify and map areas on Eyre Peninsula and the Limestone Coast that may be vulnerable to coastal flooding due to storm surge and/or sea level rise. The tool will be used to inform the most appropriate adaptation strategies, such as avoid, retreat, accommodate or do nothing. The project is a partnership between landscape boards and state and local governments.

4. Low emissions transport

A modern, low emissions transport system will improve productivity, reduce congestion and improve air quality as well as reduce greenhouse gas emissions.

Key objectives:

- **Support the uptake of low and zero emissions vehicles and fuels**
- **Align transport and urban planning with low emissions transport outcomes**
- **Increase the use of public transport and active travel**

Our transport system plays a fundamental role in supporting the state's economy, our quality of life and the liveability of our cities and towns.

Transport was the largest direct source of emissions for South Australia in the 2018 financial year, contributing 29% of total emissions (Figure 2). Road transport contributes most (87%) of the emissions, with the remainder being from shipping, railways, aviation and other transport modes. There are also emissions associated with the construction and operation of transport infrastructure, and these are accounted for separately.

Developing a modern, low emissions transport system will also improve transport efficiency and productivity and reduce congestion and pollution. Achieving this outcome requires a combination of behaviour changes and technological innovation to shift to low and zero emissions vehicles and fuels, reduce transport demand and improve transport efficiency (Figure 5).

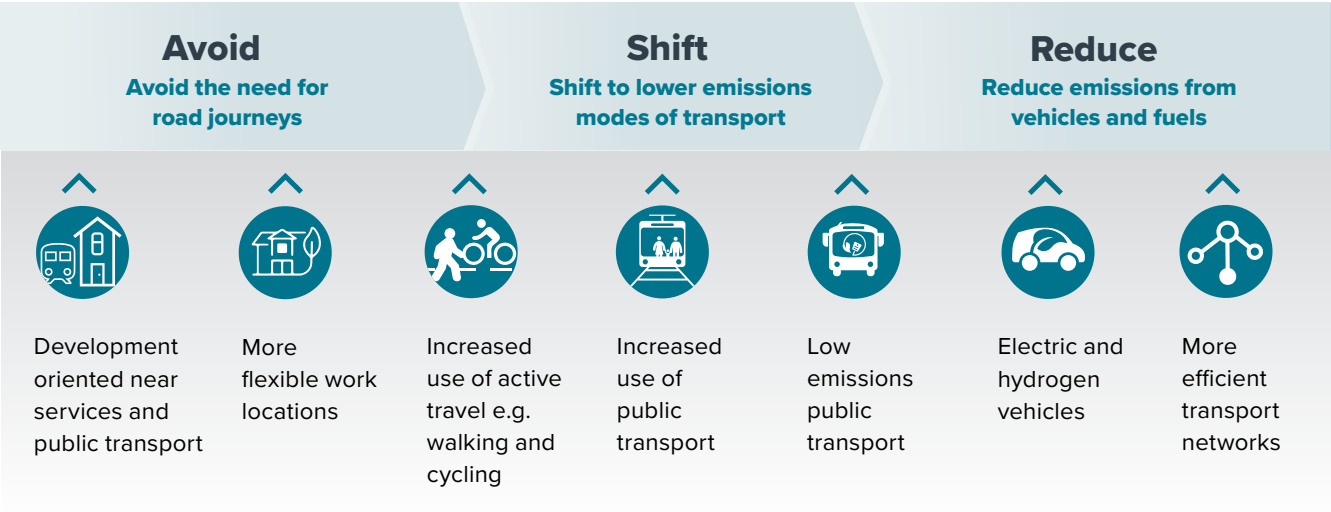


Figure 5: Key elements of a low emissions transport system.

Support the uptake of low and zero emissions vehicles and fuels

Low and zero emissions vehicles, such as plug-in electric and hydrogen-powered vehicles, provide a significant opportunity to reduce transport emissions. Global sales of electric passenger vehicles are growing as technologies improve, costs reduce and countries announce plans to ban diesel and petrol vehicles. The shift to low emissions fuels, including hydrogen, is also spreading to heavy transport such as trucks and buses.

Battery and hydrogen electric vehicles are likely to be cheaper to run and maintain, lowering the costs of transport for businesses and households. There are economic opportunities in the manufacture and recycling of batteries, electric vehicles and their components, and in low emissions fuels such as hydrogen.

When integrated with electricity networks, the storage capacity of electric vehicles, combined with the capability to schedule their charging times, can help to stabilise the grid during peak demand and across periods of renewable energy generation.

South Australia's Electric Vehicle Action Plan aims to reduce barriers to the uptake of battery and hydrogen fuel cell electric vehicles, while optimising the benefits such as reduced transport costs, improved air quality and less noise pollution.

The South Australian government will plan a transition of the public transport system to low and zero emissions vehicles, informed by investigations and trials of viable hydrogen and/or electric technologies, and other low emissions mass transit options. Infrastructure, operational and network requirements for further deployment will be assessed. Following the completion of the Gawler Rail Electrification Project, the government will investigate conversion of remaining diesel-powered suburban train lines to alternative power sources.

The design and management of road and rail transport networks, more fuel efficient vehicles, and improved freight efficiency (e.g. more efficient driving, and supply chain and load optimisation) will also contribute to lower vehicle emissions.

Some current initiatives:

- In 2020, 53% of the government's fleet of 6750 passenger and light commercial vehicles were either low or zero emissions vehicles.
- Metropolitan rail lines, including Seaford, Tonsley and most recently Gawler, are being progressively electrified to deliver modern, environmentally friendly and efficient train services.
- The government is investing to accelerate public electric vehicle charging infrastructure in South Australia, and to trial smart charging and grid integration for a more secure electricity network and lower transport and electricity costs.

Actions 2021–25

4.1.	**Implement *South Australia's Electric Vehicle Action Plan***	*South Australia's Electric Vehicle Action Plan* will address key barriers to electric and hydrogen fuel vehicle uptake, including supporting deployment of a statewide public charging network and other actions to optimise the benefits for South Australians.
4.2.	**Plan to transition the public transport system to align with net zero emissions targets**	The government will plan for a staged transition of the public transport fleet and operations to align with the government's net zero emissions targets. The work will be informed by a trial of commercially available and operationally proven hydrogen and/or electric buses. Emissions reduction will be supported in contracts for procurement, operation, maintenance and service delivery of the public transport fleet.
4.3.	**Investigate mechanisms to reduce the emissions intensity of freight and heavy vehicle transport**	The government will investigate ways to facilitate and encourage low emissions freight and heavy vehicle transport in South Australia and to prepare for low and zero emissions vehicles. The government will contribute to Australian Government initiatives to provide efficient freight corridors.

