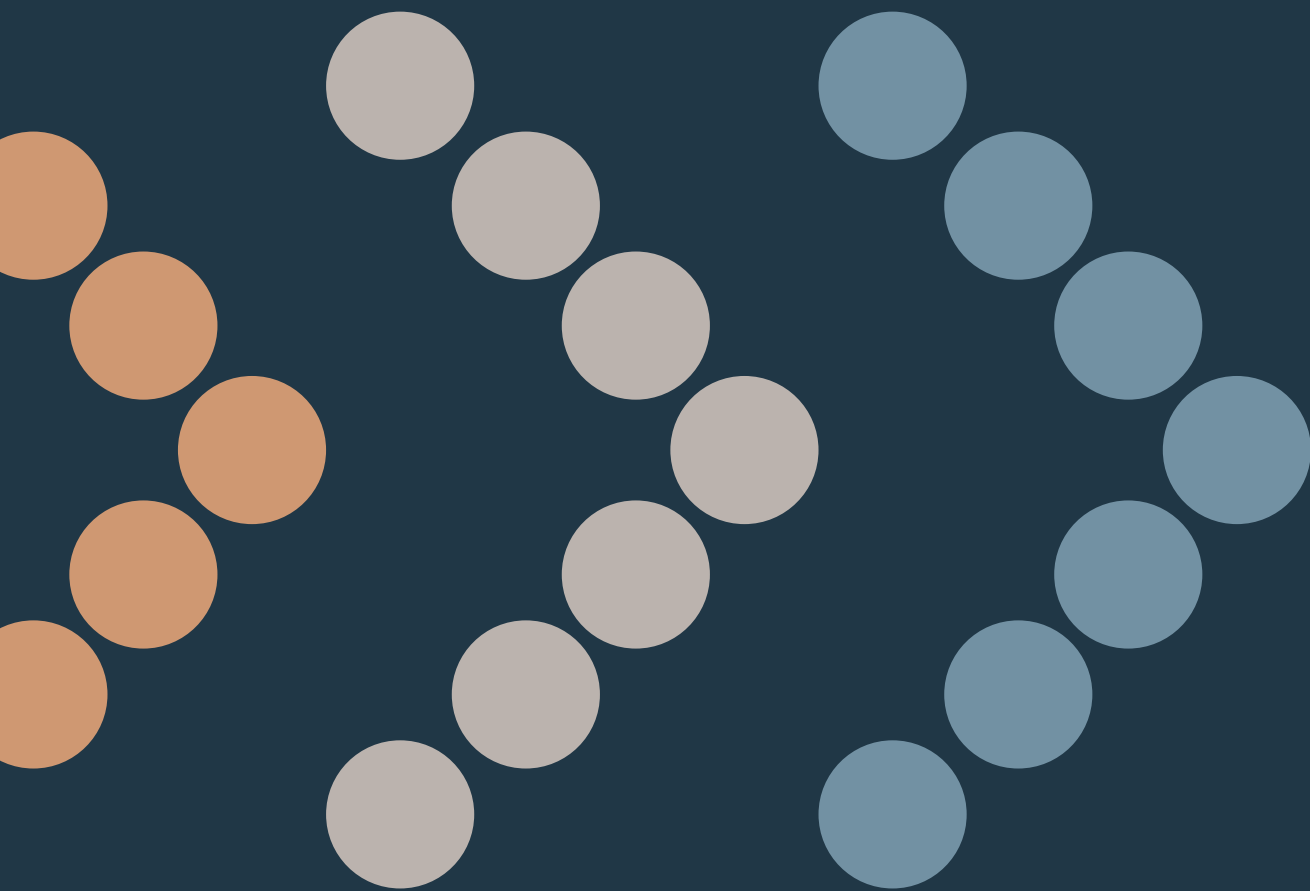


CLIMATE ACTION 21

Tasmania's Climate Change Action Plan 2017–2021





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Climate Action 21: Tasmania's Climate Change Action Plan 2017–2021

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Tasmanian Climate Change Office
Department of Premier and Cabinet

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MINISTER'S FOREWORD



In June 2019 I was proud to become the Minister for the Environment, Parks and Heritage.

The Tasmanian Government recognises that climate change is a serious issue and is committed to taking practical action. *Climate Action 21: Tasmania's Climate Change Action Plan 2017-2021* (Climate Action 21) sets the Tasmanian Government's agenda for action on climate change.

Tasmania holds a unique position in Australia. We have the lowest per capita greenhouse gas emissions in the country, and our latest greenhouse gas emissions inventory shows that for the sixth year in a row we have met our legislated emissions reduction target. The State's greenhouse gas emissions have declined by 95 per cent from 1990 levels. Tasmania can capitalise on this achievement as we work towards our commitment to zero net emissions.

Tasmania is also among the leaders globally, with the State's emissions at 1.7 tonnes of CO₂-e per person being well below the global average of nearly 5 tonnes.

Under Climate Action 21, the Government has committed \$3.25 million towards taking practical action to reduce emissions across a range of sectors, and strengthen our transition to a lower carbon economy. A significant amount of work has already been delivered since the release of Climate Action 21 in 2017.

In that time, we have committed over \$600,000 towards a statewide electric vehicle charging network; supported the integration of electric vehicles into fleets; helped businesses improve their resource efficiency and reduce waste; delivered a Climate Change Health Roundtable and a Climate Change Symposium; assisted businesses to analyse their energy use and find ways to reduce it; delivered the first phase of the Climate Resilient Councils project; and funded research into compound extreme weather events.

In addition to these achievements, the Tasmanian Government is committed to making Tasmania energy self-sufficient with an additional 1,000 gigawatt hours of on-island renewable energy generation by the end of 2022.

The Tasmanian Government recognises the importance of implementing Climate Action 21 to reduce the State's emissions and prepare for both the opportunities and risks presented by a changing climate.

A handwritten signature in black ink, appearing to read 'Peter Gutwein', with a long horizontal line extending to the right.

PETER GUTWEIN MP
Minister for the Environment,
Parks and Heritage



OUR PRIORITIES

Climate Action 21 has been developed with input from the Tasmanian community, businesses, local government and the scientific community. It has been developed in consideration of the 21st Conference of the Parties of the United Nations Framework Convention on Climate Change Paris Agreement (Paris Agreement) to limit global warming to below 2°C and the Australian Government's commitment to reduce emissions to between 26 and 28 per cent below 2005 levels by 2030.

We are focused on delivering practical action in areas where we can realise the greatest benefits, manage risks in a measured way and play our role in meeting this global challenge.

Climate Action 21 is structured into six priorities. Each priority area includes a 2021 vision statement, our actions for 2017 to 2021 and details of initiatives already being progressed by the Tasmanian Government.

Climate Action 21 has 37 actions based around the priority areas.

Figure 1 provides an overview of Climate Action 21.



1

UNDERSTANDING TASMANIA'S FUTURE CLIMATE

commits to providing up-to-date information on climate change projections and impacts, and tailoring this information to support decision making across key industry sectors.



2

ADVANCING OUR RENEWABLE ENERGY CAPABILITY

supports national energy security solutions in the transition to a low carbon generation network and delivers energy efficiency programs with local government, households and businesses.



3

REDUCING OUR TRANSPORT EMISSIONS

promotes the uptake of electric vehicles and other alternative forms of transport, and optimises the use of vehicles to reduce costs and emissions.



4

GROWING A CLIMATE-READY ECONOMY

supports businesses and agricultural producers to reduce their emissions, be prepared for the impacts of climate change, and leverage opportunities.



5

BUILDING CLIMATE RESILIENCE

enhances our capacity to withstand and recover from extreme weather events, and better understand and manage the risks of a changing climate.

