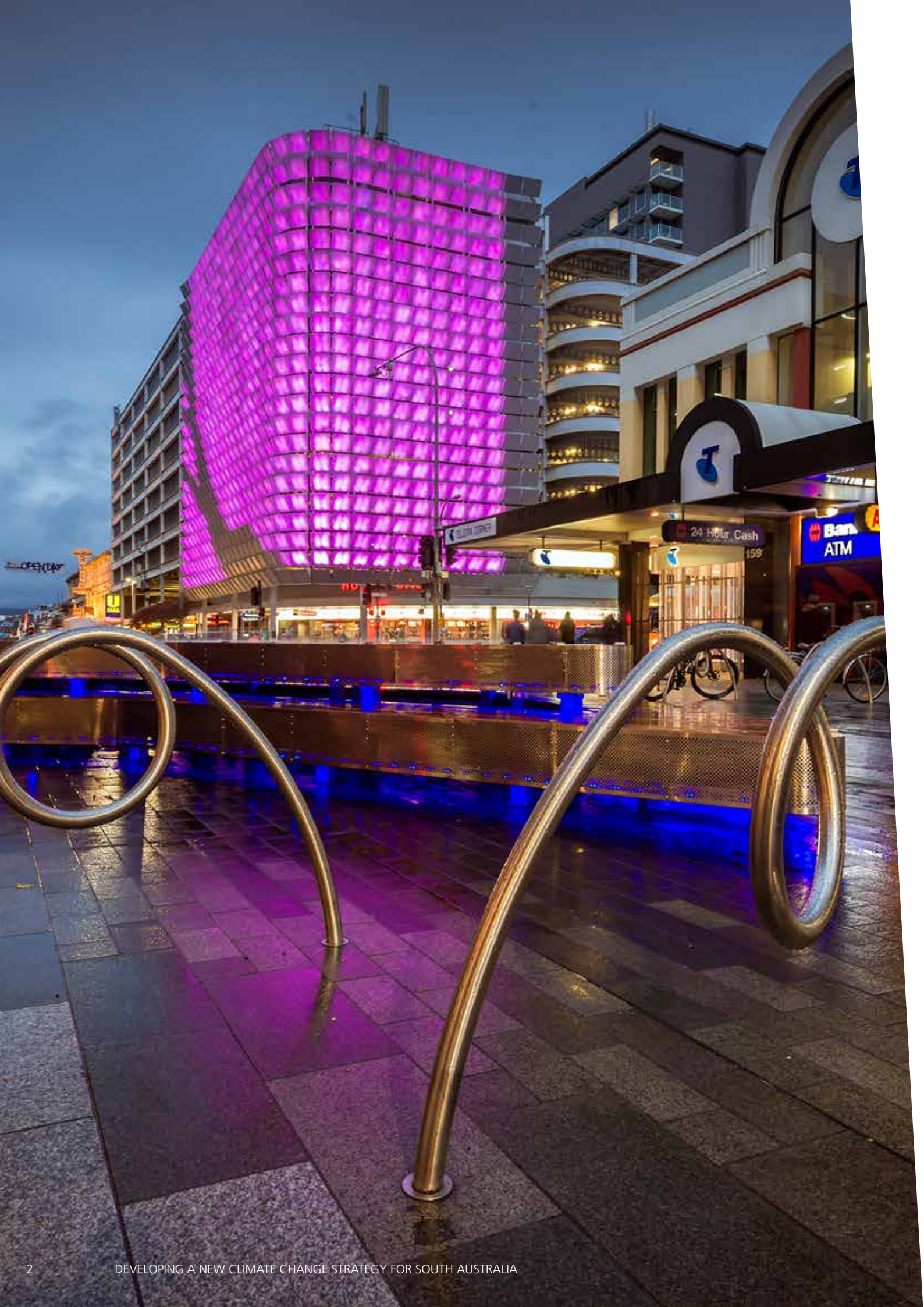


# DEVELOPING A NEW CLIMATE CHANGE STRATEGY FOR SOUTH AUSTRALIA

Overview consultation paper





## TOWARDS A LOW CARBON, CLIMATE RESILIENT FUTURE

Around the world, nations are transitioning to a low carbon future. Our trading partners and competitors, including China, India, the United States and Europe have accelerated efforts to reduce carbon pollution while also increasing renewable energy.

Closer to home, Australian States and Territories have seen the dividends in South Australia – jobs and investments – that renewable energy and other efforts to reduce carbon pollution have provided and are taking steps to boost renewables and build low carbon economies.

As a result of acting early, over \$6 billion has been invested in renewables and thousands of jobs have been created in our State. Since 1990 we have reduced our carbon pollution by 9 per cent while our State's economy has grown by 60 per cent.

