

DEVELOPING A NEW CLIMATE CHANGE STRATEGY FOR SOUTH AUSTRALIA

Lead consultation paper





INTRODUCTION

The South Australian Government has been a leader in taking action to respond to climate change because it recognises that the State has a responsibility to contribute its 'fair share' of emissions reduction and other activities required as part of a genuine global response.

It is not only the right thing to do; it also offers significant potential benefits. In taking a leadership role and transitioning to a low carbon economy, South Australia can strategically position itself to capitalise on opportunities arising from global action on climate, particularly with emerging economies such as China and India.

The Government also recognises that it has a role and responsibility to provide, in an accessible and useable manner, information that individual South Australians require to understand the issues, participate in discussion, and make appropriate business and lifestyle choices in relation to emissions reduction and climate change adaptation.

This paper sets out:

- The international and national context within which South Australia has developed, and will continue to develop, its climate change strategy
- The role of the South Australian Government in taking action on climate change
- 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 non-government sectors.

Community input is welcomed on any issues raised within this paper, in particular in relation to:

- Changes that should be made to the Act and its objectives
- The role of the South Australian Government in tackling climate change
- Further actions or changes that would help South Australian businesses, industry and the community better contribute to the state's commitment to reduce greenhouse emissions and adapt to climate change
- What further information should be provided to assist with individual decision-making
- Which individuals or organisations should be canvassed to develop effective partnerships to drive climate change action
- Whether the use of Sector Agreements under the Act are effective in facilitating these partnerships
- What particular sectors are currently doing to reduce their greenhouse gas emissions, adapt to climate change and seize the opportunities that are emerging.



BACKGROUND

South Australia's leadership on climate change largely involves maximising the effectiveness of the *Climate Change and Greenhouse Emissions Reduction Act 2007* (the Act), assuming an advocacy role on climate change issues and collaborating with other governments domestically and internationally.

The Premier's Climate Change Council (PCCC) released its advice, *South Australia's Climate Change Vision: Pathways to 2050* in February 2014. In this vision, the PCCC foresees a low carbon South Australia that is adapting to climate change and embracing the opportunities it presents. It proposes that all South Australians share responsibility for transitioning our State and our economy. Importantly, it maps out a role for the South Australian Government in facilitating this transition.

South Australia's climate change strategy and achievements to date are explored in detail in the *Overview* paper. Some of the key achievements to date include:

- Establishing climate change legislation, including an emissions reduction target
- Reducing net greenhouse gas emissions by 9% since 1990 while growing the State's economy by 60%.
- Generating almost 40% of the State's electricity from renewable energy
- Developing an adaptation framework for the State and associated regional adaptation plans.

The purpose of this paper is to stimulate discussion on how South Australia can continue to demonstrate effective leadership.



INTERNATIONAL CONTEXT

THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

Global governance of the response to climate change is through the United Nations Framework Convention on Climate Change (UNFCCC), an international environmental treaty signed by 195 countries¹, including Australia, with an objective to stabilise greenhouse gas concentrations at a level that would prevent dangerous human-induced interference with the climate system. The work of the UNFCCC is underpinned by the latest research and expert knowledge collated and synthesised by the Intergovernmental Panel on Climate Change (IPCC).

The UNFCCC puts the onus on industrialised nations such as Australia to lead on climate change action. In 1997, the Kyoto Protocol was adopted² under the UNFCCC, committing industrialised countries party to the agreement to binding emissions reduction targets. Australia became a party to the Kyoto Protocol in 2008 and met its target of limiting emissions to 108% of 1990 levels, on average over the Kyoto period 2008-2012. Over that period, Australia's net emissions averaged 103% of the base year level. South Australia's emissions averaged 91% of the base year level.

Parties to the UNFCCC have agreed in-principle to develop a new universal agreement on climate change to be negotiated at the 21st Session of the Conference of Parties (COP 21), to be held in Paris in December 2015. To support negotiations, the

Australian Government and other countries have committed to outline their post 2020 greenhouse gas emissions reduction targets (known as Intended Nationally Determined Contributions) in advance of COP 21. The Australian Government has announced it will establish an unconditional target to reduce Australia's greenhouse gas emissions by 26-28 percent from 2005 levels by 2030. This target will have implications for South Australia achieving its own state-specific target.

INTERNATIONAL COMMITMENTS AND DEVELOPMENTS

Progress towards limiting greenhouse emissions is gathering pace ahead of the Paris Conference. Major emitters, including key economic and trade partners of Australia, have announced pledges to reduce emissions. In November 2014, the United States and China in an historic joint press conference, announced their respective post-2020 commitments under the UNFCCC.