CASE STUDY: Zero emissions bus manufacturing

South Australia's Precision Buses, part of the BusTech Group, is building battery electric and hydrogen fuel cell buses for the Australian and international market. The company has developed strategic partnerships with international technology providers to ensure that its zero emissions buses incorporate the most advanced battery and fuel cell technology.

Align transport and urban planning with low emissions transport outcomes

To reduce emissions and ensure efficient and reliable mobility, the government's transport planning will contribute to more efficient road and rail transport infrastructure, prioritise public transport and separated bikeways, and prepare for low and zero emissions vehicles.

Urban and built environments that reduce the need for car travel and make active travel more accessible are integral to the creation of liveable urban spaces and rejuvenated neighbourhoods. South Australia's State Planning Policies support land use development integrated with transport and infrastructure planning. This includes locating more housing options and mixed-use development close to existing and proposed public transport routes and planning for urban growth that minimises freight movement and reduces travel distances.

Some current initiatives:

- The government is working with the City of Adelaide on a 20-year City Access Strategy to guide more efficient travel in and around the Adelaide CBD, reducing reliance on private motor vehicles, and encouraging active travel and public transport use.
- The government has rezoned land at strategic locations close to public transport and activity centres to create a more compact urban form that supports active travel and the use of public transport.

Actions 2021–25

4.4.	**Plan for development and urban renewal that creates walkable, connected neighbourhoods and reduces the need for car journeys**	Land use policy and planning will provide for neighbourhoods that are more walkable and connected and that support public transport uptake. For example, the *Metropolitan Growth Management Program* seeks to locate development near areas well serviced by public transport and other infrastructure.
4.5.	**Align transport planning with net zero emissions outcomes**	The government's Climate Smart Policy Directions will be embedded in transport and infrastructure planning and investment frameworks. This will ensure that investment decisions consider construction and operational emissions, transport user emissions and low emissions mobility technologies.

Increase the use of public transport and active travel

Greater use of public transport, active travel (such as cycling and walking) and e-mobility options (such as e-scooters) reduces traffic congestion and improves public health and wellbeing, while contributing to reducing the state's greenhouse gas emissions.

To encourage South Australians to leave their cars at home and use the public transport network, the government will make tram, train and bus services more efficient, more accessible and more frequent.

To stimulate more active travel, the government will prioritise delivery of enhancements to key walking and cycling routes. In road network allocation, increased priority will be given to pedestrians, separated bikeways and public transport.

Some current initiatives:

- Driverless vehicle trials are helping to inform transport planning and grow the technology with the potential to deliver better services and fill gaps that exist in the public transport network.
- The Tonsley rail line is being extended to Flinders Medical Centre, creating new public transport and active travel connections to health, innovation and education precincts.
- As part of the Northern Connector Project, over 24 kilometres of shared use path connect the Stuart O'Grady Bikeway to Port Adelaide. The path provides links to the Dry Creek and Little Para River Trails and the Gawler Greenway between Islington and Mawson Lakes.

Actions 2021–25

4.6.	**Drive increased patronage of public transport through delivery of services that are more efficient, integrated and customer-focused**	The government will deliver a modern and customer-focused public transport network to encourage greater uptake and thereby reduce private car use and associated greenhouse gas emissions. This includes investigating more on-demand transport services.
4.7.	**Develop and deliver an active travel and mobility program for Greater Adelaide**	The government will plan for prioritised delivery of improvements to key cycling and walking routes to increase opportunities for active travel. Priority greenways will be completed and the bikeways network will be expanded and separated as funding is made available. In addition, provision for pedestrians, cyclists and public transport in road network planning and upgrades will be increased.

5. Climate smart built and urban environments

Built and urban environments that are climate resilient and have net zero emissions will support ongoing prosperity and wellbeing and maintain South Australia's reputation as one of the most liveable places in the world.

Key objectives:

- **Provide for development and design that is low emissions and climate resilient**
- **Accelerate strategic urban greening**
- **Understand and reduce climate change risks to infrastructure**

Provide for development and design that is low emissions and climate resilient

Much of the infrastructure, buildings and urban design that we establish now will still be in place in 2050 or beyond and will need to be safe, functional and relevant in a climate and economy very different from today.

Our built and urban environments also provide opportunities for significant reductions in greenhouse gas emissions. Opportunities include phasing out synthetic gases commonly used in refrigeration and air conditioning, switching to renewable electricity or hydrogen fuel, improving energy efficiency in buildings, and using low-carbon materials in construction.

With greater priority on emissions reduction and climate resilience, there will be potential business growth opportunities in climate smart materials, design, retrofit and construction solutions. These opportunities include supply and manufacture of low emissions building materials, such as green cement and steel or engineered timber; climate resilient urban design; and onsite energy efficiency, renewable energy and storage solutions.

The South Australian government will play a key role in enabling climate smart design and construction through improving policies and standards in South Australia's planning and development system and by influencing policies in the National Construction Code. Working with local government to better understand how natural hazards, such as floods and bushfire, will change under a future climate can inform changes to land use planning that help avoid inappropriate development in high risk areas.

Government procurement, infrastructure requirements, urban renewal and public housing strategies can also help encourage more low emissions and climate resilient infrastructure, buildings and public spaces. Guidance will be developed to help stakeholders go 'beyond compliance' in climate smart design.

Some current initiatives:

- South Australia's State Planning Policies provide for climate-ready development, greening and water sensitive urban design.
- The government is trialling low emissions cement in non-structural concrete elements for the Regency to Pym St section of the new South Road motorway.
- Building Upgrade Finance helps commercial building owners access loans to improve energy, water and environmental efficiency.
- Some 4100 Housing SA properties will receive solar PV and batteries to save money on their power bills.