Tackling the challenges presented by climate change allows us to help build a strong, prosperous State – one that is able to harness fully the opportunities offered by a low carbon economy.

We can be the showcase for what can be done and in doing so we can attract more investment for renewables, attract and foster new industries, and develop new technologies.

These opportunities include exporting expertise in clean tech development and climate change adaptation solutions to emerging international markets, taking advantage of our reputation for clean and green food and driving greater efficiency in our industries.

The Premier's Climate Change Council (PCCC) has already shown us what our State could be in 2050. In this vision, our dwellings are affordable and environmentally and thermally efficient; sustainability and prosperity measures provide new and better ways of doing things; our cities, towns and settlements are transformed into more attractive places to live, work and play through sustainable design and function; and we, as South Australians, are resilient and adaptable.

By working together, Government, community and industry, we can help make this a reality. The Government has as already announced that Adelaide will be the world's first carbon-neutral city – a beacon for renewables and clean technology. This will help create new jobs and build on the State's international reputation. We are delivering



more jobs in renewables and aim to have 50 per cent of our electricity generated from renewable sources by 2025, helping attract \$10 billion in low carbon investment.

The Government will build on this by working with business to see if we can change the way we buy things to ensure we reduce carbon pollution while boosting jobs.

In addition, we are ensuring the resilience of our state by partnering with regional leaders to deliver regional climate change adaptation plans under our internationally recognised and award winning adaptation framework. South Australia continues to lead international sub-national efforts and will be attending the United Nations Framework Convention on Climate Change 21st Conference of Parties in Paris in December this year.

Our actions to date have been guided by the Climate Change Strategy released in 2007 following extensive consultation with the South Australian community. Given international developments, changes to national climate policies, significant developments in technology and the urgency for action, it is timely that we review our strategy.

Reviewing and updating our Strategy allows us to reflect on our collective achievements and ensure that we are on the right path – and have the right settings in place – to harness the opportunities associated with transitioning to a low-carbon, climate resilient economy.

Your input is vital to this process, and we encourage all South Australians to participate in the development of a new Climate Change Strategy through this formal consultation process. This set of papers has been prepared to provide the background and context for the decisions that must be made.



**Jay Weatherill**  
Premier of South Australia



**Hon Ian Hunter MLC**  
Minister for Climate Change



# BACKGROUND

## ABOUT THIS DOCUMENT

This is the first of six complementary consultation papers prepared by the State Government to provide the background and set out the issues to be considered in the development of South Australia's new Climate Change Strategy.

This *Overview* document outlines the need for a new strategy, the guiding principles for its development, the science behind climate change, the reality of South Australia's current and future challenges in the face of climate challenge, and our activities and achievements to date in responding to these challenges.

The five other consultation papers are as follows:

### LEAD

- The international and national context within which South Australia has developed, and will continue to develop, its climate change strategy
- Achievements to date to meet the specific objects of the *Climate Change and Greenhouse Emissions Reduction Act 2007*, which is currently under review
- The role of the South Australian Government in taking action on climate change.

### REDUCE

- South Australia's greenhouse gas emissions profile
- Achievements to date in reducing emissions
- Potential opportunities to reduce emissions in specific industry sectors

### CARBON NEUTRAL ADELAIDE

- One of the Government's key emission reduction priorities, the Carbon Neutral Adelaide initiative.

### ADAPT

- The impact of climate change in South Australia
- Implementation of *Prospering in a Changing Climate - A Climate Change Adaptation Framework for South Australia*
- Proposed future priorities for assisting South Australians to adapt to the impacts of climate change.



## INNOVATE

- The economic opportunities arising from climate change action
- ‘Clean tech’ industries in the new carbon economy
- Opportunities for innovation across the South Australian economy
- The State Government’s approach to partnering with industry.

In addition, the State Government has developed a *Low Carbon Investment Plan for South Australia* strategy paper, which is designed to stimulate discussion about the strategies and initiatives to achieve the \$10 billion investment target in low carbon generation investment by 2025.

## ABOUT THE CONSULTATION PROCESS

The consultation process provides an opportunity for the community and stakeholders to have their say in the development of the new strategy.

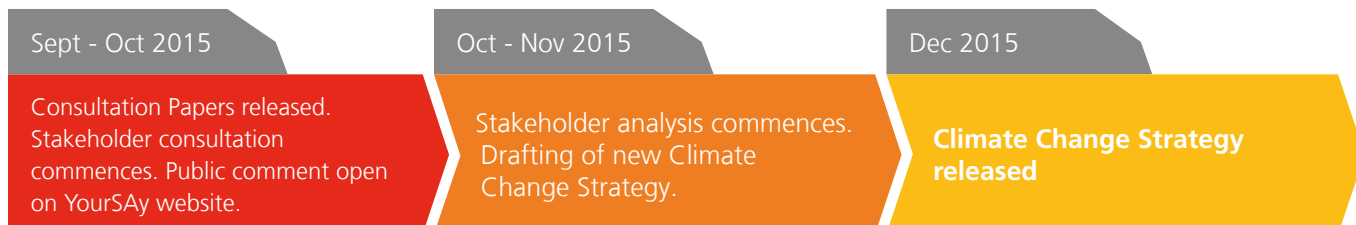
Submissions can be provided online via the State Government’s YourSAy website at [yoursay.sa.gov.au](http://yoursay.sa.gov.au).

