



**ACT**  
Government

Environment and  
Sustainable Development



# AP2

A new climate change strategy and  
action plan for the Australian Capital Territory





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## MINISTER'S INTRODUCTION

AP2 is a second action plan and update to the Territory's 2007 Climate Change Strategy: *Weathering the Change*. It provides a pathway to achieve the Territory's legislated 2020 greenhouse gas reduction targets, and a set of actions to progress the strategy to its next review point in 2015.

The ACT has the most ambitious greenhouse gas reduction targets of any jurisdiction in Australia. The *Climate Change and Greenhouse Gas Reduction Act 2010* formalised the ACT targets of zero net emission (carbon neutrality) by 2060 and a 40% reduction in greenhouse gas emissions from 1990 levels by 2020.

These targets are born of necessity. The overwhelming weight of scientific evidence indicates that our current patterns of production and consumption, particularly our burning of non-renewable fossil fuels, are not sustainable. Fortunately, continuing rapid developments, including in renewable energy and energy efficiency technologies, provide us with a pathway to transform our city. We can continue to grow and prosper while reducing our emissions and demonstrating leadership to other communities in Australia and in advanced and developing economies around the world.

Addressing climate change requires a global commitment to stabilise greenhouse gas concentrations in the atmosphere, and is a shared responsibility that all countries and communities must embrace. Leadership must be demonstrated at the local, regional, national, and international levels through effective policies and actions.

Addressing the challenge posed by climate change requires action by everyone in our community - government, business, community groups, households and individuals. We must all understand that while the impact of our individual choices may be small, together we can make a difference to enhance the future wellbeing of people and our environment.

Much is made of the costs and subsidies required in transitioning to a low carbon economy, however often these discussions only deal with half of the story. The truth is that continuing on a high emissions pathway also involves costs and subsidies – such as the subsidies paid by future generations in the form of lost productivity from a degraded natural environment.

Analysis for AP2 shows that strong action on climate change is affordable, and the value of energy and fuel savings can greatly, if not entirely, offset required investment costs.

The ACT Government has undertaken a comprehensive consultation through the development of AP2. Through this process the ACT community has expressed its commitment to strong action locally while allowing flexibility for the ACT to manage its transformation to a carbon neutral city in a cost-effective manner. I would like to express my gratitude to everyone who provided feedback on Draft AP2 through the public consultation process.



**Simon Corbell MLA**

Minister for the Environment and Sustainable Development





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## EXECUTIVE SUMMARY

### A call to action

The Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, released in 2007, found that the average global surface temperature is expected to increase between 1.8 and 4°C by the end of the century. Australian average temperatures are projected to rise by 1.0 to 5.0°C by 2070.

An increase of greater than 2°C in average global temperatures is expected to cause dramatic and, in some cases, long term changes such as accelerating the melting of the Greenland ice cap with associated sea level rises. As the area covered by land and sea-ice diminishes, heat ordinarily reflected by snow would in turn be absorbed, further amplifying changes to our climate. The latest observations confirm that global-average mean sea-level rise since 1990 is near the high end of projections in the IPCC's Fourth Assessment Report.<sup>1</sup>

Through the IPCC, the international scientific community tells us that in order to avoid the most catastrophic effects of climate change, the increase in average global temperature must not exceed 2°C. To achieve this, global greenhouse gas emissions must be reduced by at least 80% below 1990 levels by 2050. For industrialised countries, the main producers of greenhouse gas emissions, the proposed target is 40% by 2020.

Consistent with this finding, in November 2010, the Legislative Assembly passed the *Climate Change and Greenhouse Gas Reduction Act 2010* which established ACT emissions reduction targets of:

- zero net greenhouse gas emissions by 2060
- peaking per person greenhouse gas emissions by 2013
- 40% below 1990 levels by 2020, and
- 80% below 1990 levels by 2050.

*Weathering the Change: Action Plan 1*, released in 2007, was the ACT's first package of measures to address climate change in the ACT. Action Plan 1 established a series of actions to not only reduce emissions, but also increase awareness and knowledge of climate change across government and through our community.

AP2 sets out a strategic pathway with options for incremental implementation, subject to annual reviews and the Government's budget process. AP2 will guide the Territory's strategy to meet our 2020 greenhouse gas reduction targets and set us on the path to becoming a sustainable and carbon neutral community. It is driven by our commitment, as a community, to address climate change and an understanding that we, as a community working together, can make a small but positive contribution to the global climate change mitigation effort.

The ACT Government is mindful that some measures proposed as part of this strategy may impact the cost of energy for the community. For that reason, implementation at each step of the way will be subject to thorough annual cost of living reviews. The reviews will look at the overall cost of energy to consumers, not just the incremental costs arising from AP2, and will guide the ACT Government's consideration of AP2's staged implementation.

The ACT Government also recognises that while some measures may have only a marginal impact on energy costs for the community as a whole, its effects might be much greater for those with lower incomes or those experiencing difficult financial circumstances. The annual cost of living reviews will draw out these potential differences through a specific focus on social equity.

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<sup>1</sup> IPCC (2007) *IPCC Fourth Assessment Report: Climate Change 2007 (AR4)*, BOM (2012) *State of the Climate 2012: Australia continues to warm*



An integrated policy approach has been taken to developing actions in AP2. The actions identified address multiple outcomes, for example reducing greenhouse gas emissions and supporting a fair and low carbon economy. AP2 proposes the adoption of a broad range of strategies to achieve these outcomes. Importantly, AP2 relies on least-cost strategies being fully utilised before more costly strategies are implemented. AP2 adopts a sectoral approach to identifying and targeting emission reductions across the ACT community and this is reflected in its structure. These sectors relate to the major sources of emissions from our community.

## Meeting our 2020 targets

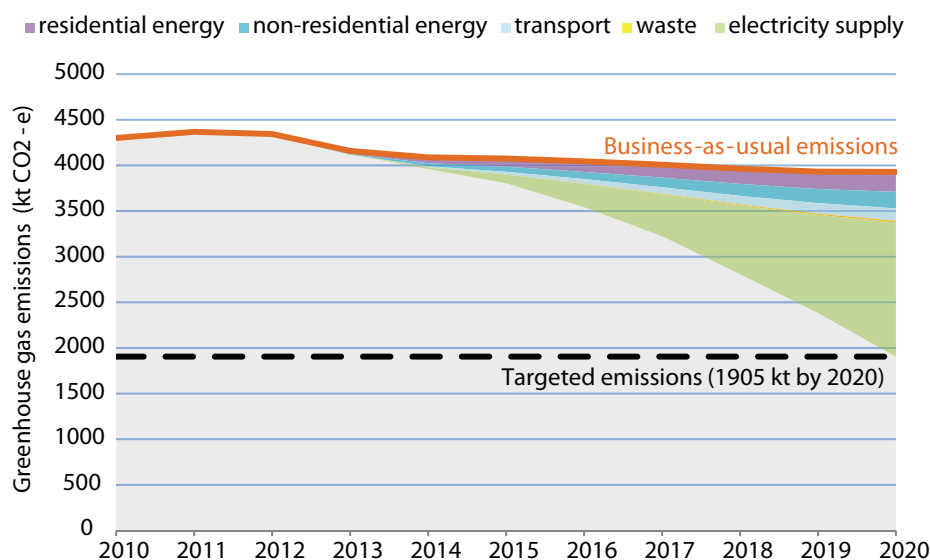
The ACT Government has developed a sectoral approach to identifying and targeting emission reductions across the ACT community and this is reflected in the structure of AP2. These sectors relate to the major sources of emissions from our community:

- residential sector energy use
- non-residential sector energy use
- transport sector emissions
- waste sector emissions, and
- energy supply sector emissions.

Executive summary figure 1 and executive summary table 1 show the potential contribution each sector can make to achieving our 2020 emission reductions target. This show that in 2020 around 553,000 tonnes CO<sub>2</sub>-e savings will be targeted through electricity, gas and transport fuel savings, and through reductions in emissions from the Territory's landfill sites.

The remaining reductions (the large green wedge) can be, subject to ongoing policy review, achieved through changing the generation mix of electricity supplied to the Territory. Specifically, AP2 proposes that by 2020 the Territory will develop around 690 megawatts of large-scale renewable energy capacity delivering around 1,900 gigawatt hours of emissions-free electricity per annum.

### Executive summary figure 1: Potential contribution of sectors to meeting our 2020 greenhouse gas reduction targets







## Executive summary table 1: targeted emission reductions by sector

Sector	Actions	Emissions reduction in 2020 (tonnes CO <sub>2</sub> -e)
Residential sector energy use	6	218,000
Non-residential sector energy use	3	181,000
Transport sector emissions	1	138,000
Waste sector emissions	1	16,000
Energy supply sector emissions	3	1,471,000
Climate Change adaptation	3	N/A
Monitoring and reporting	1	N/A
<b>Total</b>	<b>18</b>	<b>2,024,000</b>

The approach taken under AP2 is based on 'Pathway 2' of the draft AP2 which was overwhelmingly supported through the community consultation. It will set out and see the Territory become a national leader in renewable energy investment and transform Canberra, and the Australian Capital Region, into a hub of clean energy innovation and investment. AP2 provides for a staged investment in renewable energy and energy efficiency allowing for flexibility to respond to reductions in technology costs as they emerge.

Carbon offsets have not been included in the AP2 pathway and have been identified only as a measure of last resort. However, this decision will be revisited subject to national and international policy developments along the way to 2020 and will be the subject of independent reviews of AP2. The role of fossil fuel generation from the National Electricity Market is recognised as a transitional and reserve power source to 2020.

Savings are the result of improvements in household energy efficiency, while costs result from renewable energy investments. Combining the two, net savings are expected to result from the pathway set out in AP2 at around \$30 per household to from 2013 to 2017. Net costs are estimated to grow from around zero in 2018 peaking at around \$60 per household in 2020 before again declining. It is important to note that costs of transport fuel savings are not included in this net savings calculation amount due to some uncertainty around the allocation of these costs to households. However, on the basis of conservative estimates, these may more than offset net cost to households arising from potential renewable energy investments.

Pathway 2 has the following advantages over the other options considered:

- energy efficiency greatly reduces costs
- while there is a cost premium in the short term associated with investment in renewable energy, these reduce over time and it is predictable
- lower exposure to volatile carbon offset markets
- policies to support renewable energy investments can be designed to ensure emission reductions above and beyond national pollution caps
- renewable energy investments in the ACT and region offer regional development and employment opportunities
- it provides a basis for long-term targets in 2050 and 2060.

A portfolio approach is proposed for investment in renewable energy with local renewable energy generation sources developed, before looking to the region for supplementary energy generation sources.



AP2 is based on a priority order for activities, from local to global, while recognising our place in our region. In the first instance the ACT will look at local options for renewable and low-carbon energy generation. If local projects are not feasible then the barriers to why they are not an option will be explored with a view to eliminating barriers. Prioritising local action will increase local capacity for reducing emissions over time. For example future renewable energy initiatives will need to be examined for their ability to capture investment within the Territory, to support local infrastructure and employment.