Actions 2021–25

5.1.	**Strengthen climate smart planning, building and design policies and their implementation in the planning system**	South Australia's land use planning system will continue to identify and implement improvements in planning policies, practices and assessments for low emissions and climate resilient planning and development outcomes.
5.2.	**Embed strategic climate impact assessment into Regional Plans**	The best available understanding of climate related risk will inform development of regional plans under South Australia's modernised planning system. Regional Plans provide regionally specific strategic direction for integrated land use planning, transport infrastructure and economic development and identify areas for conservation and protection.
5.3.	**Support development and implementation of stronger climate smart standards in the *National Construction Code***	The South Australian government will contribute to improvements in standards in energy efficiency, emissions and climate resilience in the *National Construction Code* and relevant South Australian standards. This includes supporting development of guidance to assist developers and home owners to apply the standards.
5.4.	**Promote opportunities to encourage the private and public sector to go 'beyond compliance' in climate smart design**	Work will be undertaken to develop opportunities, including guidance or targeted guidelines, that encourage consumers, designers, developers, builders and assessors to understand and apply climate smart design that goes 'beyond compliance' with relevant standards.
5.5.	**Support climate smart development for public housing, affordable private dwellings and urban renewal projects**	The government will support environmentally sustainable design and construction of public housing, affordable housing solutions and innovative urban precinct developments. This includes consideration of thermal performance, energy efficiency, solar and battery storage systems and health and wellbeing outcomes.
5.6.	**Deliver low emissions infrastructure and operations**	Agencies will use specifications and contract tools to help drive low emissions infrastructure design, construction, operation and maintenance. Where feasible, agencies will encourage the use of low and zero emissions technology and materials, and support recycling and reuse as part of a more circular economy.
5.7.	**Assess climate change risks on development applications referred to the Environment Protection Authority for direction**	When providing advice and giving direction on new development applications, the Environment Protection Authority will assess how climate related changes, such as sea level rise and more frequent extreme weather events, increase risks to, or alter the environmental impacts, of the proposed development.

CASE STUDY: Climate smart built environment at Lot Fourteen

Lot Fourteen, on the site of the former Royal Adelaide Hospital, has been 6 Star Green Star Community rated for high levels of sustainability and climate change resilience. The adaptive reuse of the heritage-listed buildings retains captured carbon and reduces loss of materials to landfill. Lot Fourteen also uses shared heating, cooling, waste, energy and transport services, rather than providing these on a building-by-building basis.

Accelerate strategic urban greening

Green infrastructure refers to assets such as trees, parks, wetlands, green roofs and walls, and rain gardens. Increasing green infrastructure helps to reduce urban heat, create habitat for wildlife, and improve liveability and amenity. For example, trees and other vegetation have been shown to reduce land surface temperatures by between 5 and 6 degrees Celsius during heatwaves[x]. Cooling benefits can be enhanced with smart irrigation.

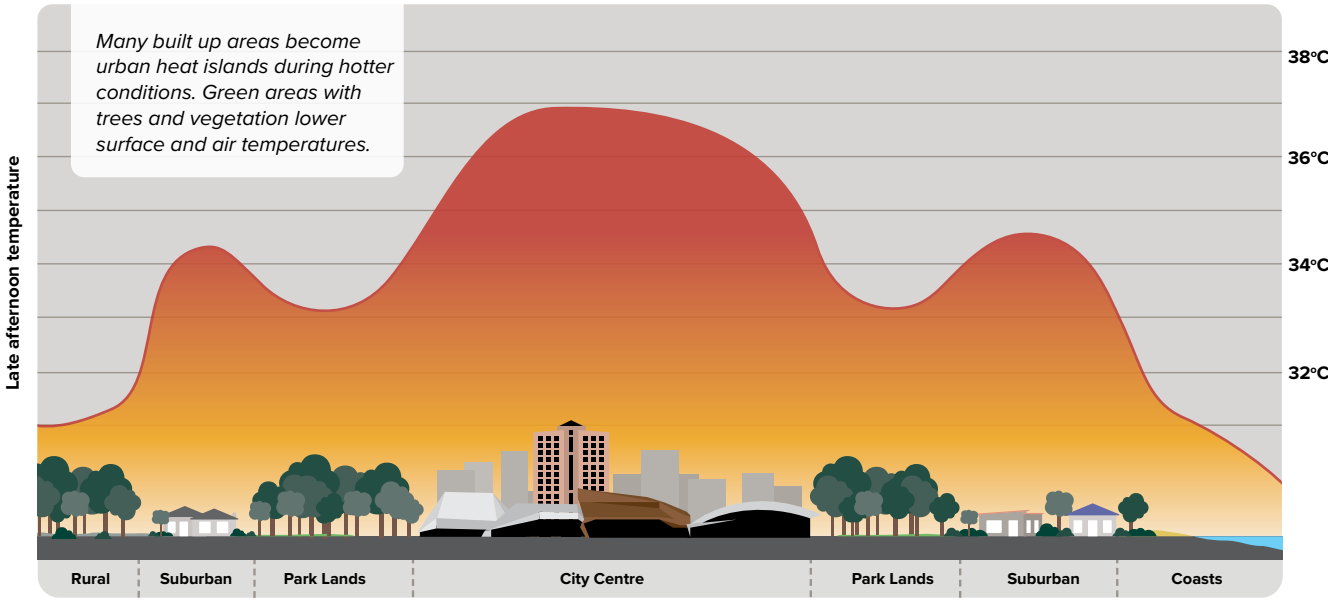
The *30-Year Plan for Greater Adelaide*[xi] aims to increase urban green cover by 20% in metropolitan Adelaide, creating cooler, shady and more walkable neighbourhoods and more habitat.

To encourage greater levels of urban greening, the existing requirements for urban greening and water sensitive urban design in the land use planning system will be expanded and planning policies, guidelines and incentives will be improved. As urban block sizes reduce and infill development occurs, more effort will be needed to ensure space for green infrastructure on both public and private land. Reliable water supplies will also be needed to maintain trees and green spaces (see the focus area 'Climate smart agriculture, landscapes and habitats').

The Green Adelaide Landscape Board has a focus on greening and water sensitive urban design and will work with state government agencies and local government to accelerate efforts to green and cool our backyards, streets and neighbourhoods. This includes coordinating new actions to identify strategic priorities, address barriers to uptake and increase the number of urban greening projects across Adelaide.

Some current initiatives:

- The Open Spaces and Places for People, and Greener Neighbourhoods funds provide grants to local councils to create neighbourhoods that are greener, cooler and more connected.
- The government's Healthy Parks Healthy People SA program released *Creating Greener Places for Healthy and Sustainable Communities* in 2019 as a guide to promote and prioritise quality green open spaces in our neighbourhoods.
- SA Water and local councils' monitoring of irrigated green spaces shows that they are, on average, three to five degrees cooler compared with non-irrigated spaces. This information will help plan future park upgrades and is available on the SA Water website.