Formal written submissions may also be mailed to DEWNR Climate Change, GPO Box 1047, Adelaide SA 5001.

Submissions close on 18 October 2015.

To help guide your submission, individual papers identify key consultation questions. An online discussion forum will also be available on the website.

Your input will help shape South Australia’s climate change strategy which will be released ahead of the Paris climate change conference in December 2015.



# DEVELOPING A NEW CLIMATE CHANGE STRATEGY





## THE NEED FOR A NEW STRATEGY

Many developments have occurred since South Australia's original climate change strategy was released in 2007. Scientific data and observations continue to affirm scientific consensus of the changes to the climate that are occurring as a result of a warming planet. The need for action has become more urgent. Technology and innovation present new opportunities. With a renewed focus on international and national action, it is timely for South Australia to position itself to harness the opportunities presented by transitioning to a low carbon, resilient economy.

South Australians continue to call on the Government to lead on climate change action. Recent research has shown that:

- Climate change is a top environmental concern for South Australians, with at least 64% extremely or quite concerned about the issue. However, people are unclear about the impact that they can really have.
- South Australians see the Australian Government as primarily responsible for addressing climate change (80%), but also feel industry/business (78%), the State Government (71%), householders/individuals (66%) and local government (62%) have a role to play.
- 59% of South Australians are aware that there are things they can do to reduce the impact of climate change, and householders are already active.
- 59% of South Australians are aware of the State Government's work in supporting the establishment of wind farms, solar energy and the renewable industry.
- It is also clear that more work needs to be done to increase public awareness of the work being undertaken by the Government and industry to address climate change.

## OUR VISION

The PCCC has outlined a vision for South Australia to be a low carbon, resilient economy in 2050. In this vision, dwellings are affordable and environmentally and thermally efficient. Renewable energy, water saving practices and distributed systems mean low energy bills and decreased water usage. Air quality has improved with less reliance on transport, lower industrial and vehicle emissions, technological advances, and integrated design of the built environment and transport infrastructure.

Sustainability and prosperity measures provide new and better ways of doing things. Innovation in managerial, operational and technological advancements boost the State's competitive edge, generate new products and enable entry into new markets in the dominant overseas markets of China, Brazil and India. 3D printing, robotics and drones have revolutionised the manufacturing and service industries and people work in jobs that were not yet thought of in the early part of the century.

The State's cities, towns and settlements are transformed into more attractive places to live, work and play through sustainable design and function. The urban sprawl is limited through smart planning and social policies. Better use is made of developed land and valuable agricultural land, biodiversity and water resources are preserved. Ambitious business ventures and innovation are supported by new business models, and a workforce skilled in management, design, marketing, software and logistics. Investment in education, skills and research focus on global Asian markets that were emerging in the first two decades and create a sustainable and prosperous state by ensuring a balance between the economic, ecological, social and cultural dimensions.

South Australia's people are resilient and adaptable. Individuals are well connected to their communities – they find local solutions and have consumer patterns and lifestyle choices that ensure resources are shared more equitably. South Australians continue to enjoy what they have always loved about living in South Australia – the lifestyle, the landscape and the culture.

South Australia is proud of the foresight and commitment shown in the early part of the century by its leaders, businesses and community, who were determined to leave a positive legacy for their children and grandchildren.

## GUIDING POLICY PRINCIPLES

The following principles will guide the Government's approach to developing the new Climate Change Strategy:

### **Leadership**

We are committed to demonstrating strong and focussed leadership on climate change, which includes being at the forefront of emerging market opportunities and participating in national and global networking forums.

### **Action**

We recognise that the benefits of strong and prompt action to address climate change far outweigh the economic costs of not acting. We prioritise actions that result in tangible, measurable outcomes.

### **Scientific evidence**

We are informed by the latest science as accepted by the mainstream scientific community and by governments internationally.

### **Cost-effective, best practice measures**

Drawing on national and international best practice and expertise, we prioritise efficient and effective policies that are low cost, have co-benefits and leverage existing funding sources. Preference is given to market based mechanisms that are recognised internationally as the most cost effective way to reduce greenhouse gas emissions.

### **Coherent, consistent policy**

Governments must work together to deliver a coherent, consistent national response to the widespread challenge of climate change.