The United States will adopt an economy-wide emissions reduction target of 26-28% below 2005 levels by 2025, making its best efforts to reduce its overall greenhouse gas emissions by 28%. Analysts have estimated this equates to a 41% reduction by 2030.

1 There are currently 196 parties to the United Nations Framework Convention on Climate Change, including 195 Nation States and 1 regional economic integration organisation.

2 The Kyoto Protocol entered into force in 2005

China intends to reduce the greenhouse gas emissions intensity of its economy by 60-65% of 2005 levels by 2030 and achieve the peaking of greenhouse gas emissions at around 2030, making its best efforts to peak earlier. In addition, China intends to increase the share of non-fossil fuels in primary energy consumption to around 20% by 2030.

India, the world's third largest greenhouse gas emitter, realises the necessity to act on climate change and has set an investment target of at least \$100 billion in renewable energy development, with the aim of establishing a generating capacity of 175 gigawatts (GW) by 2022. This is more than three times larger than Australia's present generating capacity in the National Electricity Market (NEM). India's installed solar energy capacity is targeted to grow 33 times to 100 GW, wind power to 60 GW and a further 15 GW from hydro and biomass. In addition, India is committed to reducing the greenhouse emissions intensity of its economy by 20-25% relative to 2005 levels, excluding the agricultural sector.

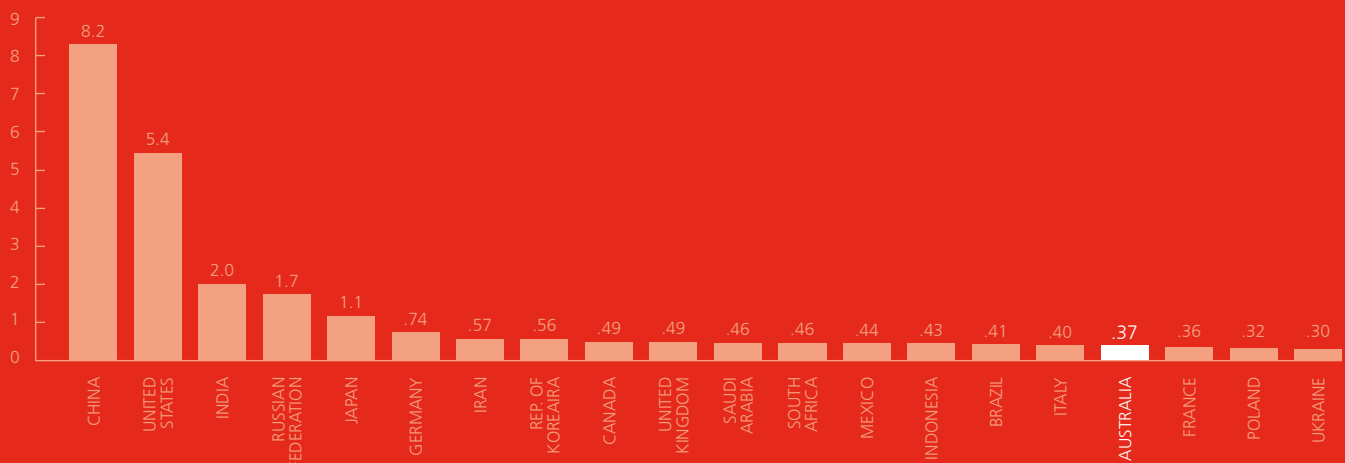
THE CLIMATE GROUP'S STATES AND REGIONS ALLIANCE

The Climate Group, an international, independent, not-for-profit organisation, works with corporate and government partners to develop climate finance mechanisms, business models that promote innovation, and supportive policy frameworks aimed at reducing global greenhouse gas emissions and adapting to the impacts of climate change.

South Australia is a founding member of The Climate Group's States and Regions Alliance and its longest-standing co-chair. In this role, the Premier acts as a climate ambassador for the Asia Pacific region to support efforts to build strong sub-national climate leadership by speaking publicly on behalf of the Alliance and promoting global climate programs and action.

The Alliance has 27 active members across over 50 sub-national governments (The Climate Group, 2015). The other current co-chairs are the Basque Country (Spain) and Quebec (Canada), representing Europe and the Americas respectively.