Actions 2021–25

5.8.	**Identify strategic opportunities for urban greening in metropolitan Adelaide**	Green Adelaide, state government agencies and local councils will work together to identify and map strategic opportunities for green infrastructure to address the urban heat island effect and optimise benefits.
5.9.	**Develop improved policies, tools and guidance for the new planning system to achieve greener and cooler neighbourhoods**	The government will work to improve standards, incentives and guidelines aligned with the South Australian Planning System to support greater uptake of green infrastructure across the state.
5.10.	**Increase implementation of green infrastructure through capacity building and incentives**	Green Adelaide and state government agencies will collaborate on an integrated program of measures to increase greening in public and private spaces, including funding grants, capacity building, and greening of suitable infrastructure projects.

CASE STUDY: Cool Road Adelaide

The Cool Road Adelaide project, a partnership between the state government, City of Adelaide and Climate KIC Australia, tested three heat-reflective road treatments at Bowen Street West, near the Adelaide Central Bus Station. All three products showed a reduced surface temperature relative to the control asphalt road, with one showing a reduction of 8.6 degrees Celsius during the day and 4.2 degrees Celsius at night.

Understand and reduce climate change risks to infrastructure

The South Australian government is responsible for a wide range of infrastructure that supports communities and underpins economic growth, including in the areas of transport, energy, water, waste, health, culture and recreation, tourism and education.

It has been estimated that constructing infrastructure that is more climate resilient has a long-term benefit-to-cost ratio of around 4:1 while adding only around 3% to upfront costs[xii]. Addressing climate related risk in the location, design, construction and operation of infrastructure will mitigate costs arising from more frequent and severe natural hazards such as heat stress, bushfires, flooding and extreme storms. For example, the cost to businesses of a statewide blackout from one major storm event in 2016 was estimated at around $367 million[xiii].

New infrastructure, such as sea walls or flood-protection works, will also play an important role in reducing risk from more frequent and severe natural hazards.

The government will continue to improve its understanding and management to reduce risks of climate related damage to public infrastructure.

The South Australian government partners with industry and the Australian Government to manage critical infrastructure. Critical infrastructure provides the services that are essential for everyday life such as energy, food, water, transport, communications, health, banking and finance. The development of a South Australian critical infrastructure strategy will help address the likely impacts of climate change and align with work being conducted nationally and within industry on critical infrastructure resilience.

Some current initiatives:

- As part of the reform of the land use planning system, coast protection policies ensure that new development is not exposed to hazards such as coastal flooding, erosion and sea level rise.
- The Department for Infrastructure and Transport takes account of natural hazards and climate related risks in the planning and design of new transport infrastructure.

Actions 2021–25

5.11. Develop a South Australian critical infrastructure strategy	The government will develop a strategy for supporting and achieving resilient critical infrastructure that considers all hazards and threats, including the impacts of natural hazards under a changing climate.
5.12. Assess and address climate change risk in government infrastructure decisions, risk assessment and audit processes	Agencies will manage climate change risk in long-term infrastructure decisions, including infrastructure investment, location, design, construction and material selection. This includes using climate change projections and scenarios to inform risk assessment, management and audit processes.

6. Resilient communities

Communities across South Australia are experiencing the impacts of a changing climate and are responding in a variety of ways. The government will continue to assist communities to reduce risk, adapt and build resilience.

Key objectives:

- **Support communities and businesses to build resilience and adapt**
- **Enhance climate change adaptation in emergency management and health services**
- **Provide high-quality and accessible climate change science and information**

Building resilience and reducing climate related risk requires communities, businesses, individuals and governments at all levels to work together to prevent, prepare for, respond to and recover from climate change impacts.

As the climate changes, natural hazards such as heatwaves, bushfire, drought, storms and floods are projected to become more frequent and severe. More people and assets are likely to be exposed and vulnerable, with increasing social and economic costs.

The changing climate also affects communities in a range of other ways, including health impacts from increased pollutants and allergens, risks to food and water supplies, and effects on mental health.

Minimising these impacts requires a wide range of responses. Many actions across different focus areas in this Action Plan will contribute to building community resilience and reducing risk, including land use planning changes, business innovation, agriculture and infrastructure management, water management and urban greening.

Creating a more bushfire resilient South Australia

During the 2019–20 bushfire season, South Australians experienced the worst bushfire conditions on record, including an extended fire danger season, prolonged heatwave conditions and fires that exceeded the limits of firefighting capacity. In South Australia, about 280,000 hectares of land was burned and the bushfires resulted in three fatalities, numerous injuries and significant property loss and damage.

In response to the Independent Bushfire Review into South Australia's 2019–20 Bushfire Season[xiv] the government is investing to better prepare the state for future significant bushfire events. Key actions include increased hazard reduction, new trucks and better equipment, enhanced communications and technology, better protection for critical assets and improved bushfire management planning.

Support communities and businesses to build resilience and adapt

Building resilience is strongly linked with reducing disaster risk. South Australia is committed to implementing the *National Disaster Risk Reduction Framework* to reduce disaster risk related to natural hazards in a changing climate. Joint Commonwealth and state disaster risk reduction funding supports projects that enable communities and businesses to adapt to changing climate related risks.

A range of new or enhanced actions will be delivered to create greater awareness and build resilience in response to the risk of natural hazards and disasters. For example, implementation of *Stronger Together: South Australia's Disaster Resilience Strategy 2019–2024* will deliver projects to support communities and small businesses to be better prepared and function during and after natural disasters.

The state government will continue its engagement in Regional Climate Partnerships in collaboration with local government and other regional organisations to support local on-ground climate adaptation and mitigation projects.

Some current initiatives:

- Regional Climate Partnerships deliver local climate adaptation and mitigation projects ranging from hazard mapping, greening and smart irrigation projects, through to education programs and community capacity building.
- During heatwaves, the SA State Emergency Service issues scaled heatwave warnings and SA Health executes an *Extreme Heat Strategy* to manage heat impacts on community health.
- Programs such as Climate Ready Schools provide resources and support for students and teachers to adopt sustainable practices that reduce their school's greenhouse gas emissions and operating costs.