We believe the South Australian Government has an important advocacy role to play in ensuring nationally consistent climate change policy that is adequate to achieve Australia's legally binding emissions reduction targets. The decisions we make are informed by evidence and manage risk with long-term considerations that provide certainty for government and private sector decision making.

### **Consultation**

We make better decisions by bringing the voices of communities and stakeholders into the issues that are relevant to them.

### **Competitive advantage**

We recognise the importance of competitive advantage within our industry sectors and are committed to developing policies that will capture optimal climate change and competitiveness outcomes. We are committed to creating an investment environment that promotes new economic opportunities, including emergent industries, technologies and markets.

### **Environmental and social impacts**

We consider the environmental and social impacts of our policies to build the resilience of the entire community, ensure that low carbon choices are accessible to all and that natural ecosystems are able to thrive.



# THE SCIENCE OF CLIMATE CHANGE

“Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history.

Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen.”

*Intergovernmental Panel on Climate Change, 2014*

The latest authoritative scientific consensus reinforces the link between atmospheric concentrations of greenhouse gases such as carbon dioxide and increases in global surface and ocean temperatures which in turn influence changes in our climate system. Human activities – notably the combustion of fossil fuels for energy, the clearing of forests and changes in land use – have been the main driver of global warming and climate change in recent decades<sup>1</sup>.

Globally, atmospheric carbon dioxide (CO<sub>2</sub>-e) levels are the highest they have been for 800,000 years at 400.47 parts per million (ppm) as at June 2015<sup>2</sup>. The 14 warmest years on record have occurred this century<sup>3</sup>. Since 1880, the global average temperatures across land and ocean have risen 0.7 degrees Celsius above the 20th century average, with 2014 the warmest year on record<sup>4</sup>. Records continue to be set. Globally the first seven months of 2015 have been the warmest on record<sup>5</sup>.

Many of the observed changes in the climate system since the 1950s are unprecedented over decades to millennia and the observed impacts of these temperature rises include increases in mean sea level, increases in ocean acidity, and increases in the frequency and intensity of drought conditions and extreme weather events such as storm surges and flood events.

## AUSTRALIAN CONTEXT

According to the latest data provided by Australia’s Bureau of Meteorology (BoM) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia’s climate has already changed. Since 1910, more hot days have been recorded than cold days, with an overall warming of 0.9 degrees Celsius. Since the 1970s, northern Australia has experienced increases in rainfall while in south-eastern and south-western Australian average rainfall has declined. There have been more instances of extreme fire weather in southern and eastern Australia and sea levels have risen by approximately 20cm since 1900<sup>6</sup>.

Key projections for Australia’s climate include:

- Average temperatures are likely to increase, including an increase in extreme temperature events
- Average rainfall levels are predicted to decrease in Southern Australia, while time in drought is likely to increase
- Rainfall is expected to increase in the tropics, including increased frequency and intensity of extreme events (such as cyclones)
- Sea levels will continue to rise further and oceans will become more acidic
- Southern and Eastern Australia are likely to experience harsher fire weather conditions.

<sup>1</sup> Intergovernmental Panel on Climate Change, 2014.

<sup>2</sup> National Aeronautical and Space Administration (NASA), 2015.

<sup>3</sup> World Meteorological Organisation, 2015.

<sup>4</sup> National Aeronautical and Space Administration (NASA), 2015.

<sup>5</sup> US National Oceanic and Atmospheric Administration (NOAA), 2015.

<sup>6</sup> Bureau of Meteorology and CSIRO, 2014

## SOUTH AUSTRALIA'S CHANGING CLIMATE

While South Australia's climate has always been highly variable, a strong warming trend has been observed since the 1970s that is consistent with international warming projections. Average temperatures across the state have warmed almost 1 degree Celsius over the past century<sup>1</sup>. Rainfall records since 1900 show that rainfall across South Australian regions varies seasonally, annually and over decades. Since the 1990s a decline in rainfall, particularly within the agricultural districts of the state between April-October, has been experienced however given the natural range of rainfall variability, trends are less clear than those for temperature and sea level rise<sup>2</sup>. Sea level rise of between 4.7mm and 4.9mm per year has been recorded in South Australia since 1992<sup>3</sup>.

South Australia is particularly vulnerable to the adverse impacts arising from climate change. Climate change is likely to impact upon the community, our natural and built environments and more broadly, industry and economic productivity. These impacts will be borne from events such as heatwaves, extreme weather and natural hazards, which are likely to become more prevalent as our climate continues to change. This presents a variety of social and economic challenges which must be managed by adequately engaging, informing and empowering all representative community and stakeholder groups to take action by adapting.

More detailed information about climate change in South Australia can be found in the *Adapt* paper.