HIGHEST NET GREENHOUSE GAS EMISSIONS BY COUNTRY 2011



Highest net greenhouse gas emissions by country expressed as gigatonnes of carbon dioxide equivalent (CO₂e) 2011
Source: World Bank (2015)

Nation	Greenhouse emissions reduction commitment*
China	<ul style="list-style-type: none"> • A peaking of emissions by 2030 at the latest • 60-65% reduction in emissions intensity per unit of GDP on 2005 levels by 2030 • Increase share of non-fossil fuel energy to approximately 20% by 2030
United States	<ul style="list-style-type: none"> • 26-28% reduction in emissions below 2005 levels by 2025
India	<ul style="list-style-type: none"> • Reduce emissions intensity per unit of GDP by 20-25% on 2005 levels (excluding agriculture) • Renewable energy target of 175GW by 2022
South Korea	<ul style="list-style-type: none"> • 37% emissions reduction on business as usual levels by 2030
European Union	<ul style="list-style-type: none"> • 40% emissions reduction below 1990 levels by 2030

Figure 2 - Greenhouse gas emission reduction commitments of Australia's main trade partners

COMPACT OF STATES AND REGIONS

The *Compact of States and Regions* was announced at the United Nations Climate Summit in New York on 23 September 2014, as a joint initiative of the Network of Regional Governments for Sustainable Development (nrg4SD), the R20 Regions of Climate Action and The Climate Group's States and Regions Alliance, in partnership with CDP³. It is a commitment by sub-national governments to provide an annual report on their greenhouse gas reduction targets and progress towards those targets in a standardised format to enable comparisons across regions in order to support international climate governance processes.

South Australia signed up to the Compact in early 2015. At the World Summit – Climate and Territories held in Lyon, France, the Premier presented the first reporting period of the Compact, which includes 20 sub-national governments representing 220 million people, US\$8.3 trillion GDP and 5% of global greenhouse gas emissions (The Climate Group, 2015).

The reporting requirements of the Compact are consistent with the information compiled for biennial reporting under section 7 of the *Climate Change and Greenhouse Emissions Reduction Act 2007*. This information is sourced from the Australian Government each year as part of the National Greenhouse Gas Inventory (NGGI). Every second report under section 7 (every four years) contains a report by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to assess progress against the renewable energy generation and greenhouse gas emissions reduction targets.

³ Formerly known as the Carbon Disclosure Project, CDP provides the platform for reporting greenhouse gas emissions and climate change data.

*N.B - Nations are currently in the process of preparing their 'Intended Nationally Determined Contributions (INDCs) for COP 21 so these commitments may change.

AUSTRALIAN CONTEXT

Australia is the largest emitter per capita amongst nations in the Organisation of Economic Cooperation and Development (OECD).

FEDERAL POLICY

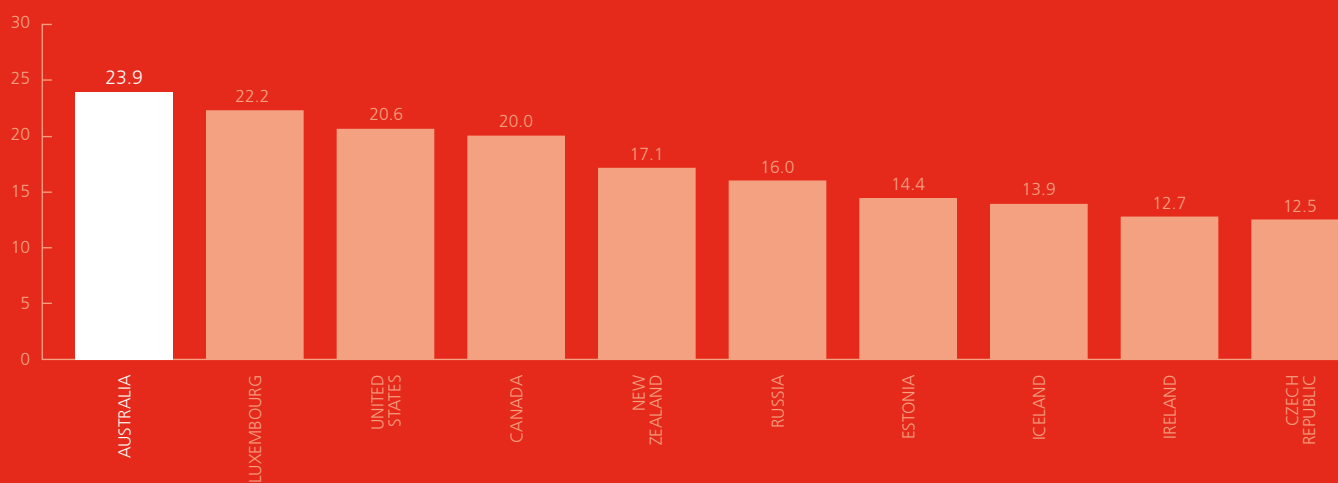
The Australian Government has committed to a 5% reduction of greenhouse gas emissions on 2000 levels by 2020. Two key policies underpin this target: a Direct Action Plan that uses a \$2.55 billion Emissions Reduction Fund (ERF) to cut emissions via a 'reverse auction', awarding contracts to those who bid emissions abatement projects at lowest cost; and a large scale Renewable Energy Target (RET), now a reduced fixed figure of 33,000 GWh by 2020.