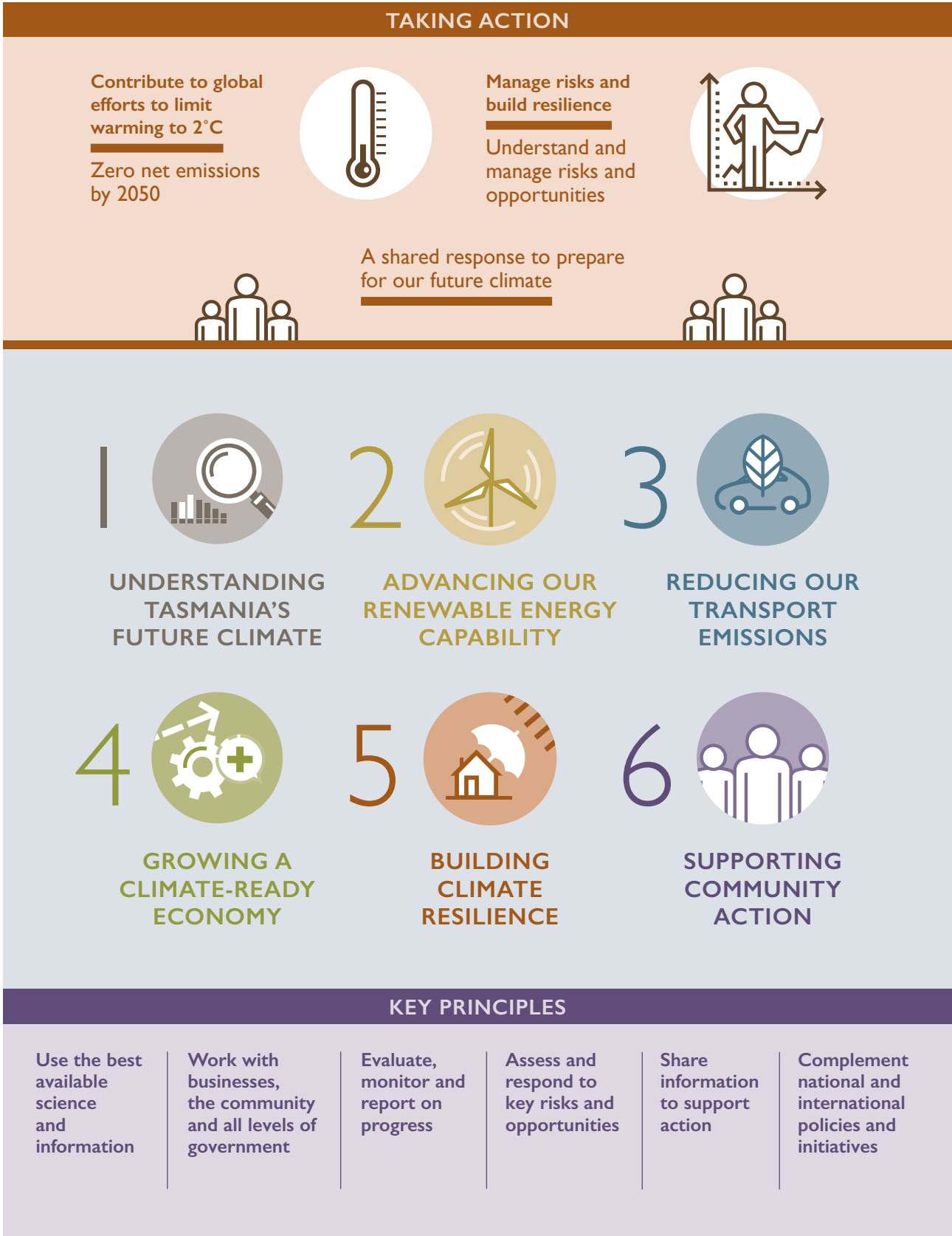


6

SUPPORTING COMMUNITY ACTION

establishes an aspirational emissions reduction target of zero net emissions by 2050, recognises that all Tasmanians have a role to play in tackling climate change, and assists the community to reduce emissions and energy use.

FIGURE 1
CLIMATE ACTION 21
OVERVIEW





UNDERSTANDING TASMANIA'S FUTURE CLIMATE



By 2021 we will be:

- **Ensuring we have the best available evidence about our future climate; and**
- **Using tailored and accessible information to support decision making based on our future climate.**

Tasmania is fortunate to have a world class capability in Antarctic, Southern Ocean and climate science, led by organisations such as the Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC), Commonwealth Scientific and Industrial Research Organisation (CSIRO), and the Institute for Marine and Antarctic Studies (IMAS).

Since 2010, Tasmania has benefited from downscaled climate change projections developed by the Climate Futures for Tasmania project. This project was undertaken by ACE CRC with funding from the Tasmanian Government and other parties.¹

This work projected the impact of changes to Tasmania's climate from 1961 to 2100 and provided information about these impacts in areas such as agriculture, water catchments, extreme events and future fire danger. The Climate Futures for Tasmania project has provided the foundation for Tasmania's adaptation planning.

Developments in climate science continue to allow for more research areas to be explored. It is important that our evidence base take account of these developments. New climate models are being released as part of the forthcoming Intergovernmental Panel on Climate Change's Sixth Assessment Report. We need to consider the implications of these models for Tasmania to ensure we make informed decisions for our future in areas such as agricultural production, land use planning, infrastructure investment and emergency management.

The Tasmanian Government will continue to work in partnership with communities, businesses and organisations to understand and address their needs in relation to climate projections. By working in partnership with our Antarctic and climate science community, we can continue to build our understanding of future climate impacts. The Tasmanian Government strongly advocated for the Hobart-based CSIRO National Climate Science Centre, and will continue to advocate for a commitment to climate science in Australia.

The actions for this priority area focus on:

- Working with ACE CRC, CSIRO, IMAS and other partners in government and industry to ensure the best available scientific data continues to be available;
- Delivering research to improve our understanding of the likelihood and impact of multi-hazard coincident extreme events in Tasmania, as experienced in January 2016 when bushfires in the Tasmanian Wilderness World Heritage Area (TWWHA) occurred at the same time as severe flooding on the East Coast;
- Providing tailored information based on current climate change projections to support decision making across all sectors; and
- Continuing to promote and support the National Climate Science Centre in Hobart.

1. For further information on the Climate Futures for Tasmania project see <http://acecrc.org.au/climate-futures-for-tasmania>.

What we have done so far:

Sponsored research to consider the impacts of a changing climate on emergency service volunteer resources in Tasmania

Improved our understanding of Tasmania's future fire danger in a changing climate by supporting ACE CRC to undertake research examining the State's future fire danger and the viability of planned burning in a changing climate

Advocated for the establishment of the National Climate Science Centre in Hobart

Action		Milestones	Lead Agency Partner Agency
1.1	Undertake research on climate change projections with key industry partners	<ul style="list-style-type: none"> – Undertake a review of climate change modelling and identify research gaps and opportunities – Work with the scientific community, industry and governments to determine priority research projects 	DPAC (TCCO) ²
1.2	Build our understanding of Tasmania's vulnerability to coincident extreme events and their impacts	<ul style="list-style-type: none"> – Undertake research to understand the complex interdependent relationships between natural hazards and their causes 	DPAC (TCCO)
1.3	Provide sector-specific information on Tasmania's future climate	<ul style="list-style-type: none"> – Deliver tailored climate information and decision support tools for end users such as the wine industry, catchment managers and emergency services 	DPAC (TCCO)
1.4	Support an ongoing commitment to the National Climate Science Centre in Hobart	<ul style="list-style-type: none"> – Support the ongoing activities of the National Climate Science Centre 	DPAC (TCCO)

2. A list of acronyms and abbreviations is on page 31.





ADVANCING OUR RENEWABLE ENERGY CAPABILITY



By 2021 we will be:

- **Maximising the generation of renewable energy in meeting the State’s electricity needs and supporting national electricity security and affordability; and**
- **Using energy more efficiently to reduce emissions and electricity costs for households and businesses.**

Tasmania has an enviable renewable energy profile. Approximately 90 per cent of our electricity generation is from renewable resources, putting us in a unique position to pursue national opportunities. Approximately 10 per cent of our renewable energy comes from wind, and the remainder from hydro-electric generation, which delivers base load and peaking electricity for Tasmania’s major industrials, small businesses and households.

Our current energy profile is built on over 100 years of investment in hydro-electric generation. This system has supported the Tasmanian community and economy, and has positioned Tasmania well for the transition to a low-emissions economy. The Tasmanian Government is focused on generating electricity as efficiently as possible. In the past two years, Hydro Tasmania has spent close to \$150 million and is planning to spend \$400 million in the next four years to upgrade and modernise its ageing generation assets.