<sup>1</sup> Bureau of Meteorology, 2015

<sup>2</sup> Bureau of Meteorology and CSIRO, 2014

<sup>3</sup> Bureau of Meteorology, 2015



## PROGRESSING CLIMATE CHANGE ACTION IN SOUTH AUSTRALIA

### SA KEY CLIMATE CHANGE TARGETS

**Target:** Reduce emissions by 60% of 1990 levels by 2050

**Status:** Net emissions down by 9% in 2012/13



**Status:** Gross State Product is up 60% since 1990



**Target:** Generate 50% of the state's electricity from renewable sources by 2025

**Status:** 39% of electricity generated from renewables in 2013/14



South Australia has continued to take action on climate change despite changes in the national climate change and economic policy environment.

The *Climate Change and Greenhouse Emissions Reduction Act 2007* made South Australia the first Australian jurisdiction to enact specific climate change legislation that set a long-term emissions reduction target. Under this legislation, South Australia set a target to reduce greenhouse gas emissions by at least 60% of 1990 levels by 31 December 2050, renewable energy consumption and generation targets of 20% by 2014, and established the Premier's Climate Change Council (PCCC), a key advisory body to the Minister for Climate Change on climate change action. The renewable energy generation target was subsequently increased to 33% renewable energy generation within the state by 2020. Further information about achievements specific to the objects of the Act can be found in the *Lead* paper.

The latest estimate of South Australia's greenhouse gas emissions indicates that in 2012/13 net greenhouse gas emissions in South Australia were 9% lower than the 1989/90 baseline. During this time Gross State Product grew by 60%.

South Australia has led the nation in the uptake of renewable energy, growing from near zero in 2003 to 1,473 megawatts in wind and 565 megawatts in rooftop solar to date. In 2014, 39% of the state's electricity generation was from renewable sources, and there is now a new target to generate 50% of the State's grid electricity from renewable energy sources by 2025.



The Government has set a \$10 billion low carbon generation investment target by 2025. For the period 2003-2015, there has been \$6.6 billion investment in renewable energy generation in South Australia, with around 40% realised in regional areas.

The Government has taken a strategic approach to attracting this investment, capitalising on national policy settings such as the Federal Renewable Energy Target by being an early mover and putting in place the most supportive regulatory frameworks for renewable energy development in Australia.

South Australia was the first Australian jurisdictions to provide a premium feed-in tariff mechanism to support the installation of solar photovoltaic systems. This scheme commenced on 1 July 2008 and, whilst it is now closed to new entrants, it was an important stimulus for the sector with 1 in 4 South Australian households now having solar photovoltaic systems. South Australia was also the first jurisdiction in Australia to introduce planning guidelines for wind farms in 2003.

The State Government has supported the development of high quality information to inform investment decision making, such as wind resource and solar resource mapping, which have been used by potential investors to inform site selection investigations. The State Government has also led by example, being an early adopter of solar panels, with installations on major public buildings on North Terrace, support for the 1MW solar installation on the Adelaide Showgrounds (at the time the largest in Australia), and the mandating of solar panels on new and refurbished government buildings.

The release of the State Government's Low Emission Vehicle Strategy 2012-16 (LEVS) also demonstrates a commitment to reducing the greenhouse emissions intensity of the transport sector within South Australia, including the Government's own vehicle fleet.

In August 2012, the Government released *Prospering in a Changing Climate: A Climate Change Adaptation Framework for South Australia* developed in close consultation with the community, local government and regional stakeholders. The framework provides the foundation for South Australians to develop well-informed and timely actions to increase their preparedness for the impacts of climate change. Under the framework, the State Government has committed to delivering regional climate change adaptation plans across the State.

Founded on collaboration, the approach is a partnership between local communities and decision-makers, local and state government, and the private sector. The approach has received state and national recognition for the innovative practices and achievements that are making communities more resilient. Its success has been due predominantly to the regionally-driven approach and the significant commitment of local leaders across sectors to address the impacts of climate change on their communities.

# SOUTH AUSTRALIAN CLIMATE CHANGE ACTION

## INTERNATIONAL / NATIONAL DEVELOPMENTS

<b>2001</b> Mandatory Renewable Energy Target commences	<b>2007</b> <i>National Greenhouse and Energy Reporting Act</i> gains assent	<b>2008</b> Carbon Pollution Reduction Scheme Green Paper released  Garnaut Climate Change Review final report released  Kyoto Protocol signed by Australia	<b>2009</b> National Strategy on Energy Efficiency released  Renewable Energy Target (RET) expanded to generate at least 20% of national grid electricity by 2020	<b>2011</b> Garnaut Review Update released	<b>2012</b> National Carbon Pricing Mechanism commences  Australian Renewable Energy Agency (ARENA) commences operation  Productivity Commission releases 'Barriers to Effective Climate Change Adaptation' report  <i>Greenhouse &amp; Energy Minimum Standards (GEMS) Act</i> commences
--	---	--	--	---	--