The Australian Government also intends to include a Safeguard Mechanism to its Direct Action Plan, commencing operation in 2016. The intent of the Safeguard Mechanism is to prevent emissions reductions purchased by the Australian Government through the ERF from being offset by significant rises in emissions elsewhere in the economy. However, expert analysis has questioned the adequacy of the mechanism on the basis of its ability to support long-term emissions reductions⁴.

Australia's Climate Change Authority (CCA), a statutory independent authority tasked with advising the Federal Government on climate change matters, has recommended a reduction in greenhouse gas emissions to 40-60% below 2000 levels by 2030. It is the CCA's view that this range of targets is consistent with pledges of similar developed nations (Climate Change Authority, 2015). The CCA is also currently undertaking an 18-month enquiry into the establishment of an emissions trading scheme (ETS), including a review of schemes being implemented by Australia's major trading partners.

The Australian Government recently announced it will establish a target to reduce Australia's greenhouse gas emissions by 26-28% from 2005 levels by 2030, and that it will meet the 2030 target through policies built on the Direct Action Plan, in particular the Emissions Reduction Fund and its Safeguard Mechanism. It has also announced that it will develop a National Climate Resilience and Adaptation Strategy.

HIGHEST PER CAPITA GREENHOUSE GAS EMISSIONS BY COUNTRY IN THE OECD 2012



Highest per capita greenhouse gas emissions by country in the OECD expressed as tonnes of carbon dioxide equivalent (CO2e) 2012
Source: OECD (2015)

On the basis of expert analysis, the South Australian Government is not convinced that the Emissions Reduction Fund and Safeguard Mechanism are sufficient to successfully and efficiently underpin Australia's emissions reduction efforts post-2020 without a price on carbon. This is supported by reports demonstrating that, since the repeal of the national Carbon Pricing Mechanism in 2014, greenhouse gas emissions within the National Electricity Market (NEM) have increased by 6.4 Mt CO₂e to June 2015⁵.

The South Australian Government supports an appropriately designed emissions trading scheme (ETS), with a legal cap on emissions. A market-based mechanism such as a carbon price places a monetary value on greenhouse gas emissions. This value sends an economic signal which encourages demand side efficiency and greenhouse gas reduction through capitalising on technology, changing operational practices and driving innovation. Carbon pricing is recognised internationally by organisations such as The World Bank, International Monetary Fund, expert economists and across many Australian businesses, environmental and community groups as the most economically efficient and effective means for greenhouse gas mitigation.

The previous 41,000 GWh Large Renewable Energy Target was created in 2009 out of a bi-partisan agreement between the Commonwealth, States and Territories. The initial intention was for State-based schemes to be rolled into an expanded RET in recognition of the benefits of a nationally harmonised scheme of a sufficient scale. The policy intent of the RET is to reduce the greenhouse emissions intensity of the NEM (total greenhouse gasses per MWh of electricity produced) by mandating the purchase of electricity by retailers from zero carbon renewable energy sources. This provides an economic incentive to invest in the development of new renewable energy generation assets. However, there is a concern that the reduced target of 33,000 GWh by 2020 is no longer sufficient to drive the investment and development required to underpin Australia's long-term greenhouse gas emissions reduction effort.

⁴ Reputex ERF Safeguards August 2015

⁵ Pitt&Sherry CEDEX Electricity Update July 2015





THE SOUTH AUSTRALIAN GOVERNMENT'S LEADERSHIP ROLE

The role of the South Australian Government with regard to climate change includes:

- providing policy certainty
- establishing a consistent and effective regulatory framework
- facilitating action within the community and private sector
- collaborating with other jurisdictions domestically and internationally
- leading by example through measures to reduce its own emissions (including procurement policy, assessing climate risk to its own assets and incorporating climate change considerations into decision making)

With the renewed action being taken at the State and Territory level, current absence of a carbon price and uncertainty in the climate change policy environment at the national level, there is a real need for the State and Territory governments to work together to facilitate a robust, coherent and predictable climate change policy framework for Australia.

This may involve coordinated advocacy to the Australian Government about programs or policies best undertaken at a national level, as well as joint programs between schemes in different jurisdictions.

In May 2015, the Premier hosted a Jurisdictional Meeting on Climate Change attended by representatives⁶ from seven Australian jurisdictions to discuss collaboration on climate change and to receive a briefing from the Executive Secretary of the UNFCCC, Christiana Figueres. In July 2015, the Minister for Climate Change attended a Sub-national Climate Change Conference hosted by the Victorian Government in Melbourne. Through the Council of Australian Governments (COAG), South Australia also participates in a cross-jurisdictional Adaptation Working Group that supports the Meeting of Environment Ministers.