Tasmania has the opportunity to become a net exporter of electricity, which would support improved energy security and reliability, not only in Tasmania but also across the National Electricity Market (NEM). Tasmania’s flexible hydro-electric generation may assist in balancing the intermittent nature of other renewable energy sources across the NEM.

The Interim Report released by the Tasmanian Energy Security Taskforce identifies a deficit of up to

1,000 gigawatt hours of average annual electricity generation for Tasmania to become a net exporter of electricity over the long term. Increasing the energy efficiency of our homes and businesses may reduce the draw-downs from Tasmania’s hydro storages, further enhancing the potential for renewable energy generation to meet the State’s electricity needs and improving our energy security.

The Council of Australian Governments (COAG) Energy Council has agreed to an independent review of national energy security and the reliability of the NEM, with advice on a coordinated, national reform blueprint.

The Australian Renewable Energy Agency (ARENA) will work with Hydro Tasmania on feasibility studies to assess a number of new pumped hydro-energy schemes that could deliver up to 2,500 megawatts of additional capacity for the NEM and augmentation of the existing hydro system with the redevelopment of the Tarraleah Scheme and efficiency improvements at Gordon Power Station. This will enhance Tasmania’s hydro-electric and renewable energy supply for the benefit of the national market transition to a lower carbon emission future. The ARENA work will build on the joint study on the second interconnector by Dr John Tamblyn. This report found that a second interconnector has the potential to deliver significant benefits, but its full potential will depend on the ongoing development of the electricity system in both Tasmania and the NEM.

What we have done so far:

Established the **Tasmanian Energy Security Taskforce** to undertake an independent energy security risk assessment for Tasmania, including the potential impact of climate change on energy security and supply

Released the **Tasmanian Energy Strategy** to maximise Tasmania’s renewable energy opportunities and support energy efficiency initiatives

Conducted studies to identify the necessary pre-conditions for establishing the **viability of a second Bass Strait interconnector** and for **increasing hydro-electricity generation by 10 per cent**

Delivered an **aged care energy efficiency project** involving energy efficiency audits for 11 residential aged care facilities to identify opportunities to improve energy efficiency

Extended the **No Interest Loan Scheme** to assist low income Tasmanians to purchase energy efficient products

Continued **Aurora Energy’s Your Energy Support program** to provide assistance to low income residential customers having difficulty paying their electricity bills through energy saving advice and flexible payment plans

Introduced the \$10 million **Tasmanian Energy Efficiency Loan Scheme (TEELS)** to promote the uptake by consumers of energy efficient products

Tasmania will invest around \$1 billion in maintaining and refurbishing the State's existing hydro-power assets over the next 10 years. With the continued promotion of further renewable energy opportunities, Tasmania is well placed to become the renewable energy battery for Australia.

Maximising our renewable energy contribution to Australia's electricity market represents an opportunity for new investment in Tasmania. The Tasmanian Government supports engagement between renewable energy developers and energy utilities that reduces barriers for new renewable energy projects.

Reducing energy consumption through cost-effective energy efficiency actions will reduce electricity bills for businesses, government agencies and households, and will also improve the management of Tasmania's electricity supply network.

The Tasmanian Government has established the \$10 million Tasmanian Energy Efficiency Loan Scheme (TEELS) that provides no-interest finance to households and small businesses to install energy efficient equipment and appliances.

The actions for this priority area focus on:

- Continuing to invest in existing hydro-electricity assets to ensure the maximum potential renewable energy is generated to assist in lowering emissions;
- Assessing opportunities for increasing Tasmania's renewable energy resources and progressing viable commercial opportunities;
- Assisting small businesses and households to reduce their energy use and save money on electricity bills by overcoming barriers such as up-front capital costs;
- Undertaking a feasibility study into energy efficiency financing options such as Environmental Upgrade Agreements (EUA's);
- Supporting the improvement of street lighting energy efficiency by helping to overcome barriers related to metering and ownership of lighting infrastructure and hardware; and
- Improving the energy efficiency of Tasmanian Government owned and leased facilities by monitoring energy usage, capacity building, conducting energy audits and capital upgrades.





Action		Milestones	Lead Agency Partner Agency
2.1	Promote Tasmanian and National emissions reduction and energy security through a coordinated approach to renewable energy advancement in the State	<ul style="list-style-type: none"> – Continue to invest in existing hydro-electricity assets to maximise potential renewable energy generation – Consider the findings of the Tasmanian Energy Security Taskforce and the feasibility study into a second Bass Strait interconnector – Progress opportunities for further renewable energy development to support our aim to be a net exporter of electricity – Advocate for Tasmania to play a significant role in national energy security through the COAG review into the reliability and security of the NEM in the transition to a low carbon emissions future 	State Growth
2.2	Support the delivery of TEELS	<ul style="list-style-type: none"> – Provide resources and guidance materials to support businesses and households to access TEELS 	DPAC (TCCO)
2.3	Work with businesses to maximise energy efficiency	<ul style="list-style-type: none"> – Provide assistance to businesses to improve energy efficiency – Identify energy saving projects eligible for application to TEELS or other finance options 	DPAC (TCCO)
2.4	Determine the suitability of EUA's to finance energy upgrades in building stock	<ul style="list-style-type: none"> – Deliver a feasibility study into the applicability of EUA's and other financing options in Tasmania 	DPAC (TCCO)
2.5	Support and assist the delivery of energy efficient street lighting projects	<ul style="list-style-type: none"> – Work with local councils and service providers to increase uptake of energy efficient lighting technologies 	DPAC (TCCO)
2.6	Support Tasmanian Government agencies to address energy usage and greenhouse gas emissions	<ul style="list-style-type: none"> – Assist Tasmanian Government agencies with monitoring and reporting 	DPAC (TCCO)
2.7	Improve the energy efficiency of Tasmanian Government owned and leased buildings through energy audits and capital upgrades	<ul style="list-style-type: none"> – Undertake cost-effective capital upgrades to achieve greater energy efficiency – Deliver an energy efficiency behaviour change program 	DPAC (TCCO)



REDUCING OUR TRANSPORT EMISSIONS



By 2021 we will be:

- Reducing our fuel costs and transport emissions through improved fleet efficiency and increasing the uptake of public transport; and
- Supporting the uptake of electric vehicles in Tasmania.

Transport emissions have been declining in recent years, mainly due to improvements in vehicle fuel efficiency. However, in 2015 Tasmania’s transport sector had the highest emissions out of all the reported sectors of our economy, highlighting a need to put in place a range of strategies to support a more sustainable transport system.³

Emerging technologies, such as electric vehicles, are likely to transform transport systems in coming decades. Supporting the uptake of electric vehicles through a planned and coordinated approach, which is informed and driven by the market, will position Tasmania to maximise the potential benefits.

These benefits may be far-reaching for Tasmania. Electric vehicles are less expensive to run than petrol or diesel vehicles, and together with increased renewable electricity supply, will reduce the emissions from our transport sector and help to improve our energy security.

In January 2016, Metro Tasmania introduced a new Hobart bus network, with more frequent and direct services, and better connections at interchanges. By making it faster, smarter and easier to catch a bus, it is intended that more people will choose to leave their car at home, reducing congestion and improving travel time for all road users. The next stage of this work is to review the Metro bus networks in Launceston and Burnie.

Other opportunities to reduce emissions and save on vehicle running costs include considering fuel efficiency and engine size when purchasing a new or used vehicle. We can also address transport emissions by encouraging Tasmanians to use alternative modes of transport such as walking and cycling, especially for short trips.

The actions for this priority area focus on:

- Working in partnership with TasNetworks, local government and the private sector to support the rollout of electric vehicle charging infrastructure;
- Investigating options to address market barriers that are currently hindering greater uptake of electric vehicles, and support the adoption of new transport modes; and
- Supporting Tasmanians to make lower carbon travel choices.