## SOUTH AUSTRALIAN MILESTONES

**2003-05**



First wind farm constructed at Starfish Hill



Energy efficiency program for low-income households



Herbert Girardet's 'Creating a Sustainable Adelaide' report



Tackling Climate Change Summit in South Australia



Montreal Declaration signed committing to climate change action and target setting

**2006**



South Australia urges COAG to streamline greenhouse gas and energy reporting



The late Stephen Schneider's 'Climate Change: Risks and Opportunities' report released

**2007**



Inaugural Sir Hubert Wilkins Chair of Climate Change appointed



'Tackling Climate Change – South Australia's Greenhouse Strategy 2007 - 2020' launched



*Climate Change and Greenhouse Emissions Reduction Act* enacted



'Black Balloons' awareness raising campaign commences

**2008**



Inaugural Premier's Climate Change Council (PCCC) established



Solar Feed-in legislation commences



Building Innovation Fund begins four year operation



New water heater energy efficiency installation standards



First Climate Change Sector Agreement established with industry



Container deposit levy increased to 10 cents

**2009**



Residential Energy Efficiency Scheme commences



Solar panels weighing less than 100 kilograms no longer required to apply for planning or building approval



Plastic bag ban in SA begins



RenewablesSA established



'Water for Good' plan released to diversify water supply

**2010**



'30 Year Plan for Greater Adelaide' launched, providing for a low carbon future



Green Hubs – climate change community grants launched in partnership with the Conservation Council of SA



SA Renewable Energy payroll tax rebate for large wind and solar projects commences



Goyder Institute established, including researching the effects of climate change on water supplies



Adopted 6-star energy efficiency rating for new housing in the Building Code of Australia



Commenced target bans to landfill, including white goods, vehicles and aggregated organic material



New target for the greenhouse gas efficiency of government vehicles established



Water efficient taps and showerheads for government projects

## 2013

Clean Energy Finance Corporation (CEFC) commences operation

Regional Natural Resource Management Planning for Climate Change Program commences

## 2014

National Carbon Pricing Mechanism is repealed

Emissions Reduction Fund (ERF) introduced

## 2015

Climate Change Authority releases 'Special Review: Australia's Future Emissions Reduction Targets' report

ERF commences with first auction

Australia's Intended Nationally Determined Contribution (INDC) submission

United Nations Framework Convention on Climate Change (UNFCCC) 21<sup>st</sup> Conference of Parties in Paris – Universal Agreement on Climate Change

## 2011



Introduced state specific energy efficiency requirements for air-conditioners



Bowden Village 'sustainable community' development approved



First regional water demand and supply statement released incorporating climate change impacts



First regional Climate Change Sector Agreement established



Renewable Energy Plan for South Australia launched

## 2012



South Australia achieves its Kyoto emissions reduction commitment target



Low Emissions Vehicle Strategy released



Climate Change Adaptation Framework, 'Prospering in a Changing Climate' launched



Works begin on the Sustainable Industries Complex at Tonsley Park redevelopment



Statewide Wind Farm Development Plan Amendment approved



Major upgrades and electrification to Adelaide Metro rail commences

## 2013



First regional Climate Change Adaptation Plan released



'2013 State of the Environment' report, featuring a dedicated chapter to climate change



National 'Greenhouse 2013' conference held in Adelaide



South Australia's Climate Change Adaptation Program wins two national awards

## 2014



PCCC 'South Australia's Climate Change Vision: Pathways to 2050' released



South Australia generates 39% of its electricity from wind and solar



New 50% renewable energy generation target by 2025 announced



South Australia achieves a 27% reduction of waste to landfill since 2002 / 2003



South Australia re-elected as Co-chair of The Climate Group – States and Regions Alliance



*Pastoral Land Management and Conservation (Renewable Energy) Amendment Act 2014* passes Parliament



Clean Energy Summit held in Adelaide

## 2015



Retail Energy Efficiency Scheme commences



Goyder Institute releases climate change projections for South Australia



Building Upgrade Finance legislation tabled in Parliament



Plan to make the City of Adelaide the world's first carbon neutral city



Tonsley redevelopment awarded 6 star Green Star - Communities certification by the Green Building Council of Australia



Signed International Agreement – Compact of States and Regions



South Australia wins two awards – United Nations Association of Australia 2015 World Environment Day Awards



South Australia hosts Jurisdictional Meeting on Climate Change with States and Territories attended by Executive Secretary of UNFCCC

## THE NEXT STEPS

South Australia must recognise and pursue opportunities that will help the State to become a low carbon economy, which is well adapted to the expected changes in our climate. Industry has a lead role to play in this, however a constructive approach is needed also to form partnerships between business, government, research institutions and the community. This approach will be central to the development of South Australia's new Climate Change Strategy.