The South Australian Government also has a variety of measures in place designed to reduce its own emissions. This includes increasing the energy efficiency of its own buildings, reducing emissions within the government's fleet and exploring opportunities to increase renewable energy generation. These measures are outlined in more detail in the Reduce consultation paper.

⁶ South Australia, Victoria, Queensland and the Australian Capital Territory were represented at the Ministerial level. The Commonwealth Government, New South Wales, Tasmania and the Australian Local Government Association were represented by Senior Officials.



SOUTH AUSTRALIAN CLIMATE CHANGE LEGISLATION

With the introduction of the *Climate Change and Greenhouse Emissions Reduction Act 2007*, South Australia became the first Australian jurisdiction to enact specific climate change legislation that sets a long-term aspirational emissions reduction target.

The Act also established the Premier's Climate Change Council (PCCC) to provide independent advice to the Minister for Climate Change about matters associated with reducing greenhouse gas emissions and adapting to climate change. Council members are appointed from a range of sectors including business and government, the environment and conservation sector, and the scientific community.

The PCCC also takes a leadership role in consulting with business, the environment and conservation movement and the wider community about issues associated with climate change. It also helps disseminate information to business and other groups to encourage the implementation of practices that will assist in addressing climate change or adapting to its effects.

A legislated review of the Act is required in 2015 and feedback is sought, as part of this consultation process, on whether its aims are being achieved and what additional legislative measures might be considered to help achieve its targets.

The following sets out 11 formal Objects of the Act and recent activities and achievements relevant to each.

1. Assist in the achievement of ecologically sustainable development in the State by addressing issues associated with climate change, particularly through setting a greenhouse gas emissions reduction and renewable energy targets.

The Act sets a target to reduce greenhouse gas emissions in the state by at least 60% of 1990 levels by the end of 2050, as part of a national and international response to climate change. It also sets renewable electricity generation and consumption targets of 20% by 2014. The generation target was subsequently increased to 33% renewable electricity by 2020. These renewable energy targets have now been exceeded.

According to the latest greenhouse accounting data from the Australian Government, South Australia has reduced its net emissions by 9% below 1990 levels. To achieve the emissions reduction target by 2050 as currently legislated, South Australia must reduce its greenhouse gas footprint by an additional 51%. Based on the latest data, this equates to a total emissions reduction of 19.4 Mt of carbon dioxide equivalent (CO₂e), or reaching a level of 12.9 Mt of CO₂e by 2050.

Further information about greenhouse gas emissions reduction in South Australia can be found in the *Reduce* paper.

2. Promote commitment to climate change action through sectoral targets, interim targets and the specific policies and programs for the reduction of greenhouse gas emissions

Individual industries, organisations, regions and sectors have worked with the Government to establish voluntary greenhouse gas emissions reduction targets via Sector Agreements under section 16 of the Act. These agreements have been broad ranging across sectors, capturing industries as diverse as steel manufacturing, cement production, urban development and waste management.

In recent years, many of the Sector Agreements between the State Government and industry have expired and not been renewed. In its formal advice to the Premier, the PCCC recommended the continued use of Sector Agreements to establish targets and climate change action. The Government is now seeking feedback on how the use of Sector Agreements might work into the future.

Given the long-term nature of South Australia's legislated greenhouse gas emissions reduction target, the idea of developing interim targets to drive short-term greenhouse efficiency improvements across the State and to support the long-term target and required policy settings has been raised.

The PCCC has recommended that the Government "negotiate bipartisan agreement for deep cuts in greenhouse emissions by 2050 and interim greenhouse and renewable energy targets for 2025". Community and stakeholder input is sought on the merits of this recommendation. The current target is to reduce greenhouse gas emissions by at least 60% of 1990 levels by 2050. Scientific consensus, including expert advice from the IPCC, advises that limiting global temperature rises to 2 degrees Celsius or less is likely to require a substantial reduction in global energy sector greenhouse gas emissions of as much as 90% or more below 2010 levels between 2040 and 2070⁷.

Consistent with the goal of limiting temperature rises to within 2 degrees, a number of leading sub-national governments, including Quebec, California and the Basque Country, recently committed to the Global Climate Leadership Memorandum of Understanding (Under2MOU) initiative, which requires them to pursue emission reductions of at least 80% below 1990 levels by 2050 and to set a midterm target and pathways to meet that target.

⁷ Intergovernmental Panel on Climate Change, 2014

⁸ Climate Ready SA data developed by the Goyder Institute

⁹ The \$3M University of Adelaide project has received funding from the Australian Renewable Energy Agency, SA Power Networks, the Energy Networks Association, and private companies.

