

# WeatheringtheChange

THE ACT CLIMATE CHANGE STRATEGY 2007-2025



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While it may be tempting to put the excuse of short-term financial costs above the benefit of long-term abatement, if nothing is done the eventual outcome will be unaffordable in environmental, economic and social terms.

## Chief Minister's Message

The ACT Government accepts the overwhelming scientific evidence that the use of our planet and its resources has already and will continue to change our climate. The Government also accepts that unless action is taken now, climate change will seriously damage our natural environment, our quality of life, and our economy.

There is a high level of awareness in the community that the climate is changing but also frustration and confusion over what could or should be done and what individuals can do. Resolving the problem should not be the responsibility of any one sector in the community. The problem is shared and so too must be the solution.

The *ACT Climate Change Strategy* provides an overview of climate change science, the predicted impacts on the ACT and the Government's vision and direction for responding to climate change. It has evolved from a discussion paper released in March 2006, to which many submissions

from the public, business and community groups were received. It replaces the ACT Greenhouse Strategy 2000 and complements *People, Place, Prosperity and the Think Water, Act Water* Strategy that addresses long term Territory water needs.

The ACT Government is committed to leading the local response to climate change, but every member of the ACT community must participate – businesses, community groups, families and individuals.

The Strategy sets out the approaches the Government will pursue between now and 2025 to support the broader community response to climate change. Detailed Action Plans will be developed at regular intervals during the life of the Strategy. In this way, the Strategy will remain responsive to new knowledge and technological developments in Australia and internationally, and can be adjusted accordingly.

Climate change will remain a challenge for governments and communities far into the future. How we, as a community and a nation, respond to the challenges that climate change presents us will determine the quality of our lives and those of future generations.



THE ACT CLIMATE CHANGE STRATEGY 2007-2025



Australians recognise global warming as a serious and pressing problem and want action, even if it involves significant costs.



**ACT Target** A reduction of 60% of 2000 levels of greenhouse gas emissions by 2050.

# Executive Summary

## Climate Change – A Global Issue

The challenges posed by climate change are faced by everyone around the world and require concerted action if we are to avoid serious environmental, economic and social consequences.

While climate change is a natural process, it has been significantly accelerated by the emission of greenhouse gases, primarily through the use of fossil-based fuels. It is generally accepted by the international science community and a growing number of governments that the world must reduce its emission of greenhouse gases by 60% of emissions by 2050 if we are to limit average global warming to 2°C. Global warming greater than this is expected to cause dramatic and irreversible changes, such as the melting of the

Greenland ice cap and sea level rises, which in turn will lead to further catastrophic changes to our climate.

## The ACT Response

The ACT is a small contributor to global greenhouse gas emissions: we create about 1.2% of Australia's emissions, and Australia contributes about 1% of global emissions. However, the ACT community is ready to play its part in reducing emissions. Further, we will need to manage the risks posed by shifts in climate that will inevitably occur over the next century regardless of any future cut in emissions.

It is anticipated that in the future we will use less energy to support improvements to our lifestyle. We will use "greener" forms of energy rather than dirtier fossil fuels. We will plan our buildings and infrastructure to be more energy efficient and to withstand changed climate patterns. We will manage the risks that climate change poses for community health, agriculture, water availability, the natural environment and urban planning.

# THE ACT CLIMATE CHANGE STRATEGY 2007-2025



This *ACT Climate Change Strategy 2007-2025* builds on the lessons of the *ACT Greenhouse Strategy 2000* and outlines how the community, with strong leadership from the Government, will address climate change between now and 2025.

To be serious about reducing emissions we must set ourselves goals in order to prevent further and possibly catastrophic changes to our climate, and to prepare ourselves to deal with the changes now occurring and likely to occur over the next 30 to 50 years.

That's why the ACT will pursue a target of reducing greenhouse gas emissions by 60% of 2000 levels by 2050.

This is an appropriate long-term target for the ACT, in line with international and other Australian jurisdiction targets. The Government will work to ensure that its own operations contribute to meeting this target.

To measure our progress in reaching this target, the ACT will aim for a milestone of limiting 2025 greenhouse gas emissions to 2000 levels.

Detailed Action Plans will be issued at regular intervals during the life of the *Strategy*. In this way, the *Strategy* will remain responsive to new knowledge and technological developments in Australia and internationally, and can be adjusted where necessary.