3. Australian Department of Environment, 2017, *State and Territory Greenhouse Gas Inventories 2015*.

What we have done so far:

Delivered the **Electric Vehicle Demonstration Project** in partnership with Hydro Tasmania and TasNetworks

Rolled out the **Smarter Fleets** program to improve light vehicle fleet efficiency with a number of councils, TasNetworks, TasPorts and TasTAFE

Initiated significant **planning reforms**, including infrastructure and planning policies to facilitate and promote active transport

Released for public consultation a draft **transport access strategy**, which sets out the Tasmanian Government’s approach to providing integrated and coordinated transport services, including more opportunities for people to walk, cycle and use public transport

Metro Tasmania has introduced a new **Turn Up and Go** service between Hobart, Rosny Park and Howrah, along with new direct routes to the Sandy Bay University of Tasmania campus from Glenorchy and the Eastern Shore

Action		Milestones	Lead Agency Partner Agency
3.1	Support the rollout of a statewide electric vehicle charging network consistent with market trends	<ul style="list-style-type: none"> – Undertake a report that assesses approaches to the rollout of a charging network and is informed by a market analysis – Work with local government, businesses and industry to improve charging network infrastructure in Tasmania 	DPAC (TCCO)
3.2	Establish an electric vehicle working group to develop a coordinated approach	<ul style="list-style-type: none"> – Identify barriers to electric vehicle uptake – Review relevant policy and regulatory settings – Analyse the impact of electric vehicle uptake on Tasmania's electricity sector – Investigate ways to improve electric vehicle data collection 	DPAC (TCCO)
3.3	Extend the Smarter Fleets program to improve the efficiency of heavy vehicle fleets and additional light vehicle fleets	<ul style="list-style-type: none"> – Conduct training and workshops, and provide tailored support – Develop tools and resources to support broader adoption of identified strategies – Monitor the impact on fleet performance 	DPAC (TCCO)
3.4	Support public transport uptake	<ul style="list-style-type: none"> – Continue to improve the overall journey times for passengers with more frequent and direct services – Pursue opportunities such as the availability of real-time data and prioritisation of buses – Use State Planning Policies to guide the location of development to ensure effective use of the transport network 	State Growth
3.5	Improve the efficiency of the Tasmanian Government transport fleet	<ul style="list-style-type: none"> – Implement strategies identified through the Smarter Fleets program in the Tasmanian Government light vehicle fleet – Review the Green Vehicle Guide minimum standards for the Tasmanian Government fleet – Identify and address barriers to the uptake of electric vehicles in the Tasmanian Government fleet 	DPAC (TCCO)

GROWING A CLIMATE-READY ECONOMY



By 2021 we will be:

- **Working with businesses to reduce emissions intensity and adopt innovative practices; and**
- **Supporting businesses to manage climate risks and take advantage of opportunities.**

The Australian Government has committed to limiting the nation's 2030 emissions to between 26 and 28 per cent below 2005 levels. To achieve this target will require concerted effort across all sectors of Australia's economy.

Tasmania's greenhouse gas emissions have not changed significantly since 1990, with the exception of the forestry industry. During this time, our economy and population have grown substantially, which demonstrates a decoupling of the historic link between economic activity and emissions growth. The Tasmanian Government supports actions which will continue this trend, without placing additional burdens on the community.

Due to Tasmania's significant renewable energy resources, we are well placed to capitalise on our low emissions status. Key growth sectors of the Tasmanian economy, such as agriculture and marine resources, have the potential to benefit from changing market preferences through improved access to export markets and increased investment as a result of our low emissions status.

Some key growth sectors of the Tasmanian economy are vulnerable to the projected impacts of a changing climate. Using the Climate Futures for Tasmania analysis, we can provide tailored information to support the agriculture and business sectors minimise their climate risks and make informed decisions.

Tasmania's temperate maritime climate provides a comparative economic advantage in a changing

climate, particularly in industries such as viticulture, aquaculture and dairy farming. Making informed decisions based on our climate science and capitalising early on opportunities will position Tasmania to maximise economic advantages and allow us to support other states and territories that will experience more adverse impacts in a changing climate. Continuing to invest in skills to support workforce development, tailored to the needs of industry sectors and regional communities, will also help us maximise economic advantages and to prepare for a changing climate.

In partnership with the Australian Government, we are investing in excess of \$100 million in irrigation infrastructure to progress the delivery of an additional 27,700 megalitres (ML) of reliable water to targeted communities. These projects will be delivered as early as the 2017-18 season, with the last due to come online in time for the 2019-20 season. This builds on the 14 irrigation schemes operated or overseen by Tasmanian Irrigation which deliver over 130,000 ML of irrigation water.

Tasmania's well-established forestry industry, together with agricultural production, has an opportunity to use residue materials for biomass, including biofuel and bioenergy, which can reduce emissions from the State's transport and energy sectors. Bioenergy is a mature energy generation technology in Europe and its development in Tasmania provides an opportunity for jobs growth in regional areas as well as reducing the use of fossil fuels.

In addition, the use of locally-sourced wood products can replace the use of more carbon intensive building materials such as concrete and steel to further reduce Tasmania's emissions. The Tasmanian Government is developing a policy to encourage locally-sourced timber to be used in more Government projects as a result of recent changes to the National Construction Code.

The actions for this priority area focus on:

- Using Tasmania's low emissions status to attract investment in key growth sectors;
- Developing irrigation schemes to promote greater water surety across Tasmania to underpin agricultural productivity in a changing climate;
- Working with agricultural producers to improve energy efficiency, reduce the greenhouse gas emissions from fertiliser usage and other farming practices, and adapt to a changing climate;
- Supporting investment in skills to prepare for a changing climate;
- Assisting small- and medium-sized businesses to improve resource efficiency, reduce waste and operating costs, and minimise the risks from a changing climate; and
- Developing a coordinated approach to reduce greenhouse gas emissions from the waste management sector.

What we have done so far:

Supported the **Fert\$mart** program, in partnership with DairyTas, to assist farmers to improve the efficiency of fertiliser use to reduce emissions and costs

Continued to support research and development to encourage environmentally sustainable growth in the agricultural sector through **a partnership agreement with the Tasmanian Institute of Agriculture**

Delivered the **Disaster Planning and Recovery for Tasmanian Businesses** project, including resources and workshops to assist businesses to prepare for and respond to extreme events

Integrated climate change projections into enterprise suitability mapping for poppies, wheat, potatoes, wine grapes and barley to inform future investment decisions for Tasmania's agricultural industries

Adopted an **adaptive management approach to managing our marine resources** through Fisheries Management Plans and Marine Farming Development Plans that take climate change impacts into account

Rolled out the \$1.5 million **Water for Profit Program** to ensure farmers are equipped with the right skills and information to increase profits and sustainability from their investment in irrigation

Invested \$2.8 million in nationally accredited **training courses and skills development** that include consideration of environmental sustainability and climate change

Established the \$1.25 million **Wood and Fibre Processing Innovation Program** to support projects that use forest harvesting and timber processing residues and/or agricultural plant residues to create value-added products in Tasmania

Established the **Agribusiness Support Program** to help farmers reduce their energy costs

Commenced a three-year project to **improve the productivity of Tasmanian vineyards** through management measures to address yield, variability and quality variation

Continued to implement a **biosecurity risk assessment** system and commenced work on a new **contemporary biosecurity legislative framework** to respond to future biosecurity risks from a changing climate

Implemented a new **Ministerial Policy on Water Resource Management During Extreme Dry Conditions**, which updated our water management framework to balance the water needs for communities, stock and irrigators during extremely dry conditions

Supported the production of a second edition of the **Making cent\$ of carbon and emissions on-farm** booklet to support agricultural producers to identify practical actions to improve their emissions performance and productivity

Established the **Pathways to Profit** program to address climate risk management