## Achieving additional emission reductions

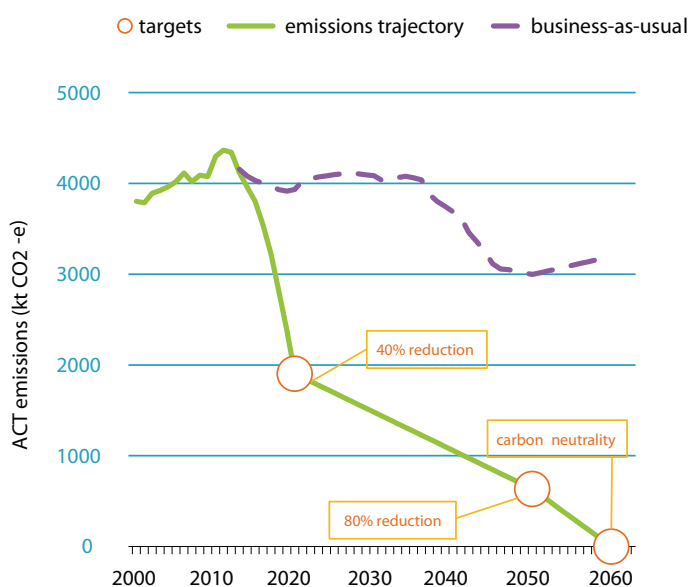
Investment in renewable energy under AP2 will be counted as a ‘recognised voluntary action’ under the Australian Government Clean Energy Future plan. This will ensure that emission reductions made by Canberrans are above and beyond national pollution caps.

Where actions do not achieve additional greenhouse gas reduction, the ACT Government will ensure they are complementary to a price on carbon, such as the support for cost-effective energy saving measures.

## Progress towards carbon neutrality in 2060

While the achievement of our 2020 greenhouse gas reduction target will set the Territory well on the way to achieving our target of carbon neutrality by 2060, the pathway from 2020 to 2060 is inherently uncertain. Technology can be expected to rapidly evolve over that time, creating opportunities for greater cost-effective investment in energy efficiency and local renewable energy generation. In the transport sector, fuel efficient and electric vehicles can be expected to greatly increase their market share driven by rapid advances in battery storage technology. National pollution caps will strengthen in line with international agreements and this will enhance the cost-effectiveness of carbon mitigation across our economy.

**Executive summary figure 2: ACT emissions trajectory, business as usual and targets**





The Territory's Planning Strategy will also play a key role in reducing our emissions as well as helping us adapt to a changing climate. Continuing to invest in good shade trees in our streets provides shade and shelter for houses and reduces the need to turn on air conditioners. A more compact urban form will reduce trip times and encourage cycling, walking and sustainable public transport.

Beyond 2020 we can also expect to see improvements in the cost-competitiveness of renewable sources of gas, such as syngas from the combustion of biomass and the production of methane from hydrogen. While these developments will provide a basis for ongoing reductions in emissions to achieve our objective of carbon neutrality in 2060, support for the development of new technologies in this area are beyond the scope AP2. The Territory will need to closely monitor trends and developments as we approach 2020.

## Adapting to a changing climate

AP2 includes a strong focus on adaptation to climate impacts already being experienced, and that will accelerate over the course of this century.

Climate change is expected to affect our region by making it drier and hotter. Climate change is likely to result in lower than average, less evenly distributed and less predictable rainfall, meaning drier overall conditions but also increased flash flooding. These changes have far-reaching implications for water security, planning, nature conservation, disaster management and human health, that need to be addressed through practical evidence-based policy.

AP2 brings together the range of new and existing strategies, developed by the Territory to ensure we safeguard our wellbeing and prosperity, and protect our natural environment, as our climate changes.

## Monitoring, reporting and future decision-making

AP2 commits the ACT Government to high levels of transparency and accountability through a new public reporting framework. Specifically, the government will work towards:

- more comprehensive online data reporting with at least 90% of emissions reported within six months of the end of each reporting year
- real-time, or near real time, reporting of Territory electricity and gas consumption and renewable energy generation at the Territory or network area level to support enhanced community engagement
- reporting of major indirect emissions including air-travel, and
- more detailed reporting on fugitive emissions from industry and other sources.

Progress on implementing AP2 will be subject to independent assessment and reporting by the Office of the Commissioner for Sustainability and the Environment (OCSE) through the publication of Implementation Status Reports (ISR) every three years from 2014 to 2020. Each ISR will assess performance against the achievement of AP2 outcomes.

The ACT Government will table a response to each ISR report within 12 months of its publication as a Minister's annual report under the *Climate Change and Greenhouse Gas Reduction Act 2010*. Executive Summary Figure 3 sets out reporting timeframes out to 2020, leading to the publication of Action Plan 3 in 2021.

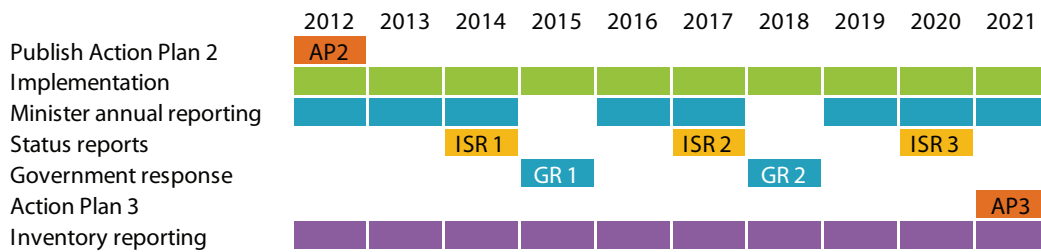
The ACT Government Response will allow an opportunity for the government to update and revise AP2 every three years. The government's response will include any updates to the existing strategy and actions and list any new actions going forward; this will allow the document to remain current and up to date with the latest science and technology.



Actions proposed under AP2 will be subject to regulatory impact assessments, implementation and risk planning, and normal budget processes as appropriate.

An assessment of potential social equity and cost of living impacts will be completed each year and reported to the Assembly as part of annual reporting under the *Climate Change and Greenhouse Gas Reduction Act 2010*.

**Executive summary figure 3: Independent and government reporting timeframes under AP2 (calendar years)**





## SUMMARY OF ACTIONS

AP2 sets out a strategic pathway with options for incremental implementation, subject to annual reviews and the Government's budget process. The ACT Government is mindful that some measures proposed as part of this strategy may impact the cost of energy for the community. For that reason, implementation at each step of the way will be subject to thorough annual cost of living reviews. The reviews will look at the overall cost of energy to consumers, not just the incremental costs arising from AP2, and will guide the ACT Government's consideration of AP2's staged implementation. The annual cost of living reviews will have a specific focus on social equity

### Reducing residential sector emissions

*Six actions Emissions reduction in 2020 (tonnes CO<sub>2</sub>-e): 218,000*

#### **Action 1**

The ACT Government's Energy Efficiency Improvement Scheme will commence from 1 January 2013 requiring retailers to implement energy efficiency improvements to ACT homes with a focus on low-income households. The Scheme will be extended to 2020 subject to outcomes of the scheme review in 2014 regulatory impact assessment and developments at the national level.

#### **Action 2**

Subject to a regulatory impact assessment, the ACT Government will introduce legislation to restrict the replacement and installation of high-emission water heaters in houses and townhouses in gas reticulated areas and will investigate the expansion of emissions standards for hot water heaters to all new residential buildings by June 2014, with a view to introduce new standards in the 2015 revisions of the ACT building code if found to be cost effective.

#### **Action 3**

Subject to a regulatory impact assessment, the ACT Government will introduce legislation to require landlords to provide information to tenants on the energy efficiency of homes and fixed appliances and major energy uses. Regulatory impact assessment and stakeholder consultation will be completed in 2013.

#### **Action 4**

The ACT Government will publish by 2015 a Pathway to Zero Emissions Buildings policy informed by a regulatory impact assessment and stakeholder consultation to be undertaken from 2013 covering residential and non-residential building types.

#### **Action 5**

The ACT Government will continue to build on the experience of its successful ACTSmart programs to develop a comprehensive strategy to engage the community on climate change matters and to provide integrated information, advice and support to Canberra households on reducing energy bills and cutting emissions. This will be guided by a community engagement strategy to be published in early 2013.

#### **Action 6**

The ACT Government will conduct a trial of advanced energy technology systems, in partnership with the Australian National University and the Canberra Institute of Technology aimed at increasing the technical and economic potential for intermittent energy sources on the ACT network.



## Reducing non-residential sector emissions

*Three actions Emissions reduction in 2020 (tonnes CO<sub>2</sub>-e): 181,000*

### **Action 7**

The ACT Government will complete a regulatory impact assessment by the end of 2012 considering the impacts and opportunities for extending the Energy Efficiency Improvement Scheme to include fuller business participation.

### **Action 8**

The ACT Government will establish ACTSmart Energy Advice to provide up-to-date practical advice and support to small and medium sized businesses, community groups and representative organisations.

### **Action 9**

The ACT Government will survey buildings in major commercial districts to develop a map of heating and cooling loads across the Territory to facilitate private investment in low-carbon energy networks. The Government will look for opportunities to streamline regulatory processes through its review of the *Utilities Act 2000*.

## Reducing transport sector emissions

*One action Emissions reduction in 2020 (tonnes CO<sub>2</sub>-e): 138,000*

### **Action 10**

The ACT Government will implement the Transport for Canberra policy, and develop a Low Emissions Vehicle Strategy.

## Reducing waste sector emissions

*One action Emissions reduction in 2020 (tonnes CO<sub>2</sub>-e): 16,000*

### **Action 11**

The ACT Government will implement the ACT Waste Management Strategy 2011–2025 and achieve a carbon neutral waste sector by 2020.



## Transitioning to large-scale renewable energy

*Three actions Emissions reduction in 2020 (tonnes CO<sub>2</sub>-e): 1,471,000*

### **Action 12**

The ACT Government will, subject to an evaluation of the 40 megawatt solar auction and ongoing policy review, develop large-scale renewable energy generation capacity for the purposes of reducing emissions from electricity use and achieving our 2020 emissions reduction targets.

### **Action 13**

The ACT Government will determine a new renewable electricity consumption target of 90% renewables by 2020 and in 2013 publish a methodology for accounting for renewable energy consumption and reporting against this target.

### **Action 14**

The ACT Government will develop detailed mapping of the ACT electricity distribution network providing up-to-date information on the capacity of feeders and substations to absorb additional renewable energy generation.

## Adapting to a changing climate

*Three actions Emissions reduction in 2020 (tonnes CO<sub>2</sub>-e): N/A*

### **Action 15**

The ACT Government will assess the potential risks of climate change to community health, territory life and property including through acute weather and fire impacts in the ACT and the surrounding region through a new Territory Wide Risk Assessment and will integrate this knowledge into future health system planning and natural disaster and emergency risk management and planning.

### **Action 16**

By the end of 2013 the ACT Government will publish a Ministerial Statement on how, from a whole-of-government perspective, built environment and urban open spaces will be developed to respond to climate change and the ACT's long term mitigation objectives. This will incorporate a review of the Territory Plan development codes and design standards.

### **Action 17**

The ACT Government will continue to assess the potential impacts of climate change on ecological systems in the ACT and the surrounding region and integrate this knowledge into environmental management and development planning decisions to ensure our natural environment is conserved and enhanced.



## Monitoring, reporting and future decision-making

*One action Emissions reduction in 2020 (tonnes CO<sub>2</sub>-e): N/A*

### **Action 18**

The ACT Government will respond to implementation Status Reports on AP2 published in 2014, 2017 and 2020 that will set out progress against actions and targets and move to more timely and transparent greenhouse gas inventory reporting. An assessment of potential social equity impacts will be completed each year and reported to the Assembly as part of annual reporting under the *Climate Change and Greenhouse Gas Reduction Act 2010*. Each measure introduced as part of AP2 will be subject to a cost of living assessment. The assessments will look at the overall increases in cost of energy to consumers and will guide the ACT Government's consideration of the pace of AP2's staged implementation.