Actions 2021–25

6.1.	**Implement the *National Disaster Risk Reduction Framework* and *Stronger Together: South Australia's Disaster Resilience Strategy***	The framework and strategy will support practical actions across agencies to reduce disaster risk and build community resilience in the face of more frequent and severe bushfires, storms, floods and heatwaves.
6.2.	**Build the resilience of small businesses and not-for-profit organisations to climate change, natural disasters and adverse events**	Small businesses and not-for-profit organisations will have access to information and engagement activities to improve continuity planning and build resilience to climate change, natural disasters and adverse events. The program will be piloted in Kangaroo Island and the Adelaide Hills.
6.3.	**Engage with the community about the increasing frequency and severity of emergencies and disasters**	Climate change information and impacts will be incorporated in emergency management sector education and engagement to create greater awareness and understanding of being more prepared for hazards and natural disasters.
6.4.	**Support Regional Climate Partnerships to deliver local adaptation and mitigation projects**	The government will partner with local government and other regional organisations through the Regional Climate Partnerships network to support projects that help communities adapt and mitigate climate risk.

CASE STUDY: Where We Build, What We Build

The Resilient Hills and Coasts Regional Climate Partnership (supported by the South Australian government) and the Insurance Council of Australia have assessed how different housing types perform in response to flood, bushfire and heat. The economic benefits of climate-ready homes were shown to outweigh the costs for new builds and retrofits. Guidance has been developed on how to build a climate-ready home.

Enhance climate change adaptation in emergency management and health services

The government will take a coordinated approach to emergency management that considers the impacts of climate change on all hazards and government's capacity to reduce risks and meet changing patterns of demand for services.

All government agencies will consider how their functions, operations and services could be affected and how to mitigate risks. Hazard leaders identified in the *State Emergency Management Plan* have particular responsibilities to understand and adapt to changing needs in preparing, managing and responding to natural disasters.

Much of South Australia's capacity to respond to natural hazards and disasters relies on volunteers from the Country Fire Service and State Emergency Service. The state government will seek to understand and address future demands through its volunteering and workforce strategies and planning.

Climate change is also an important public health issue. Protecting against public and environmental health risks and responding to climate change is a priority in the *State Public Health Plan 2019–2024*. Likewise, the *South Australian Health and Wellbeing Strategy 2020–2025*, which positions the state's health system for the future, recognises that climate change poses risks for the health system to manage.

Some current initiatives:

- Extreme heat or cold weather activate either a Code Red or Code Blue response coordinated by government, resulting in homelessness services visiting rough sleeper locations to make people aware of the support available.
- SA Health supports local councils with public health planning, including consideration of climate change risk as a key public health issue.
- The government has increased funding for bushfire prevention measures to help mitigate increasing fire risk and to build community resilience.

Actions 2021–25

6.5.	**Build the capability and capacity of emergency services to mitigate and adapt to climate related risks, including an adaptive volunteer workforce**	Incorporate new data and technology to better understand and respond to the impacts of climate change on emergency services, including the volunteer workforce. Adaptation and mitigation priorities will be identified and strategies developed to strengthen capacity and build future capability.
6.6.	**Embed climate change adaptation into emergency services governance, policy and decision-making**	The emergency services sector will integrate climate risk management and responses to the increased frequency and intensity of natural hazards into organisational policy, planning and operations, including investment in new assets and technology.
6.7.	**Assess and plan for future health services, programs and policy needs and for health assets and infrastructure in a changing climate**	SA Health will assess the vulnerability of its assets and programs, develop a model for assessing health service and policy needs, and develop a sustainability policy to guide the development and delivery of future projects, partnerships, policies and programs. SA Health will work in partnership with other agencies to mitigate and adapt to the changing climate.

Provide high-quality and accessible climate change science and information

High-quality and accessible information about the changing climate and its impacts is fundamental for communities, businesses and individuals to manage climate related risks and take advantage of opportunities.

The government's *Climate Change Science and Knowledge Plan for South Australia* will further improve the quality and availability of scientific and technical information for planning and risk management.

A priority action is to improve mapping, modelling and information on how climate related hazards—especially bushfire, flood, extreme heat and coastal inundation—could intensify as the climate changes. This work will inform climate risk assessment, land use and infrastructure planning, zoning and development approvals, and emergency management planning. The state government will work with local government to deliver this work.

The government is committed to continuously improving climate change data and information and ensuring its accessibility for individuals, planners and other decision-makers to use in risk assessments and adaptation planning.

Some current initiatives:

- The government's SA Climate Ready website provides regional data on projected changes in rainfall, temperature, frost and other climate variables through to 2100.
- South Australia is working in partnership with New South Wales and the Australian Capital Territory to improve climate change projections and hazard data for South Australia using the latest generation climate models and emissions scenarios.
- Urban heat maps and maps of coastal inundation risks are available at Enviro Data SA.

Actions 2021–25

6.8.	**Implement the *Climate Change Science and Knowledge Plan for South Australia***	The *Climate Change Science and Knowledge Plan for South Australia* identifies key actions to improve and share science and knowledge to enable informed decision-making on managing climate risk. This includes improving online access to scientific and technical information for climate change response planning.
6.9.	**Integrate future climate change risk into hazard mapping and information**	The Department for Environment and Water will work with local government and other government agencies to improve mapping, modelling and information on how risks from flood, bushfire, extreme heat and coastal inundation will be affected by climate change.

7. Government leading by example

The South Australian government will lead by example by reducing its emissions and demonstrating best practice in managing climate related risk and opportunities.

Key objectives:

- Embed climate change risk and opportunity into government policy and practice
- Accelerate work towards net zero emissions in government

Embed climate change risk and opportunity into government policy and practice

South Australian government agencies will build on existing initiatives to ensure climate related risks are adequately considered and addressed in decision-making, policy and planning, service delivery, asset management and emergency management.

A coordinated approach will be taken to build the capacity of agencies to assess climate related risks and identify effective adaptation strategies for priority risks.

Strengthening the government's approach will enable agencies to more effectively meet changing demands for services, reduce risks to public assets and infrastructure, and provide suitable information and policies to support business, the community and individuals to adapt. For example, SA Health will assess the climate change vulnerability of its assets and programs to inform planning for future health services and infrastructure.

There are also opportunities to explore what government agencies can do to encourage broader climate smart outcomes. For example, government procurement policies, and specifications for buildings, infrastructure and other capital works, can create demand for and encourage innovation in low emissions and climate resilient goods and services.

Accelerate work towards net zero emissions in government

The government will take an across-agency approach to implement practical and cost-effective emissions reduction actions for its assets and operations, including vehicles, buildings, infrastructure and waste management. For example, the government's energy contract will support additional renewable energy generation and storage in South Australia, reducing government emissions and creating jobs. New investment announced in 2020 to improve energy efficiency in government buildings will further reduce emissions while also creating jobs and reducing energy costs.