ACT Climate  
Change Strategy  
2007-2025

ACTION PLAN 1  
2007-2011

ACTION PLAN 2  
2012-2016

ACTION PLAN 3  
2017-2020

ACTION PLAN 4  
2021-2025

The *Strategy* and subsequent Action Plans address four objectives:

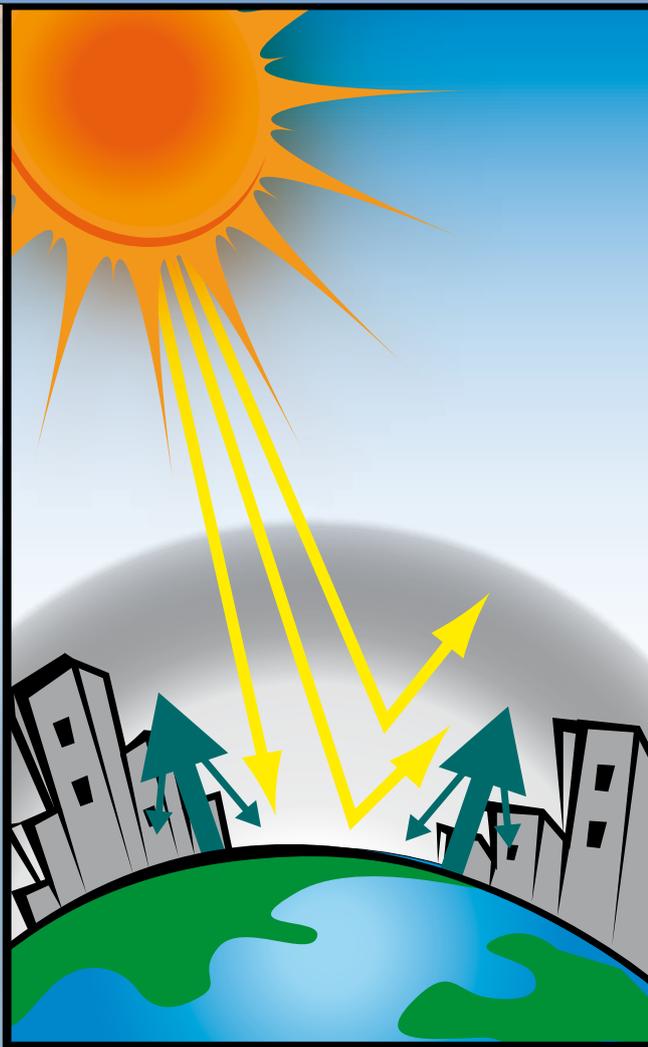
- *to be smarter in how we use resources;*
- *to design and plan our city to be more sustainable;*
- *to build our capacity to adapt to and manage the changes to climate that we are now beginning to face, and possible future changes; and*
- *to improve our understanding of climate change, its causes and effects, and how we need to respond.*

Success will require action by everyone: governments, businesses, community groups, households and individuals. Progress must be made in collaboration with adjacent regions in south eastern Australia, with other State and Territory governments, with the Commonwealth, and with other countries.



Human activities – particularly burning fossil fuels (coal, oil and natural gas), agriculture and land clearing are generating more greenhouse gases. Greater concentrations of greenhouse gases will trap more heat and raise the Earth's surface temperature

## Enhanced Greenhouse Effect



The greenhouse effect is an important natural phenomenon. Greenhouse gases absorb and re-radiate the sun's warmth, and maintain the Earth's surface temperature at a level necessary to support life. However, sound evidence confirms that human activities, particularly the use of fossil fuels (coal, oil and natural gas), broad scale deforestation, and land use changes, result in increases in the atmospheric concentrations of greenhouse gases (including carbon dioxide, methane and nitrous oxide). This is known as the *enhanced* greenhouse effect and is scientifically accepted as being primarily responsible for the rise in global temperatures recorded through the previous and current centuries. Evidence that the world's climate could be changing because of this effect has been available to the public since the mid 1970s.

Even a small change in atmospheric temperature will have a significant effect on our climate, changing global rainfall and the incidence of extreme events such as storms, cyclones and droughts. ACT residents are already aware of the significant impact drought and bushfire can have on our community.

**Figure 1.** The enhanced greenhouse effect.

Diagram courtesy of the Australian Greenhouse Office  
<http://www.greenhouse.gov.au/science/qa/pubs/science-qa.pdf>.



## Climate Change Science and Policy

Scientific evidence shows that accumulated greenhouse gas emissions have already changed climate around the world and will continue to do so. The international debate about how to respond has shifted from simply cutting the emission of greenhouse gases (though this is still an important action) to learning how to live with the changes that are now inevitable.

Climate change is not an exact science. While global climate models predict with some confidence increases in global warming in the next century, predictions of future climate change at a regional level are difficult to make. This difficulty arises due to the many variables involved,

including vegetation and topology. Climate change science is constantly improving and with every advance a better understanding is achieved. A lack of certainty is not a good enough reason not to act.

The United Nations and World Meteorological Organisation established the Intergovernmental Panel on Climate Change (IPCC) to produce regular reports on the science of climate change. The IPCC's *Fourth Assessment Report*, released in 2007, found that there will be a probable average surface temperature increase of between 1.8°C and 4°C by the end of the century and that most of the observed warming over the past 50 years can be attributed to increases in greenhouse gas concentrations<sup>1</sup>. Further, it identifies the importance of adaptation in addressing impacts resulting from warming due to past emissions.