# 1.

## INTRODUCTION





## The purpose of AP2

AP2 is a second Action Plan and update to the Territory's 2007 Climate Change Strategy: *Weathering the Change*. It provides a pathway to achieve the Territory's legislated 2020 greenhouse gas reduction targets, and a set of actions to progress the strategy to its next review point in 2015.

The purpose of AP2 is to support the community's vision that by 2060 the ACT will be a sustainable and carbon neutral city that is adapting to a changing climate. This vision will be realised through the achievement of the following outcomes in the ACT:

1. reduced greenhouse gas emissions
2. a fair society in a low carbon economy
3. adapting to a changing climate, and
4. leading a sustainable future.

The primary focus of AP2 is to set the Territory on the path to meet our greenhouse gas reduction target of a 40% reduction on 1990 levels by 2020. Achieving this target will establish a strong foundation for the achievement of the Territory's vision for 2060.

An integrated policy approach has been taken to developing actions in AP2 where lowest cost actions are pursued first and local investment is prioritised. The actions identified address multiple outcomes, for example reducing greenhouse gas emissions and supporting a fair and low carbon economy. AP2 adopts a sectoral approach to identifying and targeting emission reductions across the ACT community and this is reflected in its structure. These sectors relate to the major sources of emissions from our community.

## The greenhouse effect and climate change

Scientific evidence tells us that increasing levels of greenhouse gases in the earth's atmosphere are having a profound effect on our climate and oceans and the earth's ecological systems.

The greenhouse effect is a natural process whereby greenhouse gases, such as carbon dioxide and methane, in the earth's atmosphere trap heat and provide a relatively stable temperature range and a hospitable environment for life. Increased concentrations of greenhouse gases in the atmosphere, such as through the burning of fossil fuels, results in additional heat being captured, with complex and wide-ranging effects. This is sometimes referred to as global warming, or anthropogenic climate change.

Global carbon dioxide, methane, and nitrous oxide concentrations have risen rapidly during the past two centuries. The concentrations of greenhouse gases in the atmosphere reached a new high in 2011. The concentration of carbon dioxide, at 390 parts per million (ppm), is much higher than the natural range of 170 to 300 ppm over the past 800,000 years.<sup>2</sup>

The Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, released in 2007, found that the average global surface temperature is expected to increase between 1.8 and 4°C by the end of the century.<sup>3</sup> Australian average temperatures are projected to rise by 1.0 to 5.0 °C by 2070.<sup>4</sup>

The international scientific community tells us that in order to avoid the most catastrophic effects of climate change, the increase in average global temperature must not exceed 2°C. To achieve this, global greenhouse gas emissions must be reduced by at least 80% below 1990 levels by 2050. For industrialised countries, the main producers of greenhouse gas emissions, the proposed target is 40% by 2020.

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<sup>2</sup> IPCC (2007) *IPCC Fourth Assessment Report: Climate Change 2007 (AR4)*.

<sup>3</sup> IPCC (2007) *IPCC Fourth Assessment Report: Climate Change 2007 (AR4)*.

<sup>4</sup> BOM (2012) *State of the Climate 2012: Australia continues to warm*.



An increase of greater than 2°C in average global temperatures is expected to cause dramatic and, in some cases, long term changes such as accelerating the melting of the Greenland ice cap with associated sea level rises. As the area covered by land and sea-ice diminishes, heat ordinarily reflected by snow would in turn be absorbed, further amplifying changes to our climate. The latest observations confirm that global-average mean sea-level rise since 1990 is near the high end of projections in the IPCC's Fourth Assessment Report.<sup>5</sup>

The ACT is expected to experience the following climatic changes:

- reduced rainfall and runoff.
- increase in temperatures and a greater number of extreme hot days (days over 35°C).
- increase in risk of bushfires due to increased temperature and evaporation.
- increase in number of illnesses and heat related deaths, with the elderly particularly vulnerable.
- increase of food-borne infectious diseases, air pollution and mental health consequences.
- changes in water availability, temperatures, bushfires and changes to the distribution of pest species will impact on natural environments.
- projected changes could directly affect the productivity of the region's agricultural industries.

Source: Department of Climate Change and Energy Efficiency (2011) *Climate Change – potential impacts and costs. Australian Capital Territory (ACT)*

Climate change is expected to affect our region by making it drier and hotter. Climate change is likely to result in lower than average, less evenly distributed and less predictable rainfall, meaning drier overall conditions but also increase flash flooding.

The impacts of climate change on biodiversity are expected to be serious, even with only a small increase in average temperature (1°C or 2°C). Species with restricted climatic ranges, small populations and limited ability to migrate are most likely to suffer dramatic declines or local extinction as suitable habitat disappears in the ACT. Availability of water will also be a major determining factor in the persistence and distribution of species across the landscape.

Climate change projections indicate that there are likely to be significant impacts on public health in the ACT. Potential adverse effects on population health will arise from direct impacts, such as heat stress during heatwaves and sunburn, and indirect impacts, such as increased allergic symptoms, and impacts of natural disasters and extreme weather events including food and waterborne diseases, deaths, injuries, mental trauma, and population displacement.<sup>6</sup>

These changes in climatic patterns pose substantial risks to agriculture, water security, natural systems and the Australian economy. They emphasise the need to increase resilience across our society and enhance our capacity to adapt to both floods and long dry periods. Ultimately, to avoid changes in the climate system to which we cannot adapt, we need to do our part along with other countries to drive rapid and deep reductions in the emission of greenhouse gases.

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5 IPCC (2007) *IPCC Fourth Assessment Report: Climate Change 2007 (AR4)*.

6 Climate Commission (2011) *The Critical Decade: Climate Change and Health*.



## Greenhouse gas emissions in the ACT

The ACT Greenhouse Gas Inventory is our most comprehensive account of greenhouse gas emissions in the ACT. It has a broader scope than that given in the state and territory Greenhouse Gas Inventories prepared by the Commonwealth Department of Climate Change and Energy Efficiency (DCCEE). The DCCEE inventory for the ACT calculates emissions using a production approach which includes only the specific facility or production process where emissions occur (scope 1 emissions). The ACT has adopted a position of also assuming additional responsibility for the greenhouse gas emissions created in the production of the electricity that is supplied to the ACT from the National Electricity Market (scope 2 emissions).

**Scope 1.** Scope 1 emissions include the combustion of fuels (e.g. boilers, furnaces, turbines) including from our vehicle fleet, or the direct release of greenhouse gases such as some refrigerants or landfill gases.

**Scope 2:** Indirect emissions that result from the generation of the electricity supplied to the ACT from the National Electricity Market.

**Scope 3:** All indirect emissions other than those covered by scope 2, such as emissions from the supply of goods and services to the ACT. Scope 3 emissions are not counted in the ACT's Greenhouse Gas Inventory.

In summary, ACT greenhouse gas emissions are dominated by emissions from stationary energy (electricity and gas) used in the residential and commercial sectors, and petroleum fuels used in transport. Electricity comprises 63% of ACT emissions - the largest single source. Transport (22%) represents the second largest source of emissions, followed by natural gas (8%). Unlike the other states and territories, the ACT has few emissions from the agriculture and industrial sectors.

### Financial versus calendar years

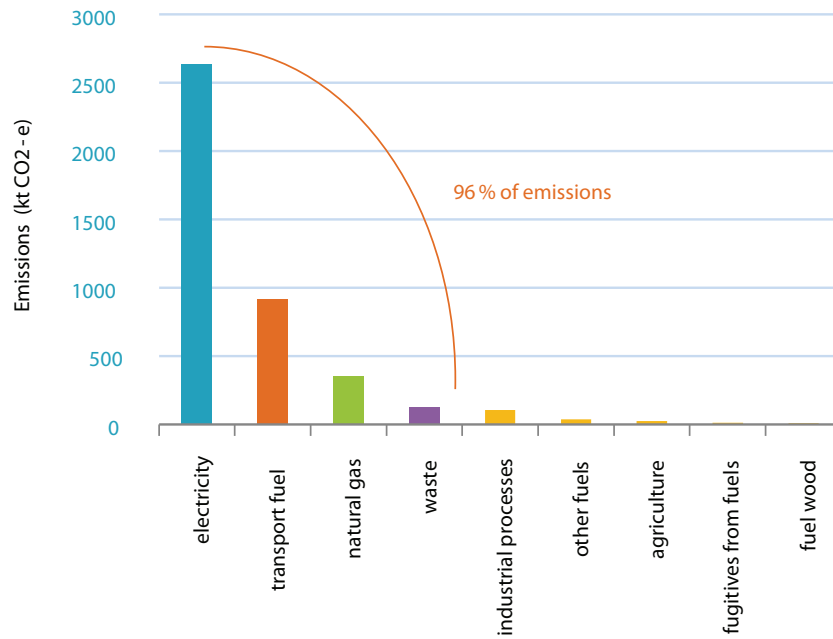
The ACT's greenhouse gas inventory is reported in financial years, with the latest being for 2008-09. For presentation purposes AP2 uses '2009' to refer to the 2008-09 financial year. All targets and modelled results are reported in financial years unless otherwise indicated.

The ACT's total emissions have trended upward since 1990. There has been a 31.7% increase in total emissions including emissions associated with land use, land use change and forestry (LULUCF) from 1990 to 2009, which corresponds to emissions growing at an average annual rate of 1.38%.

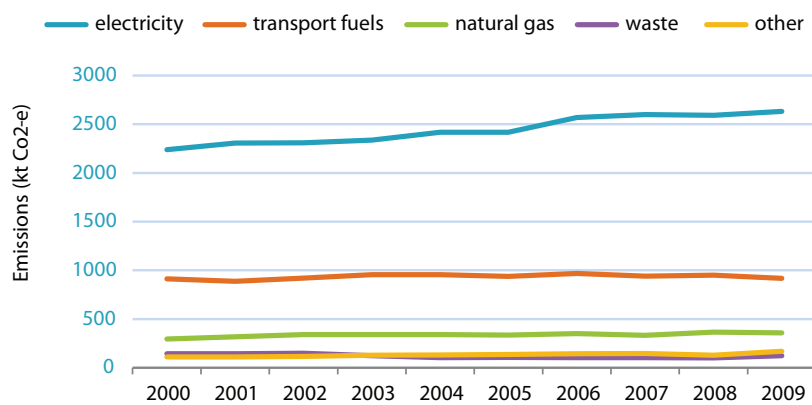
A comparison of the trend in total emissions from 1990 with the trend in the main sectors responsible for emissions reveals that while emissions attributable to electricity consumption is the largest share of annual total emissions, it has also made the largest contribution to the increase in the ACT's total emissions, increasing at an average annual rate of 1.4%. Since the mid 1990s emissions from transport fuels have remained relatively stable, while emissions from natural gas have increased (along with those from 'other sources' to a lesser extent), and waste emissions have decreased.



**Figure 1: ACT 2009 emissions by sector (excluding LULUCF)**



**Figure 2: ACT emissions by sector (excluding LULUCF) 2000 to 2009**



Source: ICRC (2011) ACT Greenhouse Gas Inventory report for 2008-09.



## ACT legislated greenhouse gas reduction target

In November 2010, the ACT Government passed the *Climate Change and Greenhouse Gas Reduction Act 2010*, which established emissions reduction targets of:

- zero net greenhouse gas emissions by 2060
- peaking per person greenhouse gas emissions by 2013
- 40% below 1990 levels by 2020, and
- 80% below 1990 levels by 2050.

The achievement of our greenhouse gas reduction targets would constitute a major turnaround in the Territory's emissions which have been steadily growing since the Territory's formation.