Action		Milestones	Lead Agency Partner Agency
4.1	Attract investment and jobs using our clean energy advantage	<ul style="list-style-type: none"> – Make climate change projections easily available and accessible for investors 	Coordinator General DPAC (TCCO)
4.2	Work with farmers to reduce fertiliser-related emissions and costs	<ul style="list-style-type: none"> – Deliver the Fert\$mart program in partnership with DairyTas 	DPAC (TCCO)
4.3	Undertake a business resource efficiency program to assist small- and medium-sized businesses to reduce their emissions and costs	<ul style="list-style-type: none"> – Conduct resource efficiency assessments – Prepare resource materials – Identify and rollout resource efficiency strategies, and build skills and capacity 	DPAC (TCCO) State Growth
4.4	Work with industry and farmers to improve energy efficiency and reduce emissions	<ul style="list-style-type: none"> – Update the online energy self-audit tool for farmers – Develop and promote guidance materials 	DPIPWE DPAC (TCCO)
4.5	Support the resilience of small- and medium-sized businesses to extreme events by extending the Disaster Planning and Recovery for Tasmanian Businesses project	<ul style="list-style-type: none"> – Deliver resources tailored to specific industry sectors – Conduct workshops with businesses 	DPAC (TCCO) State Growth
4.6	Provide information on climate change risks and opportunities to support future decision making for agricultural production	<ul style="list-style-type: none"> – Update the existing Enterprise Suitability Mapping project to incorporate climate change projections 	DPIPWE DPAC (TCCO)

Action		Milestones	Lead Agency Partner Agency
4.7	Reduce emissions from waste	<ul style="list-style-type: none"> – Develop a new waste management strategy for Tasmania which includes a focus on emissions reduction 	DPIPWE
4.8	Provide water surety for irrigation to underpin agricultural productivity in a changing climate	<ul style="list-style-type: none"> – Deliver the five proposed Tranche II irrigation schemes – Investigate the feasibility for a third tranche of irrigation development to connect, modernise and enhance Tasmania's irrigation network 	Tasmanian Irrigation DPIPWE
4.9	Invest in skills to prepare our industry sectors, regional communities and workforce for a changing climate	<ul style="list-style-type: none"> – Work with industry sectors and regional communities to identify skill needs – Subsidise relevant training 	State Growth



5

BUILDING CLIMATE RESILIENCE



By 2021 we will be:

- Using our evidence base to support decision making about how to adapt to our future climate; and
- A resilient community that is prepared for, and responds well to, extreme events.

A changing climate is likely to result in more frequent and severe extreme weather events,⁴ as well as changes to our coastline and ecosystems. We will need a shared response across all levels of government, businesses, natural resource management organisations and the community, to manage the associated risks and impacts from a changing climate.

Under a changing climate, Tasmania is expected to experience increased storm events and changes in rainfall patterns, which are likely to result in increased flooding, coastal inundation and erosion. We are also expected to experience longer fire seasons, with more frequent and intense bushfire events.⁵ Commencing in 2014-15, the Tasmanian Government committed \$28.5 million over four years to implement fuel reduction burns to mitigate the risks from bushfire. The 2017-18 Budget continues the commitment.

The Tasmanian Government has also delivered a \$250,000 research project on the impacts of climate change on bushfire risk in the TWWHA and appropriate firefighting responses.

There is more we must do to understand and manage the risks from climate change. By managing the risks, we will help minimise economic disruptions and allow communities to get back on their feet faster following extreme weather events. Although we cannot remove the risk entirely, we will be more resilient if we understand our risks and plan appropriately to lessen their impacts.

The actions for this priority area focus on:

- Helping Tasmanians to understand their risks from floods, coastal erosion and inundation, and other natural hazards;
- Building the capacity of Tasmanian Government agencies and local government to consider climate change risks in strategic planning, purchasing and decision making; and
- Supporting local government to manage risks to new and existing settlements from coastal hazards.

What we have done so far:

Undertaken and released **Tasmania's 2016 State Natural Disaster Risk Assessment**, with a greater focus on future risks

Invested in a **fuel reduction program**, which involves the Tasmania Fire Service, Tasmania Parks and Wildlife Service, Forestry Tasmania, local government, private contractors, landowners and industry, conducting strategic fuel reduction burns to reduce bushfire risk

Continued to deliver the **Community Protection Planning, Bushfire-Ready Neighbourhoods and Bushfire-Ready Schools programs** to assist communities at risk from bushfire

Sponsored research to **identify the future viability of planned burning** as a management tool for mitigating bushfire risk in a changing climate

Continued to participate in the **Bushfire and Natural Hazard Cooperative Research Centre**, which explores the causes, consequences and mitigation of natural disasters

Conducted the **TWWHA Bushfire and Climate Change Research Project** to investigate the impact of climate change on bushfire risk to Tasmania's wilderness areas, and appropriate management and firefighting responses

Conducted adaptation pathway planning with communities vulnerable to coastal hazards through the **Tasmanian Coastal Adaptation Pathways Project**. Most recently, TCCO has worked with communities in the municipalities of Hobart City, Huon Valley, Kingborough and Glamorgan Spring Bay

Progressed **land-use planning reforms** to manage natural hazards and climate impacts. Instruments under development include a Tasmanian Planning Policy on Hazards and Environmental Risks, and State Planning Provisions for natural hazards

Continued to implement a number of programs to **understand and manage the impacts of climate change on Tasmania's natural environment**, including documentation of vulnerable sites, maintaining and building ex-situ populations of vulnerable species, and prioritising conservation measures to improve ecosystem resilience

Action		Milestones	Lead Agency Partner Agency
5.1	Build community resilience to floods	<ul style="list-style-type: none"> – Implement a community project to raise awareness of flood risks – Implement a statewide system for flood warnings and alerts 	DPFEM (SES)
5.2	Help communities understand their exposure to natural hazards	<ul style="list-style-type: none"> – Develop online resources to provide households with information about their exposure to natural hazards 	DPAC (OSEM)
5.3	Work with local government and regional bodies to embed climate change adaptation into strategic and financial decision making	<ul style="list-style-type: none"> – Assess how local government is currently planning for climate-related risks – Prepare tailored climate change projection summaries for each local government area 	DPAC (TCCO)
5.4	Understand and manage the impacts of coastal hazards to existing settlements	<ul style="list-style-type: none"> – Work with coastal managers to identify risks to coastal settlements and values, and develop management options 	DPAC (TCCO, OSEM) DoJ
5.5	Examine the impacts of climate change on bushfire risk in the TWWHA and consider appropriate firefighting responses	<ul style="list-style-type: none"> – Consider and respond to the findings and recommendations of the independent report 	DPAC (TCCO) DPIPWE DPFEM
5.6	Ensure climate change is considered in Tasmanian Government decision making	<ul style="list-style-type: none"> – Work with agencies to embed climate change consideration into strategies and decisions, particularly relating to assets and infrastructure, and key growth sectors – Improve the consideration of climate change in purchasing decisions of Tasmanian Government agencies – Consider how agencies can better use timber products in purchasing to promote carbon storage 	DPAC (TCCO) Treasury
5.7	Mitigate risks from bushfire through fuel reduction burning	<ul style="list-style-type: none"> – Deliver a targeted program of burns to reduce fuel in areas that pose the greatest risk to the Tasmanian community 	DPIPWE

4. White CJ, Grose MR, Corney SP, Bennett JC, Holz GK, Sanabria LA, McInnes KL, Cechet RP, Gaynor SM & Bindoff NL 2010, *Climate Futures for Tasmania: Extreme Events Technical Report*, Antarctic Climate & Ecosystems Cooperative Research Centre, Hobart, Tasmania.

5. Fox-Hughes P, Harris RMB, Lee G, Jabour J, Grose MR, Remenyi TA & Bindoff NL 2015, *Climate Futures for Tasmania future fire danger: The Summary and The Technical Report*, Antarctic Climate & Ecosystems Cooperative Research Centre, Hobart, Tasmania.

SUPPORTING COMMUNITY ACTION



By 2021 we will be:

- **Taking action to meet a legislated target of zero net emissions by 2050, with access to relevant information and programs.**

The world has committed to keep the global temperature rise to below 2°C. Meeting this challenge is a shared responsibility that will require action from all Tasmanians.

In 2016, the Tasmanian Government commissioned an independent review of the *Climate Change (State Action) Act 2008 (the Act)*. This legislative requirement has been taken into account in preparing Climate Action 21.

One of the key areas for consideration is Tasmania's legislated emissions reduction target. The Act will be amended to establish a legislated target of zero net emissions by 2050. This aspirational long-term target signals the Tasmanian Government's commitment to action on climate change and is consistent with the Paris Agreement.