In 2005, the British Treasury commissioned the *Stern Report: The Economics of Climate Change*. This landmark report, endorsed by UK and European economists and scientists, concludes that climate change will have

Delaying or ignoring a response would be dangerous and much more costly in the long term.

There will be a probable average global surface temperature increase of between 1.8C and 4C by the end of the century.

significant negative effects on the economy and all basic needs of societies. It says stabilising emissions is possible and the costs, while significant, are manageable. Further, it says delaying or ignoring a response would be dangerous and much more costly in the long term<sup>ii</sup>.

Australia's governments, both individually and as a group, have acknowledged the existence and pressing nature of climate change.

Since 2005 the States and Territories have worked to develop the outline of a National Emissions Trading Scheme that will stimulate the market to deliver cost-effective emissions reductions and allow Australia to join other global emissions trading markets.

In February 2006 the Council of Australian Governments (COAG), which includes the Prime Minister and all State and Territory First Ministers, agreed to develop a new national Climate Change Plan of Action and to establish a high-level, inter-jurisdictional Climate Change Group to oversee implementation of the Plan's recommendations.

In February 2007 a *Declaration on Climate Change* was signed by Premiers and Chief Ministers of the State and Territory Governments. The Declaration will be used as the basis for a national approach to the challenges of climate change. It sets out principles, including the need for a collaborative response, and a series of actions, including a national summit on climate change.

In April 2007 COAG endorsed a framework for adaptation action to guide actions by the States and Territories in the area of adaptation. The Commonwealth announced it would fund an Australian Centre for Climate Change Adaptation. COAG also agreed to establish a mandatory streamlined national greenhouse gas emissions and reporting system and to develop technology roadmaps to facilitate the commercialisation of hydrogen, geothermal, solar thermal and coal gasification technologies.

### Abatement and Adaptation

Abatement acts on a global level over long time scales, slowing the rate of climate change and delaying or deferring the date of impact and its magnitude. While we may contribute only a very small amount to global emissions, as good global citizens we must take responsibility for our own emissions and work to reduce them.

Adaptation strategies can reduce our vulnerability to changes in climate at the local and regional level and over short time scales. They allow communities to develop a capacity to avoid or minimise the negative effects of climate change.

Solutions must focus on both abatement and adaptation.



**Abatement** – any action to reduce the emission of greenhouse gases from human activities – eg installing energy efficient light bulbs.

**Adaptation** – any action to respond to the anticipated or actual conditions related to climate change – eg the development of future water options.

## Our Challenge

A recent poll found that nearly 70% of Australians recognised global warming as a serious and pressing problem and wanted action, even if it involved significant costs<sup>iii</sup>. The *Stern Report* has identified that action on climate change is required across all countries and that action to reduce emissions need not cap the aspirations for growth of rich or poor countries<sup>iv</sup>.

The ACT faces four challenges.

**First**, we must understand the climate changes that will occur in this region, their causes and impacts.

**Second**, we must decide upon a meaningful contribution to a national reduction of greenhouse gas emissions, given our small size, the nature of our industries and our inability to influence the actions of others beyond our borders.



ACT is expected to experience the following climatic changes: higher temperatures; increased winds in summer months; drier average seasonal conditions; increased frequency of extreme weather events including storms; and increased risk of bushfire.

**Third**, we must stabilise rising per capita consumption of energy and, over time, reduce it whilst allowing for sustainable growth.

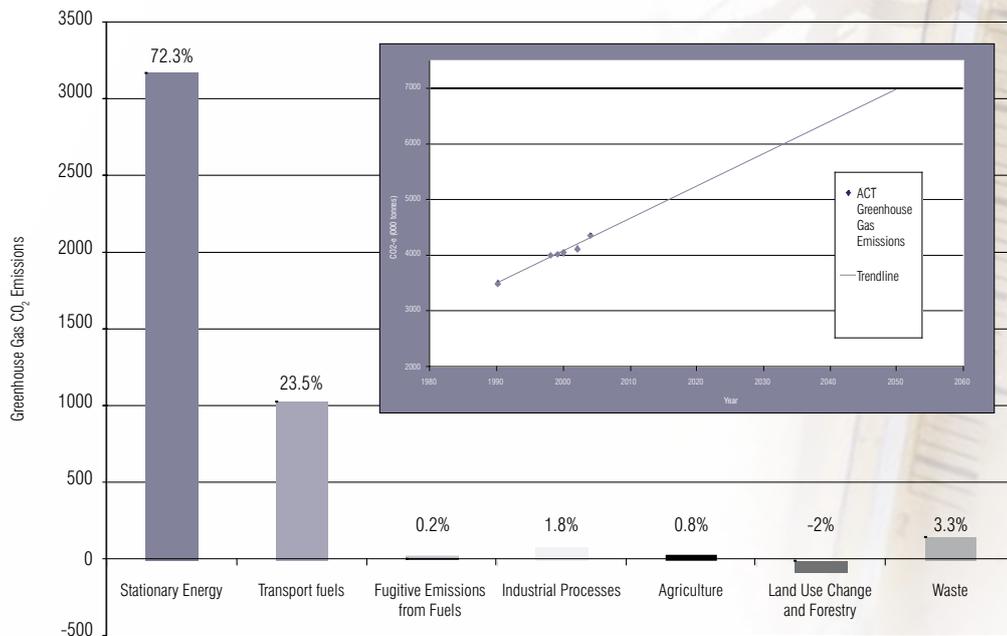
**Fourth**, we must take the actions necessary to prepare ourselves for the changes in climate that we now face, and will face in the future.