In addition, our transition to the efficient use of zero or renewable energy for electricity generation and transport is at the core of achieving a low carbon economy. Embedding climate change into the mainstream decision making and policy development is a crucial element to enable this to happen.

The new Climate Change Strategy will collate the views and ideas of Government, stakeholders and the community in order to develop a comprehensive policy framework for Climate Change action in South Australia, with the outcome of achieving future prosperity in the low carbon economy.

## REFERENCES

Australian Government Department of the Environment. (2015). *Australian National Greenhouse Accounts: State and Territory Gas Inventories 2012-13*. Canberra: Commonwealth of Australia.

Bureau of Meteorology & CSIRO. (2014). *State of the Climate Report 2014*. Canberra: Commonwealth of Australia.

Bureau of Meteorology. (2015). *Monthly Data Report: Australian Baseline Sea Level Monitoring Array – July 2015*. Bureau of Meteorology.

Bureau of Meteorology. (2015). *Climate Change and Variability*. Retrieved from Bureau of Meteorology website: [http://www.bom.gov.au/climate/change/index.shtml#tabs=Tracker&tracker=timeseries&tQ%5Bgraph%5D=t-mean&tQ%5Barea%5D=sa&tQ%5Bsea-son%5D=0112&tQ%5Bave\\_yr%5D=0](http://www.bom.gov.au/climate/change/index.shtml#tabs=Tracker&tracker=timeseries&tQ%5Bgraph%5D=t-mean&tQ%5Barea%5D=sa&tQ%5Bsea-son%5D=0112&tQ%5Bave_yr%5D=0)

Intergovernmental Panel on Climate Change. (2014). *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva: Intergovernmental Panel on Climate Change.

National Aeronautical and Space Administration (NASA). (2015, February). *Global Climate Change: Vital Signs of the Planet 2015*. Retrieved from NASA: <http://climate.nasa.gov>

World Meteorological Organisation. (2015). Retrieved from Warming Trend Continues in 2014: <https://www.wmo.int/media/?q=content/warming-trend-continues-2014>



## GLOSSARY & ACRONYMS

### BATTERY STORAGE

An electrical device that has capability to store generated electricity from a variety of generating sources including solar and wind.

### BIODIVERSITY

The variety of life forms: the different plants, animals, fungi, bacteria and other microorganisms, the genes they contain, and the ecosystems they form. It includes the ecological and evolutionary processes through which genes, species and ecosystems interact with one another and with their environment.

### BIO-ENERGY

Biofuel or bioenergy is any fuel that is derived from biomass—recently living organisms or their metabolic byproducts, such as manure from cows. It is a renewable energy source, unlike other natural resources such as petroleum, coal and nuclear fuels. Biosources is shorthand for energy resource sources derived from biomass. Biodiesel refers to a diesel-equivalent, processed fuel derived from biological sources.

### BUREAU OF METEOROLOGY (BOM)

Australia's national weather, climate and water agency.

### CARBON DIOXIDE EQUIVALENT (CO<sub>2</sub>e)

An internationally accepted measure that encapsulates all of the different greenhouse gases. Each of the gases has a different 'global warming potential' in terms of an equivalent amount of carbon dioxide (the major greenhouse gas). Methane, for example, has a global warming potential 21 times that of carbon dioxide — so one tonne is included in the accounts as 21 tonnes of CO<sub>2</sub>-e.

### CARBON NEUTRAL

Net greenhouse gas emissions are zero. This can be achieved by preventing or offsetting emissions (e.g. by supporting a tree planting scheme that will absorb carbon dioxide, or a combination of the two).

### CARBON NEUTRAL ADELAIDE

A South Australian Government initiative to enable the City of Adelaide to become a carbon neutral city.

### CLEAN TECH

A description relating to products, services and processes that can optimise operational performance and productivity, reduce the necessity for natural resource exploitation and cut or eliminate emissions and wastes.

### CLIMATE CHANGE

Any change in climate over time, whether due to natural variability or as a result of human activity.

### CLIMATE CHANGE ADAPTATION

Action in response to, or anticipation of, climate change to reduce or avoid adverse consequences or to take advantage of beneficial changes. Adaptation is usually distinct from actions to reduce greenhouse gas emissions.

### CLIMATE CHANGE AUTHORITY (CCA)

An Australian independent Authority who provides expert advice on Australian Government climate change mitigation initiatives.

### CLIMATE CHANGE AND GREENHOUSE EMISSIONS REDUCTION ACT 2007

South Australian legislation to provide for measures to address climate change by setting targets to achieve a reduction in greenhouse gas emissions within the State; to promote the use of renewable sources of energy; to promote business and community understanding about issues surrounding climate change and to facilitate the development of policies and programs to address climate change.