Tasmanian homes typically use more energy than those interstate. While there has been a decline in residential energy consumption in recent years, increasing numbers of Tasmanians are now on Aurora Energy's hardship program, with most being concession customers.⁶

There are considerable social and liveability benefits in improving household energy efficiency. It not only delivers savings on power bills, but can also improve the comfort, health and wellbeing of residents. For example, draught stopping and insulation makes homes warmer and more comfortable, and can reduce the incidence of respiratory illness.⁷

By informing Tasmanians about the steps they can take to reduce their emissions, and supporting their efforts, we can create a community approach to dealing with climate change.

The actions for this priority area focus on:

- Supporting households to achieve energy savings and access energy efficient technologies;
- Building community resilience to population health risks in a changing climate; and
- Amending the Act to establish an aspirational emissions reduction target and strengthen the legislative framework for action on climate change.

6. Office of the Tasmanian Economic Regulator 2016, *Energy in Tasmania – Performance Report 2014-15*.

7. Howden-Chapman P, Matheson A, Viggers H, Crane J, Cunningham M, Blakely T, et al, 2007. 'Retrofitting houses with insulation to reduce health inequalities: results of a clustered, randomised trial in a community setting.' In *British Medical Journal* 334:460-464.

What we have done so far:

Reduced our emissions by 95 per cent on 1990 levels, exceeding our legislated target of a 60 per cent reduction by 2050

Continued to **provide information to support community action** through the TCCO website

Developed **resources to help Tasmanians cope during extreme heat events and an alert system to better prepare health and emergency service providers to respond to these events**

Continued to **engage with schools on waste minimisation and resource efficiency**, including online tools and resources for teachers via the Environment Protection Authority website

Action		Milestones	Lead Agency Partner Agency
6.1	Legislate for a target of zero net emissions by 2050	<ul style="list-style-type: none"> Amend the Act to strengthen the framework for action on climate change, including establishing a new target to achieve zero net emissions by 2050 	DPAC (TCCO)
6.2	Deliver a home energy savings program	<ul style="list-style-type: none"> Deliver an energy efficiency program for low income households Provide energy efficiency information, and undertake energy efficiency audits and low cost upgrades 	DPAC (TCCO)
6.3	Support the aged care sector to prepare for, and respond to, extreme heat events	<ul style="list-style-type: none"> Develop and promote resources to help aged care facilities improve their practices and infrastructure 	DHHS
6.4	Identify additional policies and programs to respond to the potential health impacts of climate change	<ul style="list-style-type: none"> Deliver policies and programs to build community resilience to population health risks in a changing climate 	DHHS
6.5	Deliver an energy efficiency program for community sector professionals	<ul style="list-style-type: none"> Deliver an education program for community sector professionals to assist clients to reduce their energy use Develop tools and resources to support the delivery of the program 	DPAC (TCCO)

WHAT DOES A ZERO NET EMISSIONS TARGET MEAN FOR TASMANIA?

The Tasmanian Government will legislate for a new emissions reduction target of zero net emissions by 2050. This aspirational, long-term target means that by 2050 Tasmania's emissions will be balanced out by our carbon sinks.

This target is consistent with the Paris Agreement, which the Australian Government ratified in November 2016.

The Paris Agreement aims to achieve zero net emissions globally in the second half of the century.

Setting a zero net emissions target sends a clear signal of intent to Tasmanian businesses, giving them confidence to invest in low emissions options as we transition to a low-carbon economy.

There are a number of different pathways to meeting this target. The Tasmanian Government is committed to achieving zero net emissions while continuing to grow our economy. We will identify cost-effective and advantageous solutions to achieve zero net emissions by 2050. We will focus on actions that are complementary to national strategies and initiatives.

NEXT STEPS

Climate Action 21 is a coordinated approach to taking action to address climate change. Effective collaboration between all levels of government, non-government organisations, businesses, and the community, will be essential to successfully implement our actions.

To achieve good outcomes we will:

- Consider the best available evidence as we develop projects;
- Seek the views of others to inform the scope and delivery of projects;
- Be informed by a contemporary understanding of climate science;
- Assess and respond to risks and opportunities;
- Establish effective methods and timeframes for evaluation and review;
- Monitor and report publicly on progress; and
- Share information and learnings with others.

IMPLEMENTATION AND REPORTING

TCCO will develop an implementation plan to clearly outline timelines, outputs and performance indicators for each action. We will continue to engage with stakeholders and the community on specific actions.

Each year we will develop a progress report card which will outline the status of the actions and achievements, and identify future priorities.

TCCO will keep stakeholders and the community informed on the implementation of Climate Action 21 through various communications media, which will include its website, Facebook page and newsletter.

Greenhouse Gas Emissions Reporting

Under the Act, the Tasmanian Government is required to publish Tasmania's baseline and emissions reductions data on a yearly basis.

TCCO also releases an annual Tasmanian Greenhouse Gas Accounts report which provides a more detailed analysis of Tasmania's emissions by sector, and progress against the 2050 emissions reduction target.

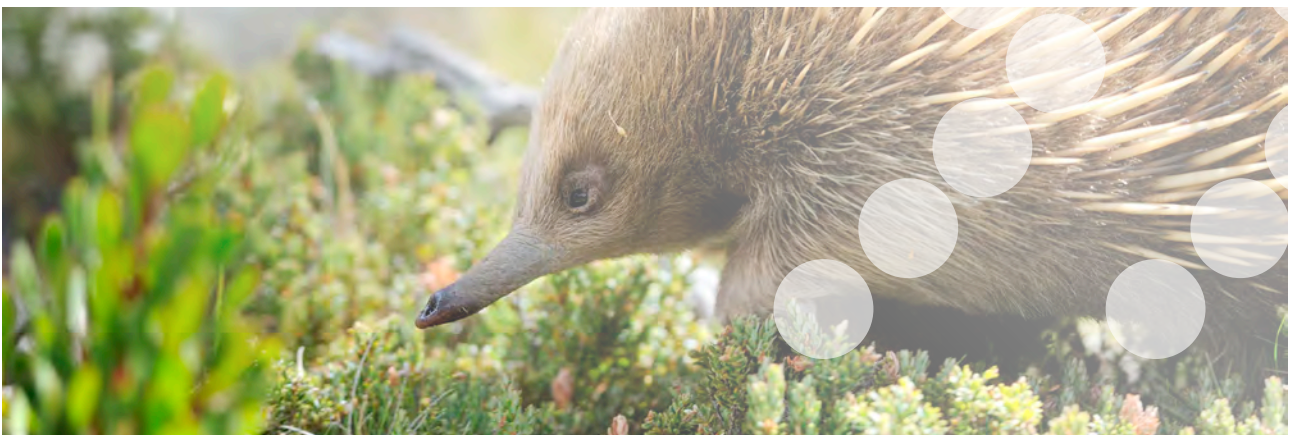
MONITORING AND EVALUATION

We will determine whether our actions are effective by undertaking monitoring and evaluation.

Lead Tasmanian Government agencies, in collaboration with partner organisations, will be responsible for monitoring and evaluating the actions they deliver; with oversight and assistance provided by TCCO.

Monitoring will be based on the milestones identified for each of the actions. Evaluation methods will be developed for each action, recognising that this will vary given the diversity of actions in Climate Action 21.

Learning from our experiences and sharing this information with others is a priority as we implement Climate Action 21 and build our capacity for effective action on climate change.



WORKING TOGETHER

Responding effectively to climate change requires a whole-of-community response. While the actions in Climate Action 21 will be led by Tasmanian Government agencies, many of these actions will assist others to take action.

The Tasmanian Government is responsible for:

- Working with other levels of government, businesses and the community to achieve outcomes;
- Communicating relevant, timely and accessible information to allow households and businesses to understand the issues and make appropriate choices;
- Delivering targeted programs to support climate change action by businesses, households and the community;
- Establishing an effective framework to support action by all Tasmanians;
- Reducing Tasmanian Government greenhouse gas emissions by taking action on energy and transport use; and
- Considering climate change in decision making and through procurement processes.

TCCO sits within DPAC and coordinates the Tasmanian Government's action on climate change. It partners with all tiers of government as well as industry, research institutions and the community. TCCO reports to the Minister for Environment and Parks.

Local government is the sphere of government closest to communities. It is responsible for the delivery of a wide range of services and management of assets. Local government can assist with informing and educating local communities about climate change, and considering climate change in their decision making.