### ACT Emissions

The ACT consumes about 1.2% of Australia's energy and contributes about the same percentage of the nation's greenhouse gas emissions. However, while the ACT

may have the smallest emissions as a jurisdiction, its household electricity consumption per person is well above the national average.

As shown in Figure 2, most of the ACT's greenhouse gas emissions are created by its heavy and increasing use of electricity (and gas) to heat, cool and light houses, offices and other buildings, and our transport system. This is significantly different to the national profile, reflecting the lack of industry and agriculture in the ACT, a transport system dominated by private vehicles (a legacy of how Canberra was designed), and our climate, with its summer and winter extremes.



**Figure 2.** ACT Emissions Profile 2005 and Emission Trend<sup>v</sup>

The ACT currently emits approximately 4.45 million tonnes of greenhouse gases per year. Our per capita emissions have increased by nearly 10% since 1990 to 13.7 tonnes per person. As Figure 2 shows, emissions are expected to increase if there are no changes to current practices.

**How will the ACT be affected?**

The CSIRO has developed future predictions for southeast NSW, including the ACT.

**Temperatures**

The temperature in the ACT and surrounding region is likely to become warmer over the coming decades, with more hot days and fewer cold nights. The number of days in Canberra above 35°C could average 6-14 (now 5), while the number of days below 0°C could average 35-57 (now 62)<sup>vi</sup>. This increased demand carries the potential risk of an energy system failure. Conversely there will be a reduced energy demand in winter for heating<sup>vii</sup>.

	Now	2030	2070
Days Below 0oC	62	39-60	9-52
Cold Spells Below 0oC	12	7-12	1-10
Days Exceeding 35oC	5	6-13	8-42
Hot Spells Above 35oC	1	1-2	1-9
Days Exceeding 40oC	0	0-1	0-10
Very Hot Spells Above 40oC	0	0-0	0-1

**Table 1.** Summary of ACT temperature conditions, now, the year 2030 and the year 2070<sup>viii</sup>

**Rainfall**

The ACT is expected to experience little change in total annual rainfall, but:

- the ACT region will experience 4 to 12% wetter conditions in summer and autumn;



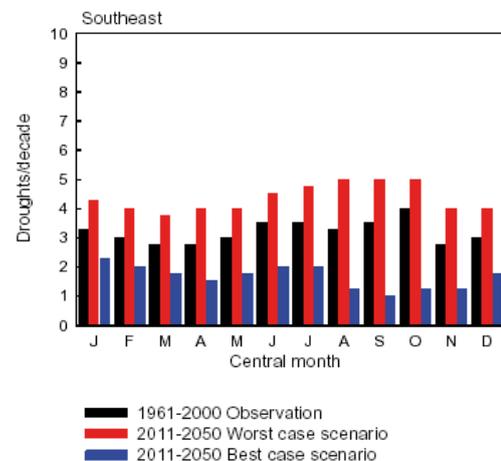
- the ACT region will experience 2 to 12% drier conditions in winter and spring<sup>ix</sup>; and
- more intense storm events.

Greater run-off from storms and higher evaporation from overall higher temperatures will lead to less water being available for consumption both by the community and the natural environment and decreases in water quality.

### **Droughts**

Droughts are likely to become more frequent and more severe. Climate change projections for Southeast NSW indicate there is a tendency toward an increase in droughts, especially in winter and spring. By 2030, the frequency is increased by about 70% for the worst-case scenario (decreased rainfall) and decreased by 35% for the best-case scenario (increased rainfall).

The range of uncertainty is much larger by 2070, when drought frequency could increase by more than 200% or decrease by up to 70%.



**Figure 3.** Observed (1961-2000) and projected (40 years centred on 2030) drought frequencies per decade for low and high rainfall change scenarios in south east NSW .

**Winds**

The CSIRO predict increases in average wind-speeds across much of NSW in summer. This will be seasonal with autumn winds likely to be weaker in the south and east, and stronger in the northwest. In winter there is a predicted tendency toward increased wind speeds in the far northwest and south and decreases elsewhere. A tendency for stronger winds is evident in spring, with greatest increases across central NSW.