3. Encouraging energy efficiency and conservation

Conserving energy and becoming smarter and more efficient with our electricity use and consumption patterns (e.g. managing 'peak demand' through smart metering or tariff bands) is important as a sizable portion of our grid electricity is produced from fossil fuels. The Government has undertaken a range of initiatives to encourage energy efficiency and conservation in residential, commercial, transport and government sectors, including programs focussed on dwellings such as water heater and air conditioner energy efficiency standards, dwelling design energy efficiency standards, as well as energy efficiency targets with energy retailers and energy advisory services. More information is provided in the *Reduce* paper.

In addition, the Government has introduced a target to improve the energy efficiency of government buildings by 30% by 2020. To date, a 24% overall energy efficiency improvement compared to the baseline year of 2000/01 has been achieved.

4. Research and development

The Government has supported a range of research and development initiatives related to climate change, including the development of downscaled climate change projections for South Australia⁸, research to better understand the use of battery energy storage in Australian conditions⁹, research to identify the institutional, policy or information barriers to climate adaptation¹⁰, investigating the issue of sea level rise in South Australia¹¹, and support for the National Climate Change Adaptation Research Facility. Specific projects are highlighted in the *Adapt*, *Reduce* and *Innovate* papers.

The Government has also supported the Goyder Institute to develop climate projections that align with the state's Natural Resources Management (NRM) regions. These projections, along with integrated vulnerability assessments occurring across the state as part of the adaptation planning processes, are providing locally relevant climate change information to assist in decision-making.

5. Commercialisation of new technology

The Government has undertaken or supported initiatives to encourage the commercialisation of new technology, many of which are explored in further detail in the *Reduce* paper.

¹⁰ Science to Solutions is a partnership between the Local Government Association of South Australia (LGASA) and the State Government

¹¹ Defining the Sea Level Rise Problem in South Australia, jointly funded by State Government, the Coast Protection Board and the LGASA.

The establishment of Renewables SA in 2009 has driven substantial investment in renewable technology development and underpinned the state's greenhouse gas emissions reduction efforts, while the Building Innovation Fund program assisted owners of commercial buildings to retrofit existing buildings and reduce greenhouse gas emissions. In total 11 projects have been funded, including development and installation of a green roof, a green wall, solar panels, "Blue gen" fuel cells, tri-generation and a number of feasibility studies.

Recent support for emerging technologies includes a carbon sequestration demonstration project at the Torrens Island Gas Power Station, and solar battery storage trial for prominent buildings along North Terrace. In addition, funds have been provided to double the Adelaide City Council's Sustainable City Incentives Scheme in 2015/16. This initiative offers incentives to all building owners and tenants including businesses, residents, schools, community and sporting organisations in the City of Adelaide for works such as the installation of solar PV and solar hot water systems, energy storage technologies, electric vehicle charging controllers and energy monitoring systems.

6. Recognising the efforts of bodies or persons that commit to climate change action

The Government has focussed on two key ways to provide recognition to those who commit to addressing climate change. The Sector Agreement program recognises industries and regional leaders, while the Adaptation Framework empowers and recognises local climate change leadership.

7. Encouraging and facilitating business and community consultation and early action

The Government has consulted with businesses and communities on a range of climate change issues through the PCCC and grants programs with non-government organisations and NRM Boards. In the development of its vision, the PCCC consulted across government and industry sectors on the challenges and opportunities arising in transitioning to a low carbon economy.

The Government is partnering with industry through the Tonsley redevelopment to encourage research and development in new technologies that will assist in taking action on climate change. It is also introducing legislation to introduce Building Upgrade Finance (BUF), a voluntary mechanism that helps building owners access finance to improve the energy, water and environmental efficiency of existing commercial buildings.

Implementation of *Prospering in a Changing Climate: A Climate Change Adaptation Framework for South Australia* (the Adaptation Framework) across the state is empowering regional communities and decision makers to identify climate change vulnerabilities, develop adaptation plans and take early climate change action. The Government is also supporting the Conservation Council of SA to raise community awareness and build community capacity in climate change action.

8. Supporting and facilitating adaptation measures

The Adaptation Framework provides a mechanism for regional and metropolitan leaders to work together to plan for the impacts of climate change. Planning for all regions has now commenced and five of 12 regional adaptation plans have been released.

The development of the new Climate Change Strategy will build on the significant body of work undertaken through the regional adaptation planning processes. The review of the Act will also consider whether the focus on adaptation should be strengthened in the legislation. Further information is included in the *Adapt* discussion paper.

9. Reporting on progress against the objects of the Act

The Act requires the Minister for Climate Change to report every two years on its operation and to make a full review every four years. As highlighted previously, input received as part of this consultation process will inform the report of the 2015 review.