The Australian Government sets the national agenda and policy framework for Australia's response to climate change, including action on energy efficiency, emissions monitoring and reduction, and renewable energy. The Tasmanian Government supports action on climate change which is complementary to Australian Government policies and programs.

Businesses and industry can consider the impacts of a changing climate by understanding the science and incorporating this into business planning. Businesses and industry can benefit from undertaking emissions-reduction activities through reduced overheads and improved productivity.

The Tasmanian community can contribute to the State's greenhouse gas emissions reduction efforts by incorporating simple measures into their lives.

The scientific and research community provides information and research to underpin action on climate change. Projections of our future climate are essential for informing decision making.



CLIMATE CHANGE IN TASMANIA

TASMANIA'S EMISSIONS

Under the Act, Tasmania has a legislated greenhouse gas emissions reduction target of at least 60 per cent below 1990 levels by 2050.

Tasmania's 1990 baseline greenhouse gas emissions were 19.4 mega-tonnes (Mt) of carbon dioxide equivalent (CO₂-e). The State's total greenhouse gas emissions for 2015 were 0.9 Mt CO₂-e, which is a 95 per cent reduction from the baseline.⁸

For the third year in a row, Tasmania has achieved its legislated emissions reduction target. The Tasmanian Government plans to build on this and will legislate for a new target of zero net emissions by 2050, as outlined in action 6.1.

Tasmania's total greenhouse gas emissions from the baseline year 1990 to the latest national inventory year of 2015 are shown in Figure 2. Also highlighted are the contributions of the various industry sectors.

Figure 2 shows the impact the reduction in greenhouse gas emissions from the land use, land use change and forestry (LULUCF) sector has had on Tasmania's total emissions. The emissions from the LULUCF sector changed from

a major source of emissions of 11.4 Mt CO₂-e in 1990 to a carbon sink of -7.0 Mt CO₂-e in 2015. The reduction in Tasmania's LULUCF emissions has been influenced by a number of factors including the volume of harvested timber, incidence of bushfires, local manufacture and export of wood products, fluctuations in global markets, and changes in accounting methodologies.

In 2015 the greenhouse gas emissions from Tasmania's energy sector were the State's largest at 3.7 Mt CO₂-e, however this is relatively modest compared with other Australian states due to our renewable energy resources. Emissions from our energy sector decreased by one per cent between 1990 and 2015.

Tasmania's agriculture sector contributed 2.1 Mt CO₂-e to our greenhouse gas emissions in 2015, which was mainly due to the digestive processes of cows and sheep. Emissions from Tasmania's agriculture sector decreased by almost nine per cent between 1990 and 2015.

The industrial processes and waste sectors were relatively minor contributors to Tasmania's total greenhouse gas emissions at 1.8 Mt CO₂-e and 0.3 Mt CO₂-e

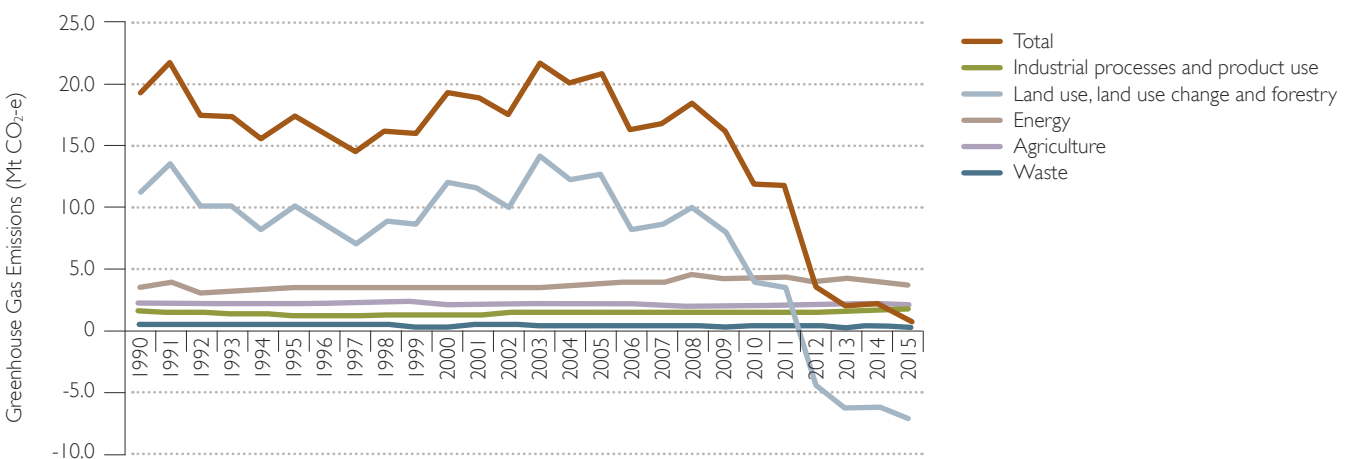
respectively. Emissions from the industrial processes sector rose almost 16 per cent between 1990 and 2015, while emissions from the waste sector fell by over 36 per cent in the same period.

Excluding the greenhouse gas emissions from the LULUCF sector, the annual emissions from the rest of the Tasmanian economy have reduced by two per cent between 1990 and 2015. This is a significant achievement given that Tasmania's gross state product (excluding the forestry industry) has increased by 58 per cent⁹ and our population has increased by over 11 per cent¹⁰ in the same period. These figures demonstrate that Tasmania has decoupled the historic link between economic growth and greenhouse gas emissions.

In 2015, Tasmania had the lowest annual average greenhouse gas emissions per capita of any Australian state or territory at 1.7 tonnes CO₂-e per person. This was due to a combination of Tasmania's high level of renewable hydro-generated electricity and a reduction in greenhouse gas emissions from the LULUCF sector.

FIGURE 2

TASMANIA'S GREENHOUSE GAS EMISSIONS FROM 1990 TO 2015, BY SECTOR



THE IMPACTS OF A CHANGING CLIMATE

There is now overwhelming evidence that the earth is warming and that our climate is changing.¹¹ Rising temperatures as a result of climate change will have a significant impact upon other climate variables such as rainfall, evaporation and sea level.¹² These changes are likely to amplify natural climate variability more broadly and result in more frequent and severe extreme weather events.¹³

ACE CRC's Climate Futures for Tasmania project is the most important source of downscaled projections for Tasmania. Through the Climate Futures for Tasmania project and other research undertaken by organisations such as CSIRO and IMAS, we have a much better understanding of how the Tasmanian climate is likely to change between now and 2100.

Tasmania's terrestrial environments are projected to experience a rise in annual average temperatures, significant changes in seasonal and regional rainfall patterns, an increase in rainfall intensity and associated flooding, and longer, more intense fire seasons.

Coastal and marine environments will be impacted by rising sea levels, an increase in storm instances and associated inundation and erosion, increasing water temperatures, ocean acidification and changing nutrient levels.

Figure 3 provides a summary of the projected impacts for Tasmania in a changing climate.

8. Australian Department of the Environment, 2017, *State and Territory Greenhouse Gas Inventories 2015*.
9. Australian Bureau of Statistics, 2016, *Australian National Accounts: State Accounts, ABS Cat. No. 5220.0*.
10. Australian Bureau of Statistics, 2016, *Australian Demographic Statistics, ABS Cat. No. 3101.0*.
11. IPCC, 2013. Summary for Policymakers. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [T.F. Stocker; D. Qin, G.K. Plattner; M. Tignor; S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
12. Grose MR, Barnes-Keoghan I, Corney SP, White CJ, Holz GK, Bennett JB, Gaynor SM and Bindoff NL 2020, *Climate Futures for Tasmania: General Climate Impacts Technical Report*, Antarctic Climate & Ecosystems Cooperative Research Centre, Hobart, Tasmania.
13. White CJ, Grose MR, Corney SP, Bennett JC, Holz GK, Sanabria LA, McInnes KL, Cechet RP, Gaynor SM & Bindoff NL 2010, *Climate Futures for Tasmania: Extreme Events Technical Report*, Antarctic Climate & Ecosystems Cooperative Research Centre, Hobart, Tasmania.