These targets were informed by the Legislative Inquiry into Greenhouse Gas Reduction Targets which involved extensive consultation with the ACT community and they are consistent with estimates by climate scientists of what needs to be achieved by industrialised countries to limit global warming to 2°C. These are also consistent with commitments of other leading cities around the world which are also committed to taking strong action to reduce emissions.

**Table 2: Commitments of world cities to reducing emissions**

City	Base year	Reduction target	Target year
Canberra, Australia (1)	1990	40%	2020
Canberra, Australia (2)	1990	Neutrality	2060
Chicago, USA	1990	25%	2020
Los Angeles, USA	1990	35%	2030
London, UK	1990	60%	2025
Copenhagen, Denmark (1)	2005	20%	2015
Copenhagen, Denmark (2)	2005	Neutrality	2025
Vancouver, Canada	2007	33%	2020
Rotterdam, the Netherlands	1990	50%	2025
Wellington, New Zealand	2001	30%	2020

## National and international action

The ACT is taking action in an uncertain international policy environment. The first commitment period of the Kyoto Protocol ends on 31 December 2012. At the 17th Conference of the Parties, held in Durban in December 2011, Parties to the United Nations Framework Convention on Climate Change agreed to adopt a universal legal agreement on climate change as soon as possible, but no later than 2015.

Despite current uncertainty around a binding international agreement, there is strong international consensus on the need to take action to stabilise global atmospheric greenhouse gases and many nations are implementing effective policies.

From 2013 there will be more than 50 national or sub-national emission trading schemes in place worldwide. These schemes will cover a combined population of more than 850 million people and will account for around 30% of the global economy.



Thirty-three countries will have national emissions trading schemes by 2013: Australia, New Zealand, Switzerland, the European Union's 27 member countries, Norway, Iceland and Liechtenstein. A range of countries are currently developing their own emissions trading schemes at the national or sub-nation level including: Brazil, Turkey, Chile, South Africa and Mexico. By 2015 all but one of the Organisation for Economic Co-operation and Development's (OECD) 34 member countries are expected to be pricing carbon through emission trading schemes.<sup>7</sup>

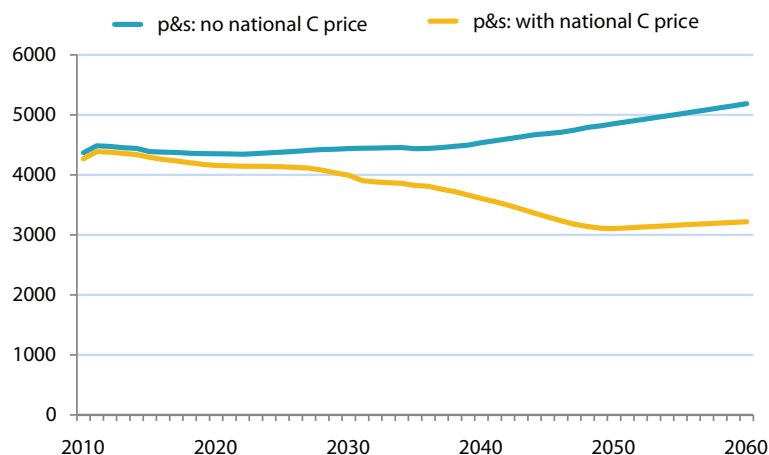
The Australian Government has committed to reducing national emissions by 5% compared to 2000 levels by 2020 in the absence of a binding international agreement. In order to achieve this national goal the Australian Government passed the Clean Energy Legislative Package and associated legislation in November 2011. The *Clean Energy Act 2011 (Cwlth)* which commenced on 2 April 2012 is the central piece of the legislation package and establishes the carbon pricing mechanism along with assistance for emissions-intensive trade-exposed industries and the coal-fired electricity generation sector.

The legislation includes the establishment of a carbon price which commenced on 1 July 2012. The carbon price will be fixed for the first three years, starting at \$23 per tonne of CO<sub>2</sub>-e and rising at 2.5% a year in real terms.

The ACT Government recognises that a cap and trade emissions trading scheme, with a flexible price is the most economically efficient means of reducing Australia's emissions. From 2015 the carbon price will be determined by the market. For the first three years of the flexible price period, a price ceiling and a price floor will apply. The carbon price is expected to cover around 500 of Australia's largest polluters, accounting for around 60% of Australia's national emissions.

The impact of the Australian Government's proposed carbon price mechanism on the Territory's emissions has been estimated by pitt&sherry and is illustrated in Figure 3 along with the 2020 and 2060 targets.

**Figure 3: Estimated effect of a carbon price on ACT emission projections**



Source: pitt&sherry (2011) *Weathering the Change The ACT's Draft Climate Change AP2: An analysis of pathways, costs and benefits*. (Note this assumes current national caps are maintained at 2020 levels and not reduced further as part of a global agreement).

<sup>7</sup> DCCEE (2012) Carbon pricing widespread in advanced economies.



The implementation of a national carbon price will make an important contribution towards meeting the ACT's greenhouse gas reduction targets. This will happen in two ways. First, the carbon price is expected to lower the emissions intensity in the National Electricity Market, so each unit of electricity consumed in the ACT will, over time, lead to fewer greenhouse gas emissions. Second, a carbon price will change the relative prices for emissions-intensive goods and will provide businesses and households with incentives to choose low-emission technologies and to use energy and other resources more efficiently.

### **Compensation under a national price on carbon**

On 8 November 2011, the Australian Parliament passed laws to put a price on carbon pollution. Australia will have a price on carbon from 1 July 2012 through a cap-and-trade emissions trading scheme.

The price on carbon is designed to trigger the transformation of the Australian economy and create incentives to reduce pollution and investment in clean energy. Around 500 of the biggest polluters in Australia will pay for the pollution they emit, under a carbon pricing mechanism.

Commonwealth Treasury modelling indicates that average Australian weekly household spending will go up around \$9.90 as a result of the carbon price, including \$3.30 a week on the average electricity bill and \$1.50 a week on the average gas bill.

Around 8 million households are estimated to receive compensating assistance through tax cuts, payment increases or both. Assistance will focus particularly on pensioners and low-and middle-income households.

There are two ways that households will receive assistance:

- increases in pensions, allowances and family payments, and
- income tax cuts.

The assistance will mean:

- pensioners and self-funded retirees will get up to \$338 extra per year if they are single and up to \$510 per year for couples, combined
- families receiving Family Tax Benefit Part A will get up to an extra \$110 per child
- eligible families will get up to an extra \$69 in Family Tax Benefit Part B
- allowance recipients will get up to \$218 extra per year for singles, \$234 per year for single parents and \$390 per year for couples combined
- taxpayers with annual income of under \$80,000 will all get a tax cut, with most receiving at least \$300 per year

Further detail on the national carbon price and clean energy futures package can be found online at [www.cleanenergyfuture.gov.au](http://www.cleanenergyfuture.gov.au)

The underlying premise of carbon pricing is to ensure that individually and as a society we account for the environmental impacts of our carbon emissions and have the incentive to reduce those emissions. However, the ACT will also need to implement a range of measures in excess of the national carbon price in order to achieve its own legislated targets.

The Commonwealth's Clean Energy Future package includes a number of complementary measures to support the efficient use of energy and the move to renewable energy sources.





## **Support for a transition to a clean energy future - Commonwealth complementary measures**

### ***Support for innovation***

- Clean Energy Finance Corporation
- Australian Renewable Energy Agency

### ***Industry and business assistance***

- increased small business instant asset write-off threshold
- grants to provide energy efficiency information to small and medium businesses and community organisations
- Clean Technology Program
- Clean Energy Skills Program
- Clean Technology Focus for Supply Chains Programs

### ***Household and community assistance***

- low carbon communities
- household advice line / website
- Remote Indigenous Energy Program
- household energy survey

### ***Additional energy efficiency measures***

- further work on a national Energy Savings Initiative
- continuation and expansion of Energy Efficiency Opportunities

### ***Transport measures***

- mandatory vehicle emissions standards

### ***Regional structural adjustment assistance***

- regional structural adjustment assistance

### ***Land sector measures***

- Carbon Farming Initiative (CFI) non-Kyoto carbon fund
- Carbon Farming Futures
- Biodiversity Fund
- Regional Natural Resources Management (NRM) Planning and Climate Change Fund
- Indigenous Carbon Farming Fund
- Carbon Farming Skills
- Land Sector Carbon and Biodiversity Board
- native forest wood waste under the Renewable Energy Target

Further detail on Commonwealth complementary measures can be found online at:  
[www.cleanenergyfuture.gov.au/clean-energy-future/securing-a-clean-energy-future/appendix-b/](http://www.cleanenergyfuture.gov.au/clean-energy-future/securing-a-clean-energy-future/appendix-b/).



## Creating additional emission reductions

Investment in renewable energy under AP2 will be counted as a 'recognised voluntary action' under the Australian Government Clean Energy Future plan. This will ensure that emissions reductions made by Canberrans are above and beyond national pollution caps. Where actions do not achieve additional greenhouse gas reductions, the ACT Government will ensure that they are complementary to a price on carbon.

## Learning from Action Plan 1

*Weathering the Change: Action Plan 1* was the ACT's first package of measures to address climate change in the ACT. Action Plan 1 set an ambitious series of actions to not only reduce emissions, but also increase awareness and knowledge of climate change. Action Plan 1 contained 43 actions set out against four key outcomes:

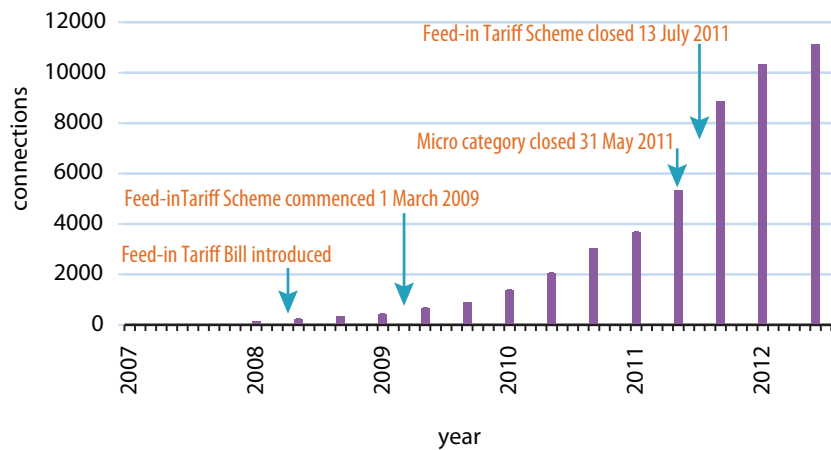
- being smarter in our use of resources
- designing and planning our city to be more sustainable
- adapting to current and future climate change and
- improving our understanding of climate change.

Some of the highlights of Action Plan 1 included a commitment to:

- *Introduce a GreenPower first offer requirement (Action 5)*. The introduction of the first offer GreenPower scheme has coincided with a significant increase in GreenPower sales in the ACT.
- *Improve energy efficiency improvements in government housing (Action 8)*. The ACT Government committed \$8 million over four years from 2011/12 to increase the energy efficiency of public housing dwellings across Canberra and ease cost-of-living pressures for tenants. The increased funding doubles the support to improve the energy efficiency of public housing in the ACT. The funding is being used to retrofit dwellings and conduct upgrades to heating and hot water systems.
- *Assist schools become carbon neutral (Action 11)*. More than \$3.3 million has been invested installing solar panels at every ACT public school. The panels not only generate renewable energy, but they are a lesson to students about what they can do every day to reduce their impact on the environment. The panels and the software that helps students monitor the energy they generate are a part of the education system helping to ensure young Canberrans get the skills they need to ensure Canberra stays sustainable into the future.
- *Introduce a Feed-in Tariff Scheme (Action 18)*. ACT households, businesses and educational institutions have embraced renewable energy, installing more than 25 megawatts of solar over the last four years. The number of photovoltaic systems installed in the ACT has greatly increased with the introduction of the Feed-in Tariff scheme.