More work will be undertaken to develop an emissions inventory, identify emissions reduction goals and timeframes, assess existing initiatives, and implement additional emissions reduction opportunities. Robust measurement, data management and reporting systems will be established to track progress.

Some current initiatives:

- The Sustainable Schools Program supports energy efficiency improvements and renewable energy upgrades in schools and has supported lighting upgrades in 200 schools and solar PV systems in more than 40 schools.
- The Renewal SA development at Bowden has been 6 Star Green Star Communities rated for high levels of environmental sustainability and climate change resilience.
- Minimum 5 Star Green Star interiors and performance ratings are required for new government buildings and substantial refurbishments.

Actions 2021–25

7.1.	**Ensure climate risk and opportunity are addressed across government policy and practice**	A coordinated *Climate Risk Ready Government* initiative will build agencies' capability to identify and respond to climate related risk and opportunities. All agencies will take action to ensure climate related risks and opportunities are understood and addressed.
7.2.	**Explore and implement additional climate smart procurement reforms**	Procurement requirements and guidance for government agencies to support greater adaptation and emissions reduction outcomes will be developed and implemented.
7.3.	**Explore innovative financing and investment approaches for adaptation and emissions reduction**	The government will explore options for innovative financing and investment that can support public and private sector adaptation and emissions reduction projects.
7.4.	**Coordinate an across-agency government greenhouse gas emissions reduction program**	An across-agency program will support agencies to reduce emissions from government assets and operations in a cost-effective manner. This will include implementing robust measurement and using new monitoring and reporting systems to track progress towards achieving net zero emissions.
7.5.	**Develop and implement a government waste strategy**	The government will implement a *South Australian Government Waste Strategy* to improve recycling and waste management in South Australian government premises and, thereby, contribute to emissions reduction.

CASE STUDY: Making the state's health assets more energy efficient

SA Health's buildings account for around half of the government's energy use and greenhouse gas emissions. All new builds and major refurbishments aim to achieve 20% greater energy efficiency than the minimum required in the 2019 *National Construction Code*. Since 2000–01, the energy efficiency of SA Health buildings has improved by more than 27%.

CASE STUDY: SA Water's Zero Cost Energy Future

SA Water is working towards a zero cost energy future, including the installation of around 500,000 solar panels. The panels will generate 242 GWh of energy – equivalent to the power needs of 50,000 average South Australian homes. For every year of operation, this will assist in reducing emissions equivalent to planting 7 million trees or removing more than 32,000 cars from the road.


DOGS
ON
LEASH

Implementation and reporting

All state government agencies have a role in implementing the Action Plan and robust across-agency implementation arrangements will be established.

The government recognises that reducing state emissions and building a climate smart state requires a whole-of-community and whole-of-economy response.

The government will work with industries, businesses, communities, local government and the Australian Government to implement the Action Plan and encourage action beyond the role of government.

While the Action Plan describes the core activities that government agencies will deliver, the South Australian government will remain open to new opportunities and actions arising from stakeholder engagement, innovation, advances in technology, and changing market demands.

The state's progress in reducing emissions will be measured and publicly reported drawing from data produced by the Australian Government's national greenhouse gas inventory.

The Premier's Climate Change Council, an independent advisory body to the South Australian government, will assist in monitoring implementation of the Action Plan. The Council will lead a review of progress prior to the end of the implementation period and work with government agencies to inform future government priorities and actions.

Appendix 1: Action summary

Table A1: Summary of key objectives and government-led actions

Key objectives and actions		Directions for a Climate Smart SA: Unlock innovation and economic opportunity	Reduce net emissions	Build resilience and adapt	Provide accessible information	Government leading by example	Lead agency (and key partners)[2]
1. Clean energy transformation							
Accelerate the renewable energy economy							
1.1	Drive the continued development of renewable energy and energy storage	✓	✓				DEM *(with DTI)*
1.2	Fast-track construction of a new South Australia to New South Wales high capacity electricity interconnector	✓	✓				DEM
1.3	Implement *South Australia's Energy Solution*	✓	✓				DEM
1.4	Implement energy demand management and productivity programs	✓	✓				DEM
1.5	Increase renewable electricity generation in remote communities		✓	✓			DEM *(with SA Water)*
Develop a world-class renewable hydrogen industry							
1.6	Implement *South Australia's Hydrogen Action Plan*	✓	✓				DEM *(with DTI)*
2. Climate smart economy							
Attract and grow businesses and industries powered by renewables							
2.1	Support the growth and attraction of businesses and industries powered by renewables	✓	✓				DTI *(with DEM and GISA)*
Support climate smart business innovation, risk management and growth							
2.2	Integrate climate smart thinking into export sector strategies and South Australia's *Growth State Plan*	✓	✓	✓			DTI and DEW *(with DIS, GISA and other Growth State partner agencies)*
2.3	Coordinate delivery of climate smart business engagement	✓	✓	✓	✓		DEW *(with DTI, DIS, PIRSA, DPC, DEM and GISA)*
2.4	Support research and development to deliver new climate smart innovation	✓	✓	✓			DIS and DEW *(with GISA)*
2.5	Support the development and commercialisation of innovative climate smart products and services	✓	✓	✓			DIS *(with GISA)*
2.6	Support development of renewable energy and climate smart industry training products and pathways	✓	✓	✓	✓		DIS
2.7	Work with *Environment Protection Act 1993* licensees to understand climate change risk and liabilities and enable adoption of risk management strategies			✓			EPA *(with DEW)*

[2] Please see Abbreviations for explanations of agencies. Key state government agency partners are indicated, noting other stakeholders and partners, including local government and the Australian Government, will also be involved as appropriate.