Data from insurance companies indicate that severe winds account for around 40% of damage to Australian residential buildings, significantly greater than the damage caused by other natural hazards such as floods (22%), bushfires (19%), and earthquakes (6%)<sup>x</sup>.

**What will this mean for Canberrans?**

Climate impacts will have effects on all of our society and our urban and natural environment. These are shown in Figure 4.

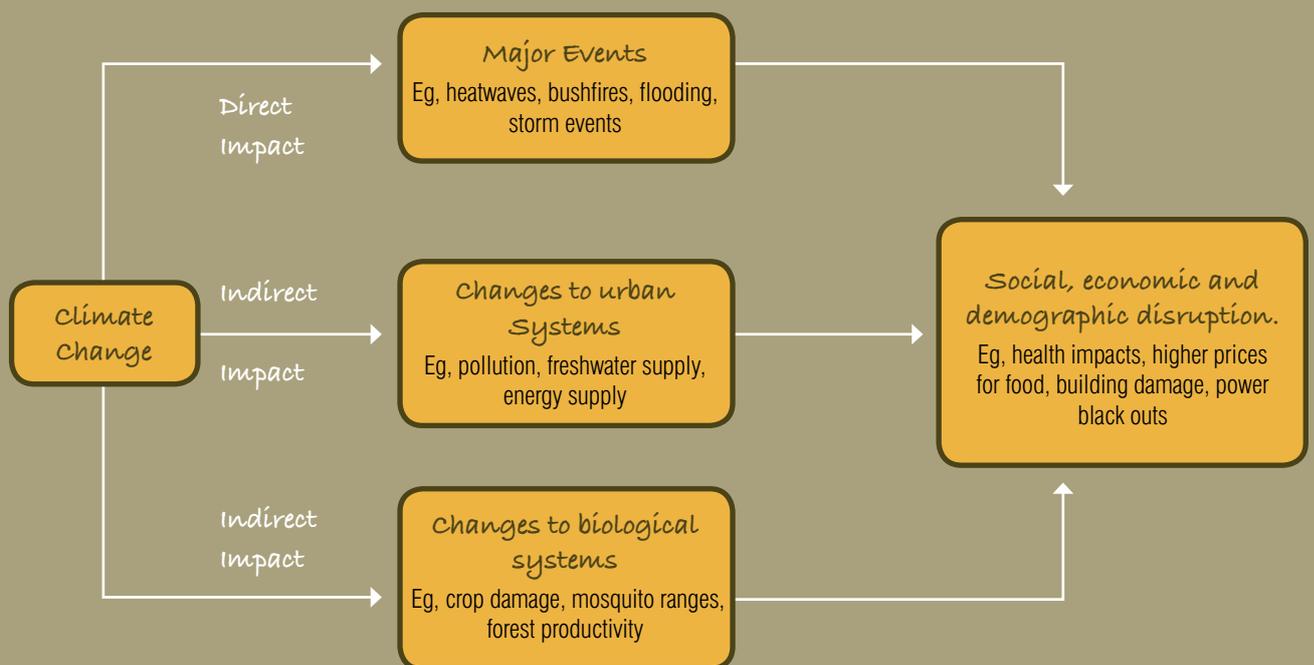


Figure 4. Climate Change and Community Pathways (adapted from McMichael, 2006)



Climate change and population ageing may increase annual heat-related deaths in those aged over 65, from 14 deaths per year at present in Canberra to 37-41 by 2020 and 62-92 by 2050 .

Climate change will bring with it health impacts. These include:

- temperature-related illness and death – due to increased temperatures and heatwaves;
- food and water-borne diseases – due to changes in water quality and the range of bacteria and pests;
- respiratory disease – due to increased pollution;
- mental health disorders – due to social disruptions;
- vector-borne disease – from a change in the range of mosquitoes and other disease-carrying species; and
- injury, trauma and related effects – from an increase in extreme weather events.

Climate warming and population ageing may increase annual heat-related deaths in those aged over 65, from 14 deaths a year at present in Canberra to 37-41 by 2020, and to 62-92 by 2050<sup>vi</sup>.

In urban areas, we can expect increases in extreme weather events such as storms, with increased wind and storm

damage, flash-flooding, strains on sewerage and drainage systems, greater insurance losses, possible power black-outs, and challenges for emergency services.

A greater fire risk is predicted. By 2020 the predicted number of days with very high or extreme fire danger could average 26-29 in Canberra (now 23)<sup>vii</sup>.

Water resources are likely to be further stressed due to projected growth in demand from progressive growth and climate-driven changes in supply for irrigation, cities, industry and environmental flows. Little change in annual rainfall, combined with higher evaporation and increased demand would reduce run-off into rivers, leading to decreases of up to 20% in the ACT's Cotter and Googong catchments<sup>viii</sup>.

The impact of the predicted increase in storm events may lead to an increase in runoff if the catchment is unable to absorb the rainfall. However, if the catchment is dry

and able to absorb the run-off, storms could lead to a decreased runoff<sup>xiv</sup>. Either way, storm events are likely to affect water quality.