FIGURE 3
CLIMATE CHANGE PROJECTIONS AND IMPACTS FOR TASMANIA^{14, 15}

The Climate Futures for Tasmania (CFT) project is the most important source of climate change projections for Tasmania. Published by ACE CRC between 2010 and 2012, the CFT data presented the first fine-scale local climate information for Tasmania. Through CFT, we have a better understanding of how the Tasmanian

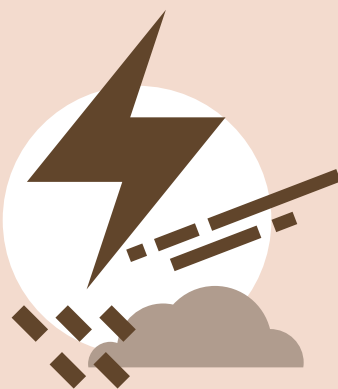
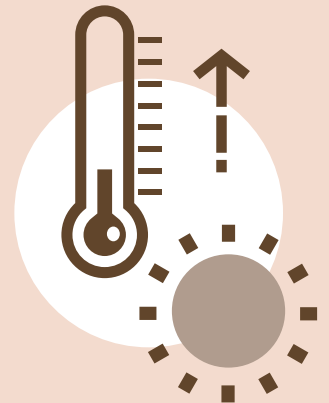
climate is likely to change between now and 2100, and what the likely impacts will be. Based on current global greenhouse gas emissions, Tasmania is projected to experience a rise in average annual temperature, significant changes to rainfall patterns, rising sea levels, and more frequent and intense extreme weather events.

Under a high emissions scenario, Tasmania is projected to experience the following changes:



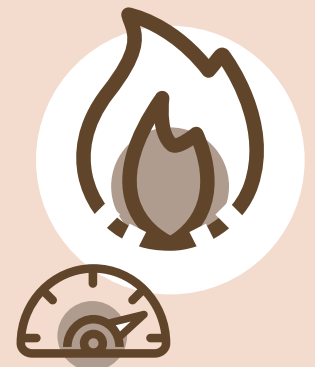
A SIGNIFICANT CHANGE IN RAINFALL PATTERNS FROM SEASON TO SEASON AND VARYING BETWEEN DIFFERENT REGIONS

A RISE IN ANNUAL AVERAGE TEMPERATURES BY UP TO 2.9°C BY 2100



AN INCREASE IN STORM INSTANCES, WHICH IS LIKELY TO RESULT IN INCREASED COASTAL EROSION AND INUNDATION

LONGER FIRE SEASONS AND MORE DAYS AT THE HIGHEST RANGE OF FIRE DANGER



14. ACE CRC 2010, *Climate Futures for Tasmania general climate impacts: the summary*, Antarctic Climate and Ecosystems Cooperative Research Centre, Hobart Tasmania.

15. Grose, M. et al., 2015, Southern Slopes Cluster Report, *Climate Change in Australia Projections for Australia's Natural Resource Management Regions: Cluster Reports*, eds. Ekström, M. et al., CSIRO and Bureau of Meteorology, Australia.



MORE HOT
SUMMER DAYS
AND MORE
**HEAT
WAVES**
THAN EXPERIENCED
IN THE PAST



SUBSTANTIALLY
REDUCED
INCIDENCE OF
FROST



AN INCREASE
IN OCEAN
ACIDIFICATION
LEVELS AND
EAST COAST WATER
TEMPERATURE
BY UP TO
2°C – 3°C
BY 2070, RELATIVE
TO 1990 LEVELS

SEA LEVEL
RISE

OF BETWEEN
0.39 AND 0.89m
BY 2090, ALTHOUGH
UNDER CERTAIN
CIRCUMSTANCES SEA
LEVEL RISES HIGHER
THAN THESE MAY
OCCUR





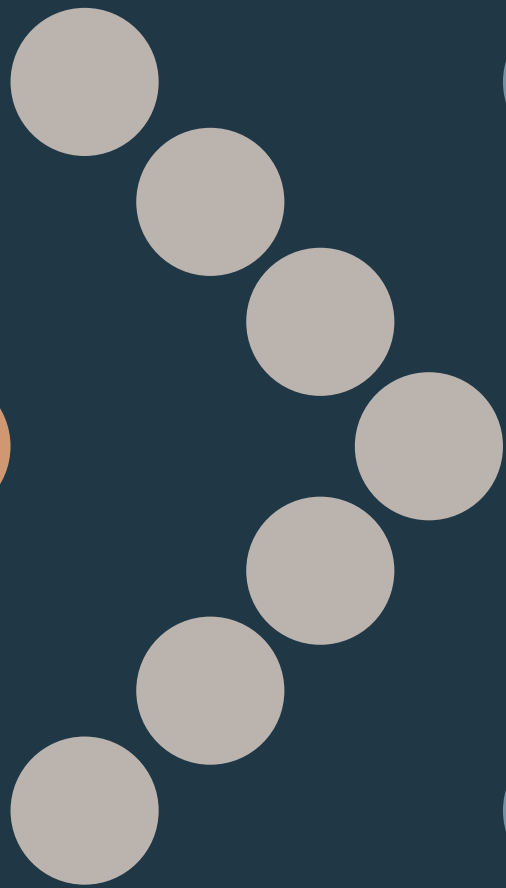
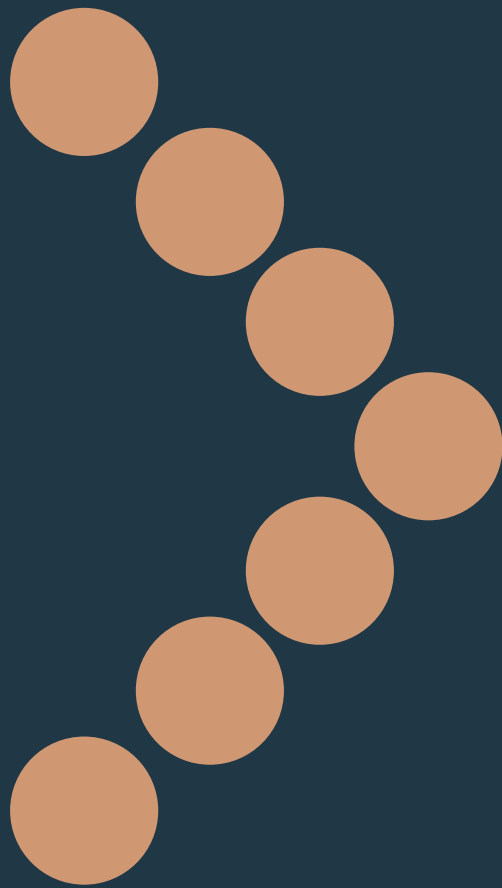
LIST OF ACRONYMS AND ABBREVIATIONS

ACE CRC	Antarctic Climate & Ecosystems Cooperative Research Centre
ARENA	Australian Renewable Energy Agency
Aurora Energy	Aurora Energy Pty Ltd
CFT	Climate Futures for Tasmania
COAG	Council of Australian Governments
Coordinator General	Office of the Coordinator General
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DHHS	Department of Health and Human Services
DoJ	Department of Justice
DPAC	Department of Premier and Cabinet
DPFEM	Department of Police, Fire and Emergency Management
DPIPWE	Department of Primary Industries, Parks, Water and Environment
EPA	Environment Protection Authority
EUA	Environmental Upgrade Agreement
IMAS	Institute for Marine and Antarctic Studies
LULUCF	Land Use, Land Use Change and Forestry
NEM	National Electricity Market
OSEM	Office of Security and Emergency Management
Paris Agreement	21st Conference of the Parties of the United Nations Framework Convention on Climate Change Paris Agreement
SES	State Emergency Service
State Growth	Department of State Growth
Tasmanian Irrigation	Tasmanian Irrigation Pty Ltd
TCCO	Tasmanian Climate Change Office
TEELS	Tasmanian Energy Efficiency Loan Scheme
Treasury	Department of Treasury and Finance
TWWHA	Tasmanian Wilderness World Heritage Area

MEASURES

CO₂-e	Carbon dioxide equivalent
kt	Kilotonnes
kW	Kilowatts
kWh	Kilowatt hours
ML	Megalitres
Mt	Megatonnes







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