Key objectives and actions		Directions for a Climate Smart SA					Lead agency (and key partners)[2]
		Unlock innovation and economic opportunity	Reduce net emissions	Build resilience and adapt	Provide accessible information	Government leading by example	
2.8	Grow the South Australian water industry as a local and global supplier of innovative water solutions	✔		✔			DEW *(with SA Water)*
Develop a more circular economy							
2.9	Support business and communities to adopt circular economy practices	✔	✔		✔		GISA *(with EPA and SA Water)*
2.10	Implement *South Australia's Waste Strategy 2020–2025*	✔	✔				GISA *(with EPA)*
2.11	Implement *South Australia's Food Waste Strategy*	✔	✔				GISA *(with EPA)*
2.12	Deliver a stronger regulatory framework to reduce waste and encourage greater reuse of materials to support a circular economy	✔	✔				EPA
Develop a climate smart resources sector							
2.13	Develop and implement policies to facilitate investment in large-scale carbon capture and storage	✔	✔				DEM *(with EPA)*
2.14	Develop projects and strategies to facilitate the discovery of minerals that support technology and a low emissions economy	✔	✔				DEM
2.15	Investigate climate change regulatory risk that may apply to the minerals sector in South Australia	✔	✔				DEM
3. Climate smart agriculture, landscapes and habitats							
Support the agricultural sector to adapt, innovate, and reduce net emissions							
3.1	Identify and develop climate smart aquaculture opportunities	✔		✔			PIRSA
3.2	Identify opportunities for commercial development and use of biomass	✔	✔				PIRSA *(with DEM and GISA)*
3.3	Support primary producers in adaptation planning, reducing net emissions and identifying economic opportunities	✔	✔	✔	✔		PIRSA *(with DEW, GISA and landscape boards)*
3.4	Implement enhanced biosecurity surveillance and reporting			✔	✔		PIRSA
Support expansion of carbon farming and blue carbon							
3.5	Implement the *Blue Carbon Strategy for South Australia*	✔	✔	✔			DEW *(with PIRSA, SA Water, landscape boards and EPA)*
3.6	Support uptake of carbon farming opportunities	✔	✔	✔			DEW and PIRSA *(with GISA, SA Water and landscape boards)*
3.7	Develop carbon sequestration opportunities on conservation land	✔	✔	✔			DEW

Key objectives and actions		Directions for a Climate Smart SA					Lead agency (and key partners)[2]
		Unlock innovation and economic opportunity	Reduce net emissions	Build resilience and adapt	Provide accessible information	Government leading by example	
Ensure secure, climate resilient regional and urban water supplies							
3.8	Increase climate resilient water supplies, water reuse and efficient use of water	✔		✔			SA Water
3.9	Undertake water security planning for priority regional areas	✔		✔			DEW *(with landscape boards, SA Water and PIRSA)*
3.10	Develop a framework to deliver integrated urban water management and inform investment decisions	✔		✔			DEW *(with SA Water and Green Adelaide)*
Build the climate resilience of landscapes, habitats and natural resources							
3.11	Develop a climate smart, long-term coastal strategy			✔			DEW and CPB *(with landscape boards)*
3.12	Assess the implications of climate change for South Australia's ecosystems to inform critical adaptation strategies			✔	✔		DEW *(with landscape boards, PIRSA, SA Water and AGD)*
3.13	Develop and apply a dynamic biodiversity fire management planning tool for conservation outcomes			✔			DEW *(with landscape boards and CFS)*
3.14	Landscape planning will consider climate change mitigation and adaptation for natural resources and landscapes	✔	✔	✔	✔		Landscape boards and DEW
4. Low emissions transport							
Support the uptake of low and zero emissions vehicles and fuels							
4.1	Implement *South Australia's Electric Vehicle Action Plan*	✔	✔			✔	DEM *(with DIT, DTF, GISA and DTI)*
4.2	Plan to transition the public transport system to align with net zero emissions targets	✔	✔			✔	DIT
4.3	Investigate mechanisms to reduce the emissions intensity of freight and heavy vehicle transport		✔				DEW and DIT *(with DEM)*
Align transport and urban planning with low emissions transport outcomes							
4.4	Plan for development and urban renewal that creates walkable, connected neighbourhoods and reduces the need for car journeys		✔	✔			AGD
4.5	Align transport planning with net zero emissions outcomes	✔	✔				DIT *(with DEW, DTF, ISA, AGD and DPC)*
Increase the use of public transport and active travel							
4.6	Drive increased patronage of public transport through delivery of services that are more efficient, integrated and customer-focused		✔				DIT
4.7	Develop and deliver an active travel and mobility program for Greater Adelaide		✔				DIT

Key objectives and actions		Directions for a Climate Smart SA: Unlock innovation and economic opportunity	Reduce net emissions	Build resilience and adapt	Provide accessible information	Government leading by example	Lead agency (and key partners)[2]
5. Climate smart built and urban environments							
Provide for development and design that is low emissions and climate resilient							
5.1	Strengthen climate smart planning, building and design policies and their implementation in the planning system		✓	✓			AGD *(with DEW and GISA)*
5.2	Embed strategic climate impact assessment into Regional Plans			✓	✓		AGD *(with DEW)*
5.3	Support development and implementation of stronger climate smart standards in the *National Construction Code*		✓	✓	✓		AGD and DEM *(with DEW and GISA)*
5.4	Promote opportunities to encourage the private and public sectors to go 'beyond compliance' in climate smart design		✓	✓	✓		ODASA
5.5	Support climate smart development for public housing, affordable private dwellings and urban renewal projects	✓	✓	✓		✓	SAHA and Renewal SA
5.6	Deliver low emissions infrastructure and operations	✓	✓			✓	DIT and all agencies
5.7	Assess climate change risks on development applications referred to the Environment Protection Authority for direction			✓	✓		EPA
Accelerate strategic urban greening							
5.8	Identify strategic opportunities for urban greening in metropolitan Adelaide			✓			Green Adelaide *(with AGD, DEW and SA Water)*
5.9	Develop improved policies, tools and guidance for the new planning system to achieve greener and cooler neighbourhoods			✓	✓		AGD *(with Green Adelaide and DEW)*
5.10	Increase implementation of green infrastructure through capacity building and incentives			✓			Green Adelaide, AGD and DIT *(with Renewal SA)*
Understand and reduce climate change risks to infrastructure							
5.11	Develop a South Australian critical infrastructure strategy			✓	✓		DPC *(with SA Police and relevant infrastructure agencies)*
5.12	Assess and address climate change risk in government infrastructure decisions, risk assessment and audit processes			✓	✓	✓	All agencies *(with ISA)*
6. Resilient Communities							
Support communities and business to build resilience and adapt							
6.1	Implement the *National Disaster Risk Reduction Framework* and *Stronger Together: South Australia's Disaster Resilience Strategy*			✓		✓	SAFECOM *(with CFS, MFS, SES and other emergency management organisations)*