Changes in water availability, temperatures and bushfires will also affect our natural environment. Aquatic ecosystems are likely to be stressed. Local land ecosystems will be affected by decreasing water availability, increased bushfires and changes in the distribution and number of pests<sup>xv</sup>. Species that rely on a particular habitat and climate, such as the corroboree frog and many alpine and sub-alpine species, are likely to suffer and may eventually become extinct. Soil loss from drought, floods and degradation will increase, further stressing ecosystems and making sustainable land management increasingly important.

While low to moderate increases in warming may help plant growth, especially frost-sensitive crops such as wheat, a greater number of hot days and a decline in available water will most likely reduce yields. A 10% - 40% reduction in snow cover is likely by 2020<sup>xvi</sup>, affecting ski resorts and alpine ecosystems<sup>xvii</sup>. This will affect not only Canberrans who previously enjoyed proximity to the snow, but also the tourism industry. In addition, reduced snow and snowmelt could further reduce water quality and availability and lead to species decline.



**ACT Target** A reduction by 60% of 2000 levels by 2050 with a milestone of limiting 2025 emissions to 2000 levels.

## Our Response

The ACT Government is committed, through its “*People, Place, Prosperity*” policy to creating a more sustainable community. Climate change has the potential to undermine this commitment. The rate and extent of climate change has increased as a result of human activities that emit large volumes of carbon-based gases.

The *ACT Greenhouse Strategy 2000* has guided actions relating to climate change over the past six years. It was based on the best available knowledge at the time of writing and had as its focus greenhouse gas emissions. Since the release of the *Greenhouse Strategy 2000* the ACT Government has implemented many programs and policies to reduce our emissions. Key policy and programs currently in place to address climate change include:

- ***The Greenhouse Gas Abatement Scheme (GGAS).*** This is the single most effective greenhouse gas abatement measure currently available to the Territory. The objectives of GGAS are to reduce greenhouse gas emissions associated with the production and use of electricity and to develop and encourage activities to offset the production of greenhouse gas emissions. Over the past two years, this scheme has reduced greenhouse emissions by 523,741 tonnes of CO<sub>2</sub>e - equivalent to taking 121, 800 vehicles off ACT roads for a year.
- ***ACT EnergyWise and HEAT programs.*** These programs provide advice on reducing energy use in homes and encourage Canberrans to audit their own energy use.
- ***Energy Efficiency Ratings.*** The ACT is the only jurisdiction that has in place mandatory disclosure of house energy rating at point of sale.
- ***Government renewable energy purchase.*** The ACT Government has increased the proportion of power it purchases from green sources to more than 20%.
- ***Compressed Natural Gas Buses.*** The ACTION Bus fleet now has 54 compressed natural gas (CNG) buses representing 14.2% of the fleet. ACTION is continuing to increase the number of CNG buses in the fleet.
- ***Methane gas extraction.*** Methane from the Mugga Lane and West Belconnen landfills is captured and used to produce green electricity. In 2005-06 methane from Mugga Lane and West Belconnen landfills was used to generate 27,268,744 kWh of electricity in the ACT (about 0.75% of ACT electricity use). All of this is purchased by the ACT Government.
- ***Planning practices.*** The ACT is using contemporary planning practices and responding to current environmental issues in structure and concept planning for Bonner, East Gungahlin and Molonglo.

Further information on action the Government has already undertaken to address climate change is provided in Action Plan 1.

## Principles

To address climate change in the ACT, the Government recognises and accepts that:

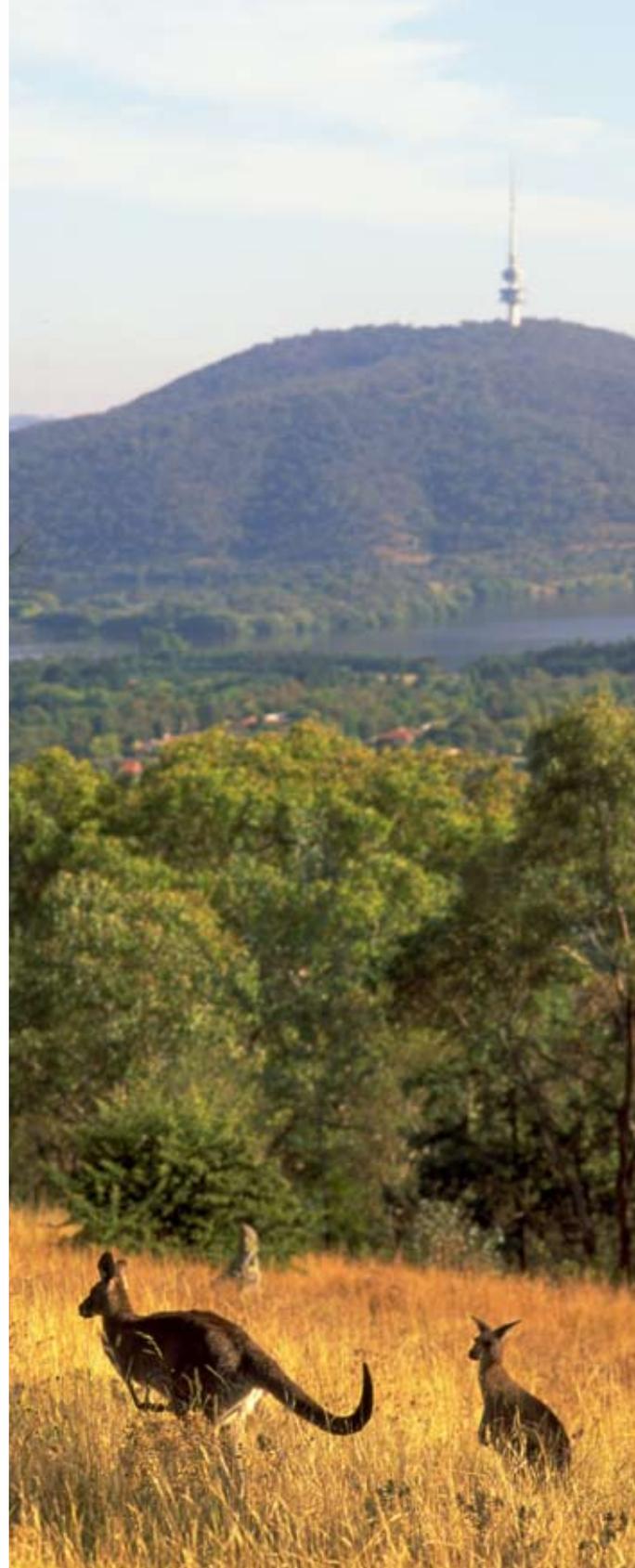
- the scientific fact of climate change is irrefutable;
- a lack of scientific certainty should not be an excuse for inaction (the precautionary principle);
- early action is more cost-effective than late action;
- responding to climate change requires a collective responsibility by everyone in the community and government has a responsibility to lead;
- a collaborative response by governments — regionally and nationally — is more effective than governments acting separately;
- adaptation to future climate change is where the greatest change at the local-government level can be effected;
- adaptation and abatement efforts are more effective when they are applied together; and
- integrating climate change-related actions into existing plans and strategies is an effective means of delivering actions by government agencies.

## Emission Targets

Our goal is to stabilise (and over time reduce) emissions, so as to prevent further and possibly catastrophic changes to our climate, and to prepare ourselves to deal with the changes now occurring and likely to occur over the next 30 to 50 years.

Australia contributes only about 1% of global emissions and the ACT's annual emissions represent less than one month's growth in emissions from China. Nonetheless, the ACT Government accepts that this is no excuse for inaction.

The ACT will adopt a target that will require joint action by Government, business and the community. The target