10. Promoting consistency with national and international policy

The State Government is working with other Australian and international jurisdictions to promote collaboration and consistency in climate change actions. Specific details on the consistency of South Australian initiatives have been highlighted previously.

11. Contributing and responding expeditiously to national and international policy developments

The establishment of a Ministerial portfolio for Climate Change has equipped the State to participate in national and international policy developments. Refer to material earlier in this paper in relation to the international and national context.

THE ROLE OF OTHER SECTORS

COMMUNITY

Individuals and communities will primarily be responsible for managing climate risk, in particular to private assets, incomes and health and wellbeing. The benefits from doing so are a strong incentive to act. In addition, members of the community, through their lifestyle choices, can also make a difference to South Australia's climate change effort such as being more energy efficient and walking, cycling and using public transport more often. These measures are outlined in more detail in the *Reduce* consultation paper.

Not-for-profit and community organisations have important roles in drawing attention to savings that can be achieved to households through adoption of energy efficiency and other measures that also enhance the resilience of households and communities.

Governments also play a key role in not only promoting climate change action, but by providing a social safety net to assist those who may otherwise have difficulty in adapting to the impacts of climate change, particularly vulnerable groups, such as the aged, young, poor and Indigenous communities.

The PCCC has recommended that the South Australian Government prioritise support for the most vulnerable in the community and partner with the community services sector to build its capacity to respond to impacts of climate change.

It is recognised, in particular, that Aboriginal, local or traditional knowledge systems and practices, including Indigenous peoples' holistic view of community and environment, are a major resource in planning for climate change adaptation, and that integrating traditional knowledge into practice is likely to increase the effectiveness of adaptation (Intergovernmental Panel on Climate Change, 2014).

PRIVATE SECTOR

From a climate change adaptation perspective, industry and business are primarily responsible for managing risks to their respective assets and incomes associated with climate risk. The financial services industry, particularly insurers, have already begun accounting for future climate risks within their business practices, however more work is needed particularly to develop evolving financial mechanisms to help manage risks and maintain resilience. The private sector has a particular interest in maintaining the vibrancy and longevity, particularly within regional economies and therefore must play an important role in building climate resilience in regional communities.

Achieving the stabilisation of greenhouse gases in the atmosphere cannot be achieved without cooperation and partnership of the private sector. Acting to reduce emissions in many cases is sound business practice as it helps reduce costs, build brand reputation and boost growth and productivity. More broadly, a vibrant private sector responsive to the emerging low-carbon economy will assist in boosting jobs and growth opportunities for South Australia and its future.

The South Australian Government recognises that a sizable portion of the innovation required to transition to a low carbon, resilient economy must be led by the ingenuity and creativity of the private sector. However, the right regulatory and policy settings from Government are crucial in catalysing investment and development decisions. These concepts are explored in more detail in the *Adapt*, *Reduce* and *Innovate* consultation papers.

RESEARCH SECTOR

Research Institutions including the Commonwealth Scientific and Industrial Research Organisation (CSIRO), South Australian Research and Development Institute (SARDI), the National Climate Change Adaptation Research Facility (NCCARF), the Goyder Institute for Water Research and South Australia's universities have a clear role in the science and research that will underpin successful emissions reduction, innovation and adaptation responses. However, there is a need to further harness this intellectual capital in order to establish effective partnerships between research institutions and the private sector in order to commercialise research and facilitate ongoing innovation. This concept is explored further in the *Adapt* and *Innovate* papers.

REFERENCES

Climate Change Authority. (2015). Australian Government Climate Change Authority. Retrieved from Final report on Australia's future emissions reduction targets: <http://www.climatechangeauthority.gov.au/node/355>

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.

Organisation for Economic Co-operation and Development. (2015, March). OECD. StatExtracts. Retrieved from Greenhouse Gas Emissions: <http://stats.oecd.org/Index.aspx>

Pitt and Sherry. (2015). Cedex Electricity emissions update - data to 30 June 2015. Retrieved from: <http://www.pittsh.com.au/assets/files/Cedex/CEDEX%20Electricity%20Update%20July%202015.pdf>

Reputex. (2015). ERF Safeguards. Retrieved from: <http://www.reputex.com/publications/market-update/update-reviewing-the-safeguard-market-toothless-tigeror-hidden-dragon/>

The Climate Group. (2015). The Climate Group. Retrieved from Compact of States and Regions: <http://www.theclimategroup.org/what-we-do/programs/compact-of-states-and-regions/>

The Climate Group. (2015). The Climate Group. Retrieved from States and Regions Alliance: <http://www.theclimategroup.org/what-we-do/programs/states-and-regions/>

The World Bank. (2015). CO2 emissions (kt). Retrieved from Data: <http://data.worldbank.org/indicator/EN.ATM.CO2E.KT/countries>



GLOSSARY & ACRONYMS

BATTERY STORAGE

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

BUILDING UPGRADE FINANCE (BUF)

Building Upgrade Finance is a mechanism which helps building owners to access loans to improve the energy, water and environmental efficiency of existing commercial buildings. The loan is tied to a property rather than a property owner and loan repayments are collected via a local government charge that is levied on the property and passed on to the financier.