Key objectives and actions		Directions for a Climate Smart SA					Lead agency (and key partners)[2]
		Unlock innovation and economic opportunity	Reduce net emissions	Build resilience and adapt	Provide accessible information	Government leading by example	
6.2	Build the resilience of small businesses and not-for-profit organisations to climate change, natural disasters and adverse events	✓		✓			DIS *(with SAFECOM, DEW and GISA)*
6.3	Engage with the community about the increasing frequency and severity of emergencies and disasters			✓	✓		SAFECOM *(with emergency management organisations)*
6.4	Support Regional Climate Partnerships to deliver local adaptation and mitigation projects		✓	✓			DEW *(with Green Adelaide and landscape boards)*
Enhance climate change adaptation in emergency management and health services							
6.5	Build the capability and capacity of emergency services to mitigate and adapt to climate related risks, including an adaptive volunteer workforce			✓	✓	✓	SAFECOM *(with CFS, MFS and SES)*
6.6	Embed climate change adaptation into emergency services governance, policy and decision-making			✓	✓	✓	SAFECOM *(with CFS, MFS and SES)*
6.7	Assess and plan for future health services, programs and policy needs and for health assets and infrastructure in a changing climate			✓		✓	SA Health
Provide high-quality and accessible climate change science and information							
6.8	Implement the *Climate Change Science and Knowledge Plan for South Australia*				✓		DEW *(with AGD, DPC, SAFECOM, CFS, MFS, SES, CPB, SMA and landscape boards)*
6.9	Integrate future climate change risk into hazard mapping and information			✓	✓		DEW *(with AGD, DPC, SAFECOM, CFS, MFS, SES, CPB and SMA)*
7. Government leading by example							
Embed climate change risk and opportunity into government policy and practice							
Accelerate work towards net zero emissions in government							
7.1	Ensure climate risk and opportunity are addressed across government policy and practice			✓		✓	All agencies and DEW *(including key boards)*
7.2	Explore and implement additional climate smart procurement reforms		✓	✓		✓	DEW and DTF *(with DIT, GISA and EPA)*
7.3	Explore innovative financing and investment approaches for adaptation and emissions reduction	✓		✓			DEW *(with DTF)*
7.4	Coordinate an across-agency government greenhouse gas emissions reduction program		✓			✓	DEW *(with all agencies)*
7.5	Develop and implement a government waste strategy		✓			✓	GISA *(with all agencies)*

Abbreviations

AGD	Attorney-General's Department
CCS	Carbon Capture and Storage
CFS	Country Fire Service
CPB	Coast Protection Board
DEM	Department for Energy and Mining
DEW	Department for Environment and Water
DIS	Department for Innovation and Skills
DIT	Department for Infrastructure and Transport
DPC	Department of the Premier and Cabinet
DTF	Department of Treasury and Finance
DTI	Department for Trade and Investment
EPA	Environment Protection Authority
GISA	Green Industries SA
ISA	Infrastructure SA
MFS	Metropolitan Fire Service
ODASA	The Office for Design and Architecture SA
PIRSA	Primary Industries and Regions SA
SAFECOM	South Australian Fire and Emergency Services Commission
SAHA	SA Housing Authority
SES	State Emergency Service
SMA	Stormwater Management Authority

Glossary of terms

Active travel

Making journeys by physically active means such as walking, cycling, skating, and skateboarding.

Climate change adaptation

The process of adjustment to actual or expected climate and its effects. Adaptation works to manage the risks caused by climate change already in train and those caused by potential future climate change.

Biodiversity

The variety of life in all its forms (plants, animals, fungi and micro-organisms), the communities that they form and the habitats in which they live.

Blue carbon

The carbon captured and stored in coastal ecosystems, including seagrass meadows, saltmarshes and mangroves.

Climate change

Change in weather patterns over long periods of time.

Carbon neutral

Emitting no net greenhouse gas emissions, in that the net emissions associated with an activity are equal to zero because all emissions have been reduced and/or offset.

Carbon sequestration

The removal of atmospheric carbon dioxide, either through biological processes (e.g. photosynthesis in plants) or geological processes (e.g. storage of carbon dioxide in underground reservoirs).

Carbon dioxide equivalent

A measure of greenhouse gas emissions that enables all greenhouse gases to be converted to the equivalent amount of carbon dioxide with the same global warming potential.

Carbon sink

Any natural or manufactured reservoir that absorbs more carbon than it releases and thereby lowers the concentration of carbon in the atmosphere. Natural carbon sinks include plants, soils and oceans.

Circular Economy

An alternative to the wasteful traditional 'linear' economy based on 'take, make, use and dispose'. A circular economy is a self-sustaining system driven by renewable energy with an imperative to keep material resources in use or 'circulating' for as long as possible.

Climate change mitigation

Efforts to reduce or prevent emissions of greenhouse gases to limit changes to the climate.

Climate smart

A deliberate and considered approach to growing our economy while becoming more climate resilient and reducing greenhouse gas emissions.

Ecosystem

A community of living organisms (plants, animals and microbes) in a particular area. The living and physical components are linked together through nutrient cycles and energy flows.

Ecosystem services

The direct and indirect contributions of ecosystems to human wellbeing, such as fresh water, pollination, pest control and climate regulation. Ecosystem services directly or indirectly support our survival and quality of life.

Emission intensity

The emission rate of greenhouse gas relative to the intensity of a specific activity or an industrial production process (e.g. grams of carbon dioxide released per megajoule of energy produced).

Greenhouse gas emissions

Atmospheric gases, such as carbon dioxide and methane, that trap and hold heat in the atmosphere, leading to global warming and climate change.

Green infrastructure

The network of green places and water systems that delivers urban cooling and other benefits to urban communities. This network includes parks and reserves, backyards and gardens, waterways and wetlands, streets and transport corridors, pathways and greenways, orchards, plazas, business and institutional green areas, roof gardens and living walls, sports fields and cemeteries.

Landscapes

Landscapes include the natural and built environment, natural resources, and the different ways people value and interact with their environment.

Liveability

A measure of quality of life that considers socio-economic, environmental, transport and recreational factors and is used to benchmark cities around the world.

Climate change mitigation

Efforts to reduce or prevent emissions of greenhouse gases to limit changes to the climate.

Natural resources

Natural resources include land, soil, water resources, native vegetation, animals and ecosystems.

Net emissions reduction

Emissions reduction in which some greenhouse gas emissions are balanced by additional carbon storage in carbon sinks; the more emissions are reduced, the less additional carbon storage will be needed.

Net zero emissions

Net zero emissions means that any remaining greenhouse gas emissions, after emissions are reduced, are balanced out by removal of an equivalent amount of carbon through additional carbon storage or carbon credits generated from a range of emissions reduction activities.

Resilience

The ability to survive, adapt and grow no matter what happens. This requires a community, business or natural environment to have the capability and capacity to prevent, withstand, respond to, and recover from a climate related disruption.

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