**Figure 4: Connections of rooftop solar photovoltaic systems in the ACT, 2007 to 2012**



AP2 has been developed to build on the successes and lessons learnt from Action Plan 1. A criticism of Action Plan 1 was that it was difficult to quantify the resulting greenhouse gas emission reductions. AP2 introduces a focus on meeting the emission reduction targets in the *Climate Change and Greenhouse Reduction Act 2010*.

An accurate, timely and transparent monitoring and reporting system will mean that AP2 will be able to demonstrate quantifiable emission reductions against each mitigation sector.

AP2 delivers a more coordinated, strategic approach to climate change adaptation as opposed to the more isolated adaptation actions established under Action Plan 1.

## Community consultation

*Weathering the Change: Draft Action Plan 2* was released for public consultation on 5 December 2011. This discussion paper presented the examples of five 'pathways' for meeting an emissions reduction target of 40% below 1990 levels by 2020 to stimulate community discussion around the range of options available. The consultation period closed on 2 March 2012.

### Mitigation pathways presented in draft Action Plan 2

The five example pathways (i.e. individual or mixes of greenhouse gas reduction strategies) outlined in draft AP2 for achieving the ACT's 2020 greenhouse gas targets were as follows:

1. renewable energy
2. energy efficiency in buildings, sustainable transport, sustainable waste and renewable energy
3. energy efficiency in buildings, sustainable transport, sustainable waste plus gas generated electricity and offsets as required
4. energy efficiency in buildings, sustainable transport, sustainable waste and offsets, and
5. carbon offsets.

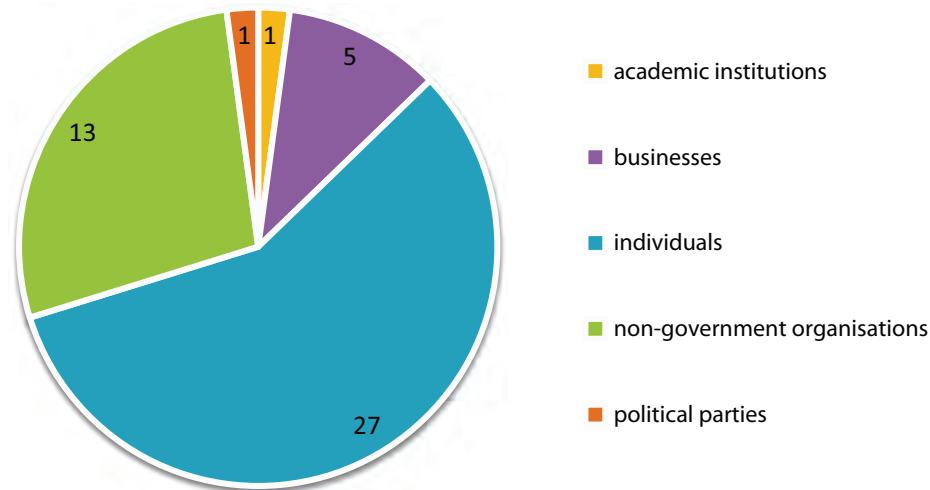


The consultation process was supplemented by the opportunity to provide written comments via the ACT Government's 'Time to Talk' website. Environment and Sustainable Development Directorate officers also engaged with industry, government and stakeholder groups at targeted briefings. Environment and Sustainable Development Directorate staff further engaged with the community at shopping centres in Dickson, Jamison and Erindale with the aim of providing information on the draft Action Plan and encouraging submissions and input.

Two community events, a World Café and a technical workshop were also held. More than 90 guests from stakeholder groups and the general public came together at the World Café event to discuss the pathways presented in Draft AP2. The technical workshop was an invitation only event, for more than 30 people, attended by those who had expressed interest in further consultation after the World Café event. This workshop focused on energy efficiency and energy supply.

A total of 46 formal written submissions were received. A summary of outcomes from consultations on *Draft Action Plan 2*, and written submissions, are available online ([www.environment.act.gov.au/climate\\_change](http://www.environment.act.gov.au/climate_change)).

**Figure 5: Source of submissions to Draft Action Plan 2**



### ACT Climate Change Council

The ACT Climate Change Council is an expert panel of ACT community members formed in October 2011 to provide advice to the Minister for Environment and Sustainable Development on reducing greenhouse gas emissions. Through the Council, the ACT Government has an expanded and ongoing opportunity to consult with the community. The Council reports to the Minister annually, and these reports are made available to the public. The Council has provided advice to the Minister on AP2 in a formal written submission.

The results of the consultation sessions and the written submissions received have been critical in informing and developing final AP2.

# 2.

## MEETING OUR 2020 EMISSION REDUCTIONS TARGET





## Choosing a pathway to 2020

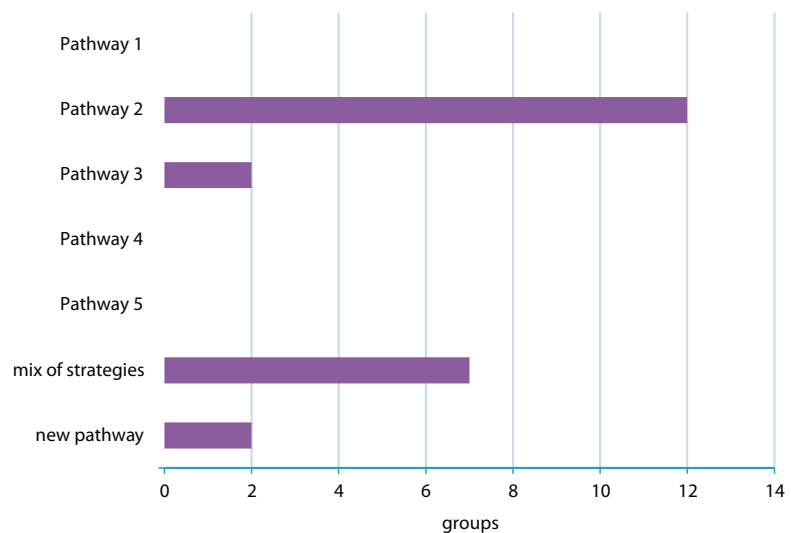
AP2 outlines a clear pathway, with a series of concrete policy actions, for the Territory to start its journey to achieve its goal of reducing emissions to 40% below 1990 levels by 2020, and provides a foundation for the longer term objective of achieving carbon neutrality by 2060. While these targets are a challenge for our community, analysis undertaken for AP2 demonstrates that they are appropriate, achievable and affordable.

Public consultation on the draft AP2 demonstrated that these targets have very strong community support. Smart and effective action toward these targets will be a source of pride for all Canberrans as we fulfil our responsibility to act on climate change while building a stronger, more sustainable and more prosperous community.

During public consultation on the draft Action Plan, the community demonstrated a preference to undertake strong action locally while allowing flexibility for the ACT to manage its transformation to a carbon neutral city in a cost-effective manner, and expressed a clear preference on how our targets should be achieved – Pathway 2. Pathway 2 targets reductions in greenhouse gas emissions from energy efficiency in buildings, sustainable transport and sustainable waste, with the remaining reductions achieved through switching the ACT’s electricity supply to renewable energy. Pathway 2 involves adoption of a broad range of strategies to achieve the government’s greenhouse gas reduction targets and has the appeal of ensuring that least-cost strategies are fully utilised before more costly strategies are implemented.

**Figure 6 – Support for pathways during World Café consultation event.**

During the World Café community event, participants divided into small groups and were asked to review the five pathways presented in draft Action Plan 2 and select a preferred pathway. Pathway 2 was overwhelmingly supported, confirming separate government advice concerning the scientific, social and environmental merits of that Pathway.



Some responses also supported a hybrid strategy based on Pathway 2 but utilising gas as a transitional electricity generation and heating source while investing in renewable energy in the National Electricity Market. A number of submissions raised verifiable offsets as a last resort option for meeting emissions reduction targets.

Pathway 5, which relied solely on carbon offsets, was the least preferred option. Respondents saw this pathway as not encouraging behaviour change and lacking transparency. An improvement in global economic conditions (resulting in increased emissions) combined with further international commitments on global emissions reduction could, by 2020, drive up offset prices significantly beyond current low levels. A large number of respondents also expressed opposition to the development of large-scale gas generation in the ACT.



**Renewables versus gas power generation** – Through the consultation process, the community expressed opposition to the development of large-scale gas generation technology within the Territory with a preference for renewable energy power generation. While renewable energy was acknowledged as having technical limitations related to its intermittency and cost, many considered that the intermittency of solar and wind generation could be managed by gas generators in the broader National Electricity Market while these technical limitations were resolved.

**Carbon offsets** – There was a strong view expressed that either carbon offsets should not be relied on or used only as a last resort and then only accredited or verifiable offsets should be used. Any use of offsets will be in accordance with the ACT Government's *Carbon Offsets Policy*, set out in Appendix A.

Pathway 2 has the following advantages over the other options considered:

- energy efficiency greatly reduces costs
- while there is a cost premium in the short term associated with investment in renewable energy, this reduces over time and it is predictable
- lower exposure to volatile carbon offset markets
- policies to support renewable energy investments can be designed to ensure emission reductions above and beyond national pollution caps
- renewable energy investments in the ACT and region offer regional development and employment opportunities, and
- it provides a basis for long-term targets in 2050 and 2060.

## Business as usual emissions

A business as usual (BAU) emissions baseline represent the emissions that would occur if no further action (beyond that which already exists) was taken to reduce emissions.

The ACT's BAU emissions projection includes:

- a national price on carbon
- national energy efficiency schemes such Minimum Energy Performance Standards (MEPS)
- existing landfill gas generation and the construction of a commercial material recovery facility (commercial MRF)
- continued incremental improvements in housing and construction standards
- continued GreenPower purchases, and
- expected growth in small and medium-scale rooftop solar.

It does not include recent government policy initiatives that have already been developed in the context of AP2 including Transport for Canberra, the ACT's large-scale solar auction, the Energy Efficiency Improvement Scheme and the ACT Waste Management Strategy.

Modelling undertaken for AP2 assumes a carbon price trajectory roughly in line with that predicted through Commonwealth Treasury modelling. Should the national carbon price legislation be significantly amended the ACT will utilise the set review periods for AP2 to update the document and actions.

Modelling undertaken for AP2 indicated that the Territory's total emissions are expected to peak in 2011 under BAU conditions and reduce to around 4000 kilotonnes CO<sub>2</sub>-e in 2013, remaining at that level until 2020. Per capita emissions reduce by around 10% over the same period to around 9.7 tonnes per person per annum.