CARBON DIOXIDE EQUIVALENT (CO₂e)

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 CO₂e.

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 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.

CLIMATE CHANGE PROJECTIONS

A forecast of expected climate changes into the future based on scientific modelling and greenhouse gas emissions scenarios.

CLIMATE CHANGE SECTOR AGREEMENT (CCSA)

Sector agreements are formal cooperative agreements between the state government and specific business entities, industry sectors, community groups and regions to help tackle climate change.

The agreements typically include commitments and actions to adapt to climate change, reduce greenhouse gas emissions and support research and development.

CLIMATE RISK

A risk resulting from climate change affecting natural and human systems and regions.

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.

COMPACT OF STATES AND REGIONS

The Compact of States and Regions provides the first ever single, global account of greenhouse gas (GHG) reduction targets made by state and regional governments.

COUNCIL OF AUSTRALIAN GOVERNMENTS (COAG)

The Council of Australian Governments is an organisation consisting of the federal government, the governments of the six states and two mainland territories and the Australian Local Government Association.

EMISSIONS REDUCTION FUND (ERF)

The Emissions Reduction Fund is an initiative of the Australian Government's Direct Action Plan on climate change. The fund is purposed to purchase lowest cost emissions abatement from various sectors across the economy.

EMISSIONS REDUCTION TARGET

A measurable target to reduce the amount of greenhouse gas emissions released.

ENERGY EFFICIENCY

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

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 gasses are based on.

GREENHOUSE GAS MITIGATION

Processes and methods to reduce the release of greenhouse gas emissions.

GROSS DOMESTIC PRODUCT (GDP)

The total value of goods produced and services provided in a country during one year.

INTEGRATED VULNERABILITY ASSESSMENTS (IVAS)

A method used for climate change adaptation planning to identify risks associated with climate change and actions that can manage those risks.

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).

INTENDED NATIONALLY DETERMINED CONTRIBUTIONS (INDC)

A National submission to publicly outline what post-2020 climate actions countries intend to take under a new universal agreement for climate change, in the lead up to the Conference of Parties (COP) in Paris, 2015.

LOW CARBON ECONOMY

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

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.

NATIONAL CLIMATE CHANGE ADAPTATION RESEARCH FACILITY (NCCARF)

NCCARF works to support decision makers throughout Australia as they prepare for and manage the risks of climate change and sea-level rise. It has a national focus to build resilience to climate change in government, NGOs and the private sector.

NATIONAL ELECTRICITY MARKET (NEM)

The largest electricity grid market in Australia. The NEM interconnects five regional market jurisdictions (Queensland, New South Wales, Victoria, South Australia and Tasmania).

The NEM involves both wholesale generation of electricity that is transported via high voltage transmission lines to electricity distributors, who deliver it to our homes and businesses.

NATIONAL GREENHOUSE GAS INVENTORY (NGGI)

Australia's national greenhouse gas inventory, a publication that fulfils Australia's international and domestic reporting requirements, administered by the Federal Government Department of the Environment.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD)

The mission of the Organisation for Economic Co-operation and Development (OECD) is to promote policies that will improve the economic and social well-being of people around the world.

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.

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.

RENEWABLES SA

RenewablesSA is an initiative of the South Australian Government to support the further growth of South Australia's renewable energy industry.

SOUTH AUSTRALIAN RESEARCH AND DEVELOPMENT INSTITUTE (SARDI)

The South Australian Research and Development Institute is the State Government's principal research institute.

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.

THE CLIMATE GROUP STATES AND REGIONS ALLIANCE

The Climate Group States & Regions Alliance brings together sub-national government leaders from around the world in a powerful, high-profile network that shares expertise, demonstrates impact and influences the international climate dialogue.

UNDER2MOU

The Subnational Global Climate Leadership Memorandum of Understanding is known as the Under 2 MOU in reference to:

- The goal of limiting warming to below 2°C, which Intergovernmental Panel on Climate Change (IPCC) scientists say is needed to avoid dangerous climate change.
- The MOU's shared goal of limiting greenhouse gas emissions to 2 tonnes per capita, or 80-95% below 1990 level by 2050.

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.



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