### CARBON PRICING

A system where a monetary charge is applied to the right to emit a unit of carbon, taking the form of a *permit*. The carbon price can be determined by a regulator or the open market via the trading of permits.

## CLIMATE SYSTEM

A highly complex system consisting of the atmosphere, the water cycle, ice, snow and frozen ground, the land surface and plants and animals, and the interactions between them.

## COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION (CSIRO)

The federal government agency for scientific research in Australia.

## DECILE

Each of ten groups into which a population can be divided according to the distribution of values of a particular variable.

## ENERGY EFFICIENCY

The ratio of energy required to produce a certain level of a service such as kilowatt per unit of heat or light.

## FEED-IN TARIFF

A payment made to household or businesses that generate their own electricity through means such as solar photovoltaic panels.

## FOSSIL FUELS

Fuels formed by natural processes under the ground over millions of years. They often contain high percentages of carbon, such as coal, petroleum and natural gas.

## GREENHOUSE GAS EMISSIONS

The release of greenhouse gases into the atmosphere. A greenhouse gas is an atmospheric gas that absorbs and emits infrared or heat radiation, giving rise to the greenhouse effect. Typical greenhouse gases include carbon dioxide, methane, nitrous oxide and refrigerants.

## GREENHOUSE GAS EMISSIONS BASELINE

The starting measurement by which future measurements of greenhouse gases are based on.

## INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)

The scientific intergovernmental body under the auspices of the United Nations, established in 1988 by the World Meteorological Organisation (WMO) and the United Nations Environment Program (UNEP) at the request of member governments. The IPCC produces reports that support the United Nations Framework Convention on Climate Change (UNFCCC).

## LAND USE, LAND USE CHANGE AND FORESTRY (LULUCF)

A sector of a greenhouse gas inventory that covers emissions and removals of greenhouse gases resulting from direct human-induced land use, changes in land use change and forestry activities.

## LOW CARBON ECONOMY

An economy based on low carbon power sources that therefore has a minimal output of greenhouse gas (GHG) emissions.

## LOW CARBON INVESTMENT PLAN

A South Australian Government initiative towards \$10 billion investment in low carbon energy generation by 2025 and 50 per cent of electricity production by renewable energy by 2025.

## MEGATONNE (MT)

A unit of measurement, expressed as a million tonnes.

## MEGAWATT (MW)

A unit of electricity equal to one million watts, particularly used as a measure of the output of a power station.

## OCEAN ACIDITY

The ongoing decrease in the pH of the world's oceans, caused by the uptake of CO<sub>2</sub> in the Earth's atmosphere, much of which is dissolved and absorbed in the ocean.

## PASTORAL CROWN LAND

Land that is owned by the State Government, within the pastoral districts (arid lands) of South Australia.

## PREMIER'S CLIMATE CHANGE COUNCIL (PCCC)

The Premier's Climate Change Council was established under the *Climate Change and Greenhouse Emissions Reduction Act 2007*. The primary function of the Council is to provide independent advice to the Minister responsible for Climate Change about matters associated with reducing greenhouse gas emissions and adapting to climate change.

## *PROSPERING IN A CHANGING CLIMATE: A CLIMATE CHANGE ADAPTATION FRAMEWORK FOR SOUTH AUSTRALIA*

Sets out the foundation for South Australians to develop well-informed and timely actions to be better prepared for the impacts of climate change.

## RAINFALL VARIABILITY

The degree to which rainfall amounts vary spatially and temporally.

## RENEWABLE ENERGY

Energy that comes from resources which are naturally replenished on a human timescale such as sunlight, wind, rain, tides, waves, and geothermal heat.

## RENEWABLE ENERGY TARGET (RET)

A policy which mandates a percentage of the electricity purchased by a retailer to be sourced from renewable energy generation. A generator is provided with certificates by the Clean Energy Regulator, which are 'surrendered' upon the sale of this energy. The intent of the RET is to encourage investment into new renewable energy sources.

## SEA LEVEL RISE

The rise in the average level of an ocean for which heights can be measured.

## SOLAR ENERGY

The harnessing of the radiant light and heat from the sun using a range of technologies such as photovoltaic (panels) or thermal power generation in order to produce electricity.

## *SOUTH AUSTRALIA'S CLIMATE CHANGE VISION: PATHWAYS TO 2050*

The official advice presented to the Minister for Climate Change by the Premier's Climate Change Council (PCCC) in February 2014.

## UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

The international treaty that sets general goals and rules for confronting climate change. It has the goal of preventing dangerous human interference with the climate system.

## WIND ENERGY

A form of electricity generation using wind turbines to extract electrical power from air flow.



[www.environment.sa.gov.au/climatechange](http://www.environment.sa.gov.au/climatechange)