## Population and per capita emissions

The ACT is expected to have strong population growth to 2020 rising to around 410,000 people by 2020, an increase of 11% from current levels.<sup>8</sup>

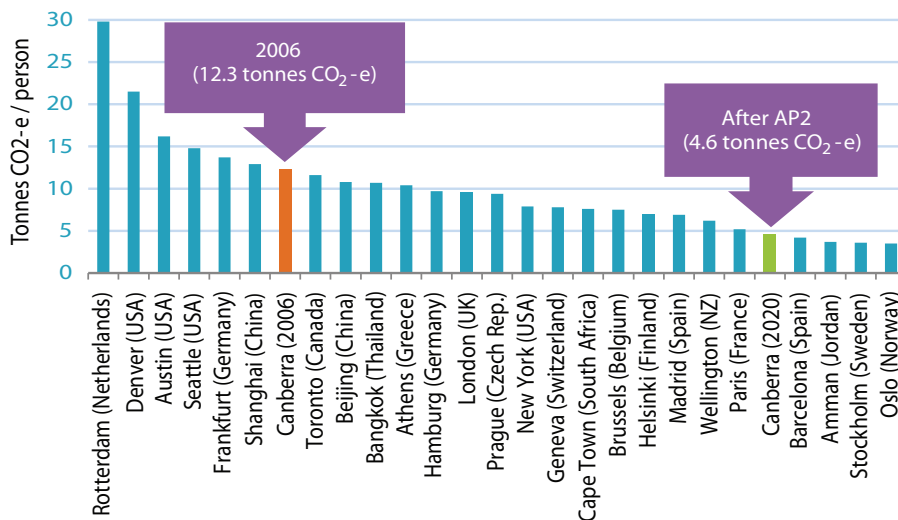
These forecasts are higher than modelled in Draft Action Plan 2 and this has increased the forecast electricity and gas consumption in the residential and commercial sectors. Transport sector projections have been based on trends, rather than population numbers and so these figures have not been affected.

Strong population growth will underpin the development of a vibrant community and prosperous economy in the Territory into the future. Analysis undertaken for AP2 shows that this growth need not be at the expense of the environment. It is possible to increase our population and reduce our emissions.

*The Climate Change and Greenhouse Gas Reduction Act 2010* establishes a target of peaking per capita emissions in 2013. Our most recent greenhouse gas inventory shows that per capita emissions peaked in 2006. The current downward trend is expected to continue under business as usual conditions, and be accelerated as a result of AP2.

However we still have a long way to go. AP2 is expected to reduce our per capita emissions to around 4.6 tonnes CO<sub>2</sub>-e in 2020, a reduction of 64% from 2006 levels.

**Figure 7: Per capita emissions for the ACT, before and after AP2, compared to selected world cities**



Sources: World Bank (2011) *Representative GHG Baselines for Cities and the Respective Countries* and Wellington City Council (2010) *Wellington City's 2010 Climate Action Plan*

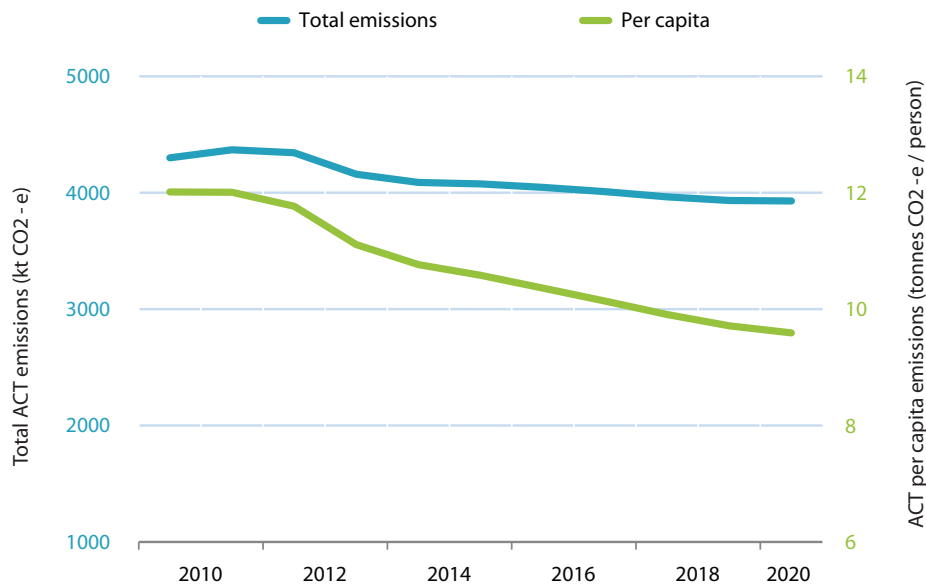
Figure 7 shows how Canberra ranked in 2006 against a range of world cities. While AP2 will reduce our per capita emissions relative to many cities, it is important to bear in mind that many of these cities are also taking strong action on climate change over this period.

<sup>8</sup> ACT Chief Minister's Department (2011) ACT Population Projections: 2009 to 2059



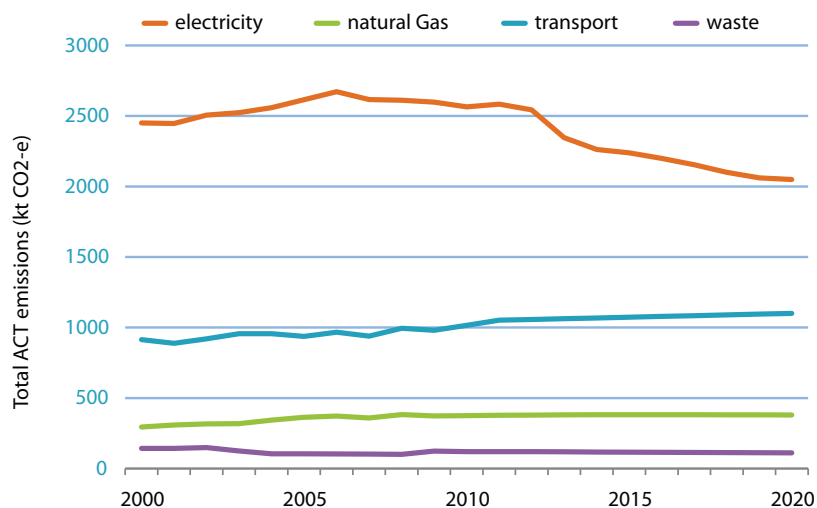


**Figure 8: Estimated BAU per capita and total emissions (2010 to 2020)**



The major reason for the reduction in per capita emissions under a BAU scenario is the national Large-scale Renewable Energy Target (LRET) scheme. When combined with a price on carbon, LRET is expected to result in changes in the mix of technologies used in power generation, including a shift to renewable and more efficient gas generation technologies. This means for every unit of electricity the Territory consumes, over time, fewer emissions are produced.

**Figure 9: Estimated BAU emissions for major emissions sources (2000 to 2020)**



While 2020 electricity emissions are expected to reduce from current levels, by 2020 electricity consumption is expected to increase by around 3% and 12% for the residential and non-residential sectors respectively. While residential gas use is expected to increase by 6%, non-residential gas use is expected to decrease by around 5%, primarily due to improved efficiency of commercial building heating equipment.



The government’s modelling indicates that, based on business as usual growth in energy usage, without a national price on carbon, emissions would be marginally higher in the short term and increase steadily after the national LRET is achieved in 2020 (see Figure 3 on page 7).

Transport emissions are also forecast to grow to 2020. The Territory’s fuel sales data indicates that transport emissions growth has not been as high as previously forecast. This has resulted in long term emissions projections being downgraded from Draft Action Plan 2.

## Progress to date

The ACT is working on a number of fronts to reduce greenhouse gas emissions and the impact of rising energy prices.

*Weathering the Change: Action Plan 1* provided a framework of measures to commence the Territory’s journey to a low-carbon future. The ACT Government also participates in a range of national forums to achieve a nationally consistent approach on energy and climate change matters.

Such forums include the Standing Council on Energy and Resources (SCER) and the Select Council on Climate Change (SCCC), as well as the numerous working groups under these councils that are working to progress nationally consistent energy and climate change policy reforms. The ACT is also a party to the National Partnership Agreement on Energy Efficiency (NPA-EE) under the National Framework on Energy Efficiency, which provides for a nationally consistent and cooperative approach to energy efficiency.

Significant progress towards our 2020 targets has already been achieved through the development and implementation of the policies and initiatives listed in Table 3. This progress has been achieved in sectors consistent with Pathway 2 of Draft AP2, such as transport, residential energy use, waste and energy supply.

**Table 3: Policies and initiatives supporting greenhouse gas abatement in the Territory**

Achievement to date	Contribution to greenhouse gas emissions reduction
<i>The Canberra Plan: Towards Our Second Century</i>	The ACT Government’s overarching strategic policy document is <i>The Canberra Plan</i> . First released in 2004, it was updated with a renewed vision and themes in 2008 as <i>The Canberra Plan: Towards Our Second Century</i> . It provides the unifying vision and objectives for the ACT sustainability policy plans.
<i>ACT Sustainable Energy Policy 2011-2020</i>	The <i>ACT Sustainable Energy Policy</i> establishes an integrated policy framework for managing the social, economic and environment challenges faced by the Territory to 2020 as they relate to energy production and use. This includes the implementation of a retailer obligation energy efficiency scheme and pursuing large-scale solar power generation.
<i>Electricity Feed-in (Large-scale Renewable Energy Generation) Act 2011</i>	The ACT’s large-scale feed-in tariff legislation is supporting the development of up to 210 megawatts of large-scale renewable energy generation capacity in the Territory including the current 40 megawatt solar auction process which will conclude in early 2013 and reduce greenhouse gas emissions by around 1,100,000 tonnes CO <sub>2</sub> -e over 20 years.
<i>ACT Waste Management Strategy 2011-2025</i>	The <i>ACT Waste Management Strategy 2011–2025</i> sets a clear direction for the management of waste in the ACT towards 2025. The goal of this Strategy is to ensure that the ACT leads innovation to achieve full resource recovery and a carbon neutral waste sector.
<i>Energy Efficiency (Cost of Living) Improvement Act 2012</i>	A new retailer obligation scheme will commence on 1 January 2013 to drive energy efficiency improvements in homes and small businesses across the Territory. Modelling indicates average savings of around \$300 per household by 2015, and emission reductions of 750,000 tonnes CO <sub>2</sub> -e by 2015. The government is currently investigating the costs and benefits of extending the scheme to the non-residential sector.



Achievement to date	Contribution to greenhouse gas emissions reduction
<i>Transport for Canberra 2012-2031</i>	<i>Transport for Canberra</i> sets a new policy direction for transport from now to 2031 and is built around the principle of providing sustainable travel options and reducing transport emissions, through 'mode shifting' and encouraging a more efficient vehicle fleet. AP2 builds on the emission reductions already targeted under <i>Transport for Canberra</i> .
<i>Green Duty Scheme</i>	The ACT Government was the first jurisdiction in Australia to introduce differential stamp duty costs to provide an incentive for the purchase of lower emission vehicles and a disincentive against the purchase of vehicles with poorer environmental performance.
<i>ACT Planning Strategy</i>	The <i>ACT Planning Strategy</i> establishes how the Territory will develop into the future, to 2030 and beyond towards 2060. It builds on Canberra's existing city structure to become a more compact, sustainable city. The future growth of the city places greater emphasis on urban intensification in town centres, around group centres and along key public transport corridors to provide more sustainable living, working, and transport choices.
New residential solar access provisions	Draft Variation (DV) 306 to the Territory Plan incorporates a number of important provisions for solar access. This includes a requirement that residential blocks should be oriented and proportioned so that a house can be designed with daytime living areas facing north and sunlit private open space. DV 306 also provides that new developments should not unreasonably impact on a neighbour's access to sunlight. DV 306 contains a new Estate Development Code with block compliance tables that indicate which blocks are considered to be 'complying', acknowledging that certain combinations of block size, slope and orientation are more likely to achieve solar efficient house design.
ACTSmart and Outreach programs	<p>The government continues to provide a range of programs aimed at reducing emissions and cost pressures for ACT households and businesses, including low income households.</p> <ul style="list-style-type: none"> <li>• ACTSmart: ACTSmart is the central point for ACT Government rebates and assistance for saving energy and water, reduce waste and reducing greenhouse gas emissions.</li> <li>• Through ACTSmart, the ACT Government is helping households, businesses, schools and community groups contribute to a more sustainable future and to reduce the ACT's carbon footprint.</li> <li>• The government's Outreach Program provides assistance to low income households in the ACT to reduce their energy and water bills.</li> <li>• The Home Energy Advice Team (HEAT) provides independent and expert advice on making your home more energy-efficient.</li> </ul>



## Reducing energy consumption and the impact of rising energy costs

The ACT is actively pursuing a wide range of initiatives, both locally and through national bodies, to address the impact of rising energy costs on Canberra's households and businesses.