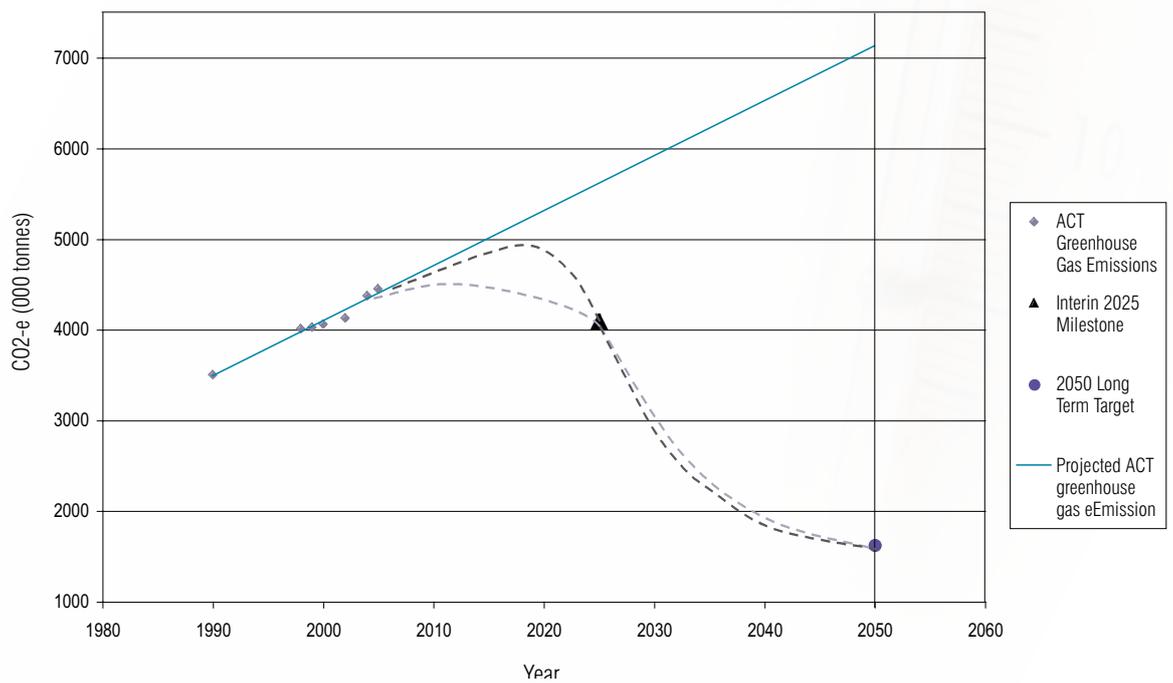


is to reduce emissions by 60% of 2000 levels by 2050. This will equate to reaching a target of 1,623,400 tonnes of greenhouse gas emissions by 2050. In 2005 the ACT produced 4,448,000 tonnes of greenhouse gas emissions.

The ACT Government believes that a reduction in emissions by 60% of 2000 levels by 2050 is an appropriate and realistic long-term target. In adopting

the target we are aligning ourselves with other Australian and international jurisdictions. The target is supported by scientific research as being necessary to prevent irreversible and catastrophic changes to the world's climate.

To measure progress in reaching this target, the ACT will aim for a milestone of limiting emissions to 2000 levels, or 4,059,000 tonnes of greenhouse gas emissions, by 2025.



**Figure 5.** Emission Trends and Targets

Even with the Government's best efforts it will not be possible to deliver an immediate cut in emissions. Our aim is to stabilise emissions and then reduce them over time. It is not possible to predict with accuracy the path of emission reduction. Our emissions will be determined by actions here, actions nationally and globally, as well as by external pressures such as population growth. Figure 5. illustrates two possible emission projections.

There is likely to be an increase in our emissions before abatement actions, both existing and planned, will start to make significant reductions.





## Objectives

There is no single solution to addressing climate change. This Strategy has four objectives.

### **1. To be smarter in how we use resources.**

Most ACT greenhouse gas emissions are caused by our heavy and increasing use of electricity (and gas) to heat, cool and light our houses, offices and other buildings and in producing the goods and services we consume. The average household produces about 14 tonnes of greenhouse gases a year.

To reduce our greenhouse gas emissions and adapt to a low-carbon future, we need to be smarter and more efficient about how we use our resources. For example, every degree a thermostat is lowered will reduce emissions and can save up to 10% of building heating costs.

### **2. To design and plan our city to be more sustainable.**

Smart building design can reduce the amount of resources we use. Being sustainable in how we design our suburbs and infrastructure can help reduce our greenhouse gas emissions and our reliance on private vehicles. Sustainable transport options need to become an integral part of our city design. Maintaining and extending our urban forestry is important and often ignored. Urban green areas can provide corridors for species to move through and play a role in cooling the city and reducing our emissions.

### **3. To build our capacity to adapt to, and manage the changes to climate that we are now beginning to face, and possible future changes.**

Even if we stopped producing greenhouse gases now, the climate would still change in response to gases already

emitted. Adaptation strategies can reduce the vulnerability of the community to the effects of climate change. For example developing options for future water use will allow our water infrastructure to cope with the changes in demand and supply that may occur due to climate change.

**4. To improve our understanding of climate change, its causes and effects, and how we need to respond.**

In order to confront the challenge of climate change, there must first be an understanding of what that challenge is, and how we can meet it on a daily basis in our every day

activities. It is about understanding what we can do as individuals and within a community, and how we teach our children, so that living sustainably within their environment becomes second nature.

The consequences and solutions to climate change are complex, wide-ranging and at times controversial. The Government has a role to play in increasing our knowledge by encouraging research into the impact of climate change and improving awareness of the subject within Government and in the community.





## Monitoring our Progress

The ACT Government currently monitors ACT greenhouse emissions. Using 2000 emissions as a baseline, the Government will continue to monitor emissions against the target. The passage of the *Fuel Sales Data Amendment Act 2007* is an example of the Government's commitment to accurately track our emissions.

The ACT Government will establish a monitoring and reporting framework to measure both its own progress and that of the ACT community in meeting the climate change challenge.

Action Plans will include specific targets and performance measures. These Action Plans will be developed for 2007-2011; 2012-2016; 2017-2020 and 2021-2025. The first of these has already been developed. Further monitoring and evaluation will, where practical, be part to the design and planning of each action to determine its effectiveness in helping realise the objectives of this Strategy.

Reports will be made annually to both the Government and the community on:

- the level of ACT greenhouse gas emissions; and
- the effectiveness of actions taken to abate emissions and to adapt to changes.

## Further Reading

For further information on climate change and its potential impacts, the following books and documents provide an interesting and accessible analysis.

Australian Business Roundtable of Climate Change, 2006. *The Business Case for Early Action*. Australia. <http://www.businessroundtable.com.au/html/documents.html>

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