- **National reforms** – The ACT is an active participant in the development of a range of national energy market reforms being progressed through the Energy Market Reform Working Group (EMRWG) of the Council of Australian Governments (COAG) Standing Council on Energy and Resources (SCER). Notably, through this forum the ACT has implemented the National Energy Customer Framework (NECF) which will facilitate increased competition in retail energy markets and reduce electricity market entry costs and compliance barriers – ultimately reducing costs for consumers.
- **Smart meters** – Interval meters with digital communication and load control capabilities ('smart meters') have the potential to increase the efficient operation of electricity markets and significantly reduce required investments in networks and generation assets needed to service peak demand. The EMRWG is investigating national consistent technical, market and customer protection frameworks that may support the future roll-out of smart-meters.
- **Energy Efficiency Improvement Scheme** – The ACT's Energy Efficiency Improvement Scheme (EEI scheme), will require electricity retailers to undertake household and business energy saving activities from 1 January 2013. The net benefit to an average household is expected to be around \$300 by the end of 2015 and costs savings on bills will continue to grow to around \$2,140 over the lifetime of the Scheme's measures.
- **National Partnership Agreement on Energy Efficiency (NPA-EE)** – The ACT Government, through the NPA-EE, has also committed to the development of a nationally consistent and coordinated package of measures to advance energy efficiency outcomes across the Territory economy.

While significant uncertainty exists over future electricity prices, increasing world commodity prices for gas and the cost of national renewable energy and carbon reduction schemes are likely to continue to place upward pressure on electricity import costs into the future. Unlike local network costs which are largely fixed, electricity import costs can be reduced through energy efficiency, keeping money in our community and supporting future growth and prosperity.

## How AP2 will contribute to meeting our 2020 target

The ACT Government has developed a sectoral approach to identifying and targeting emission reductions across the ACT community and this is reflected in the structure of AP2. These sectors relate to the major sources of emissions from our community:

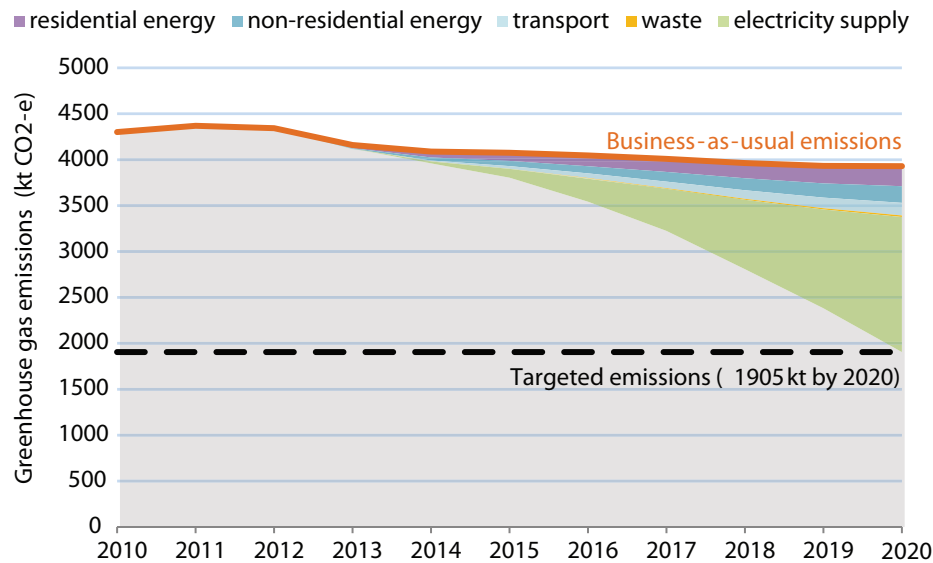
- residential sector energy use
- non-residential sector energy use
- transport sector emissions
- waste sector emissions
- electricity supply sector emissions.

Figure 10 and Table 4 show the contribution each sector can make to achieving our 2020 emissions reduction target. This shows that 553,000 tonnes CO<sub>2</sub>-e emissions savings will be targeted through electricity, gas and transport fuel savings, and through reductions in emissions from the Territory's landfill sites. The remaining reductions (the large green wedge) can be, subject to further policy review, achieved through changing the generation mix of electricity supplied to the territory. Specifically, by 2020 AP2 proposes the development of around 690 megawatts of large-scale renewable energy capacity delivering around 1,900 gigawatt hours of emissions-free electricity per annum.

Further information about how emission reductions will be achieved for each abatement wedge is set out in the following sections of AP2.



**Figure 10: Potential contribution of sectors to meeting our 2020 greenhouse gas reduction targets**



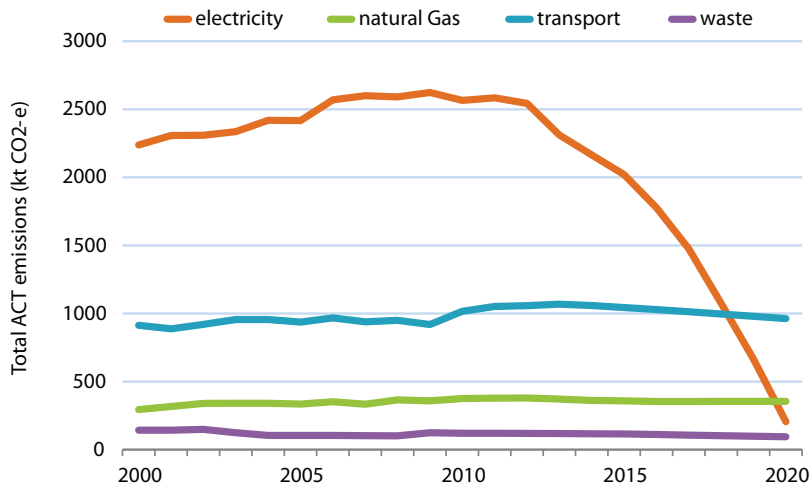
**Table 4: Targeted emission reductions by sector**

Sector	Actions	Emissions reduction in 2020 (tonnes CO <sub>2</sub> -e)
Residential sector energy use	6	218,000
Non-residential sector energy use	3	181,000
Transport sector emissions	1	138,000
Waste sector emissions	1	16,000
Energy supply sector emissions.	3	1,471,000
Climate Change adaptation	3	N/A
Monitoring and reporting	1	N/A
<b>Total</b>	<b>18</b>	<b>2,024,000</b>

The approach taken under AP2 is based on 'Pathway 2' which was overwhelmingly supported during community consultation and will see the Territory become a national leader in renewable energy investment and transform Canberra, and the Australian Capital Region, into a hub of renewable energy innovation and investment.



**Figure 11: Targeted emissions from major sources (2000 to 2020) with AP2**

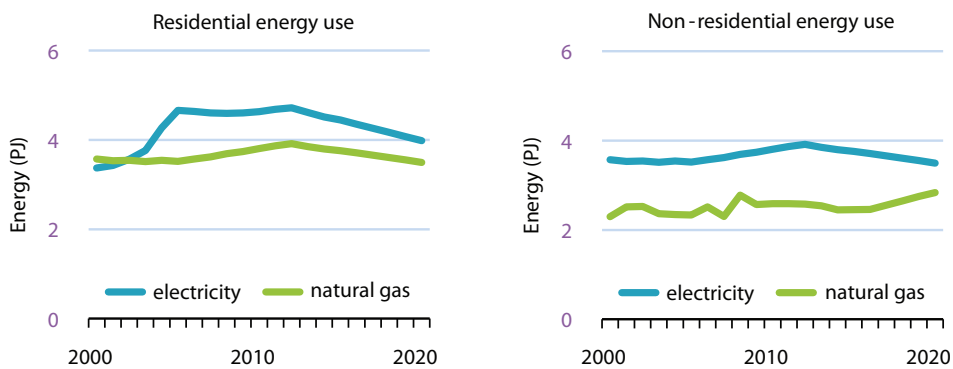


The biggest opportunity for emission reductions under AP2 is in relation to our electricity supply sector. Modelling of the impact of a rapid move to renewable energy shows electricity emissions falling from around 2,050,000 tonnes CO<sub>2</sub>-e in 2012 to just under 230,000 tonnes CO<sub>2</sub>-e in 2020, representing around a 90% reduction.

Transport emissions would to decline around 11% from current levels and emissions from landfills in the waste sector will decline by approximately 7%. Energy-from-waste emission reductions are counted as reductions in the energy supply sector.

Natural gas emissions can be expected to decrease slightly from business as usual estimates, with some increases from switching from electric to natural gas heating offset by an overall improvement in gas use efficiency. An increase in commercial sector gas usage is forecast, partly as a result of increased deployment of high-efficiency cogeneration and trigeneration technology under AP2. This is offset by significant reductions in electricity usage.

**Figure 12: Forecast electricity and natural gas use with AP2 (2000–20)**

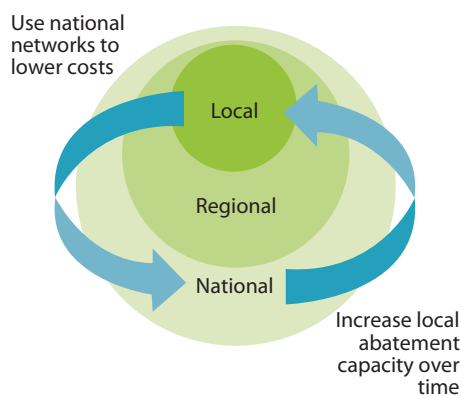




## Priority order for investment

AP2 is also based on a priority order for activities, from local to global, while recognising our place in our region. In the first instance the ACT will look at local options for renewable and low-carbon energy generation. If local projects are not feasible then the barriers to why they are not an option will be explored with a view to eliminating barriers. Prioritising local action will increase local capacity for reducing emissions over time.

**Figure 13: Prioritising local investment**



This priority order will result in greater levels of investment in the ACT and region, with flow-on benefits for local employment. In investing in renewable energy, the Government will also consider local content provisions to further support local employment and make use of extensive research and development capabilities in our region.

## Achieving environmental additionality and complementarity

All measures undertaken in AP2 will be complementary to Commonwealth measures including a price on carbon. To be complementary, the ACT has adopted a policy that a measure must be either:

- **Complementary** – being consistent with COAG Complementarity Principles that limit measures to those that reduce overall costs for greenhouse gas abatement in the Territory; or
- **Additional** – Resulting in greenhouse abatement above and beyond the national pollution cap.

### Summary of COAG complementarity principles

1. Complementary measures are targeted at a market failure that is not expected to be adequately addressed by the carbon price.
2. Where complementary measures have a regulatory impact, they meet best-practice regulatory principles, including that the benefits of any government intervention outweigh the costs.
3. Complementary measures also help manage the impacts of the carbon price on particular sectors of the economy.
4. Complementary measures are implemented by the level of government that is best able to deliver it, and they are effectively coordinated across jurisdictions.

The Commonwealth's commitment to recognise GreenPower as voluntary action provides a way for increasing our use of large-scale renewable energy generation while reducing emissions above and beyond the national pollution cap. This is discussed further in the section Transitioning to large-scale renewable energy.



## Achieving environmental additionality

The Commonwealth Government has committed to taking voluntary action into account when setting pollution caps and treating it as additional when accounting for Australia's post-2012 targets.

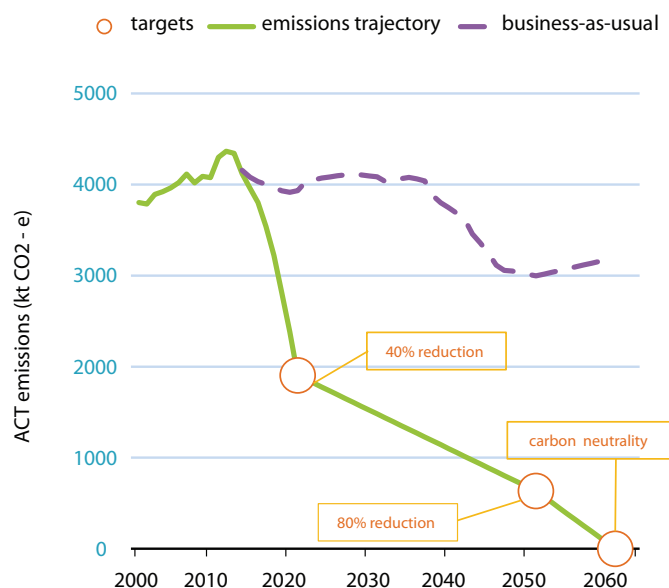
- In the flexible price period, permit holders may voluntarily cancel their permits. A Pledge Fund will be established from the commencement of the carbon pricing mechanism to help individuals access the carbon market and voluntarily cancel emissions units. Contributions to the Pledge Fund will be tax deductible.
- In the fixed price period, the government will measure GreenPower purchases on an annual basis and take these into account when setting the initial pollution caps. In the flexible price period, the government will measure GreenPower purchases on an annual basis and directly take these into account in setting the pollution caps five years into the future. Adjustments to the pollution cap for GreenPower will be backed by a commitment not to count those emission reductions towards meeting the national emissions reduction target.
- Voluntary action in addition to GreenPower and voluntary cancellation of units could also be recognised, on advice from the Climate Change Authority on whether a robust methodology can be developed to recognise additional voluntary action by households.

## Progress towards carbon neutrality in 2060

Achievement of our 2020 greenhouse gas reduction targets will set the Territory well on the way to achieving our target of carbon neutrality by 2060.

While the pathway from 2020 to 2060 is inherently uncertain, technology can be expected to rapidly evolve over that time, creating opportunities for greater cost-effective investment in energy efficiency and local renewable energy generation. In the transport sector, fuel efficient electric vehicles can be expected to greatly increase their market share driven by rapid advances in battery storage technology. National pollution caps will strengthen in line with international agreements and this will enhance the cost-effectiveness of carbon mitigation across our economy.

**Figure 14: ACT emissions trajectory, BAU and targets**







The Territory's Planning Strategy will also play a key role in reducing our emissions as well as helping us adapt to a changing climate. Continuing to invest in good shade trees in our streets provides shade and shelter for houses and reduces the need to turn on air conditioners. A more compact urban form will reduce trip times and encourage cycling, walking and sustainable public transport.

### Canberra's urban structure and form in our region

To achieve our legislated emissions reduction target by 2060, we will have to change Canberra's urban structure and form so it supports more sustainable, lower energy lifestyles. We will have to further improve the environmental performance and sustainability of our buildings and that of the physical urban infrastructure that supports our city—the power grid, the transport and water systems and our public spaces.

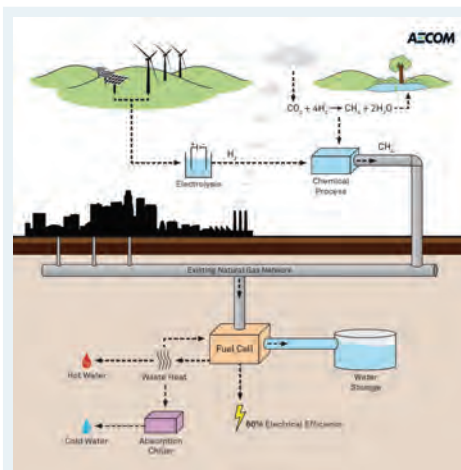
With Australian Government proposals for a very fast passenger rail service between Sydney, Canberra and Melbourne, the prospects for the Australian Capital region will change. This infrastructure would allow easier commuting to cities from regional areas and when accompanied by investment in the National Broadband Network, a significantly greater opportunity arises for people to have flexibility in where they live and how they work. The introduction of a very fast rail service underscores the importance of taking a regional approach to human settlement and how we value the land.

A major challenge in reducing emissions beyond 2020 levels will be how to reduce emissions from the consumption of natural gas. Natural gas usage is expected to remain constant, or grow slightly to 2020, greatly contributing to emission and cost reductions by replacing electricity use in inefficient space and water heating application.

Australia's identified economic natural gas resources have increased threefold over the past 20 years, with current reserves expected to last over 200 years at current production levels.<sup>9</sup>

Gas has inherent advantages over electricity in its cost, but also its overall efficiency in space heating and water heating applications, especially when combined with onsite power generation (cogeneration).

From 2020 we can also expect to see improvements in the cost-competitiveness of renewable sources of gas, such as syngas from the combustion of biomass and the production of methane from hydrogen. While these developments will provide a basis for ongoing reductions in emissions to achieve our objective of carbon neutrality in 2060 the research and development of new technologies in this area are beyond the scope AP2. The Territory will need to closely monitor trends and developments to 2020 and beyond.



**Figure 15: Example of a renewable gas network**

Emerging technologies make it possible to produce natural gas from renewable energy sources. In this example, hydrogen is produced from water and wind energy which is then combined with carbon dioxide to produce methane (natural gas) for distribution through standard natural gas networks.

Using a fuel cell, natural gas can then be converted to electrical energy as well as hot and cold water to heat and cool homes and businesses. Alternately, hydrogen could be used as a transport fuel.

The whole process is sustainable and produces no harmful emissions. *Source: AECOM 2012*

9 Bureau of Resources and Energy Economics (2012) *Energy in Australia 2012*.



## The cost and benefits of action

Investing in climate change mitigation often means paying now for benefits that will accrue over the medium to long term. In some cases, however, such as when we invest in cost-effective energy efficiency, the benefits can be immediate and result in significant net savings over time.

This is the case with the ACT Government's Energy Efficiency Improvement Scheme which is forecast to reduce residential sector emissions by around 6.2% by 2015, with average net savings of around \$300 per participating household over its initial three-year term. This equates to a Net Present Value of \$40 million for the Territory, as a result of actions implemented over that period. Participating household bill savings, and the value of the Scheme to the Territory, will greatly increase out to 2020 with the potential extension of the scheme beyond 2015.

The benefits of acting on climate change must be understood at the local and global levels.

- Locally, strong action on climate change will be a clear demonstration of the values of the ACT community who overwhelmingly understand the risks of unmitigated climate change and our moral obligation to be part of the solution.
- Locally, the ACT, as a knowledge-based economy, is in a strong position to benefit from intellectual property and employment generated in the emerging clean energy and low carbon economy. We already have an international hub for research into alternative fuels and renewable energy as well as climate change economics and adaptation. Our investments in clean energy research and technology will support the ACT, and our region, to become a national clean energy hub providing sustainable employment growth into the future.
- Locally, the ACT will benefit from direct energy cost savings from improved energy efficiency of our homes and businesses and changes in behaviour. These savings will build over time and help insulate our community from energy prices over the coming decades.
- Globally, while the ACT's emissions are very small in an international context, strong action on climate change will add our voice to the growing chorus of communities that are stepping up to the challenge of achieving emission reductions consistent with what the scientific community is telling us is required to avoid the most dangerous impacts of climate change. By demonstrating leadership, we can provide a further example for others to follow.

### Case study – Copenhagen carbon neutrality

Copenhagen, Denmark is a world leader in emissions reduction activities. Copenhagen has an emissions reduction target of 20% below 2005 levels by 2015 and a vision of achieving carbon neutrality by 2025.

Copenhagen aims to meet the majority of its emissions reduction targets by reducing the emissions intensity of its electricity supply and increasing energy efficiency. Already 98% of all homes in Copenhagen are connected to a district heating systems based on combined heat and power plants and incineration of waste. The city aims to reduce reliance on fossil fuels by investing in biomass in power stations, erecting windmill parks and increasing reliance on geothermal power.

Improving the energy efficiency of existing buildings and requiring new developments to meet stringent efficiency guidelines will improve Copenhagen's energy efficiency. The education of residents and building managers on how to maximise the benefits of energy efficiency technologies is also an important element of this climate plan.

More sustainable transport will be achieved by planning for a city which favours biking and walking and improves access to public transport.

*Source: City of Copenhagen (2009) Copenhagen Climate Plan.*



While the costs of renewable energy and the cost-savings from energy efficiency to 2020 are inherently uncertain, Table 5 provides an indication of the expected costs and savings to our community from implementing the pathway set out in AP2.

Savings are the result of improvements in household energy efficiency, while costs result from renewable energy investments. Combining the two, net savings are expected to result from the pathway set out in AP2 at around \$30 per household to from 2013 to 2017. Net costs are estimated to grow from around zero in 2018 peaking at around \$60 per household in 2020 before again declining. It is important to note that costs of transport fuel savings are not included in this net savings calculation amount due to some uncertainty around the allocation of these costs to households. However, on the basis of conservative estimates, these may more than offset net cost to households arising from potential renewable energy investments.

**Table 5: Potential economic costs and savings\* of AP2 initiatives**

Emissions sector	Potential costs and benefits (not discounted)
Residential energy	Cumulative energy cost savings to 2020 from the implementation of energy efficiency measures are estimated at around \$140 million for the residential sector, or over \$800 per household. This equates to savings of over \$33 million, or \$210 per household in 2020. In addition to costs from moving to renewable energy sources, energy efficiency policies can also have pass through costs, such as in the case of a retailer obligation scheme. Whether or not to pursue such a scheme after 2015 will depend on a regulatory impact assessment to be undertaken by government in consultation with stakeholders.
Non-residential energy	Cumulative energy cost savings to 2020 from the implementation of energy efficiency measures are estimated at around \$93 million for the non-residential sector. This equates to savings of over \$24 million in 2020.
Waste	Net savings are expected to result from reduced waste generation and reduced carbon price liabilities. Costs associated with energy-from-waste are included in the electricity supply sector calculations.
Transport	Cumulative fuel cost savings to 2020 from the implementation of Transport for Canberra and the Low Emission Vehicles Strategy are estimated at around \$395 million. This equates to savings of around \$118 million in 2020.
Energy supply	Increasing renewable energy usage to meet our 2020 target is expected to have a cost peaking at around \$370 million to 2020 or between \$270 and \$305 per household in 2020.

*\*Stationary energy savings are determined on the basis of savings on imported electricity (wholesale costs and Large-scale Renewable Energy Target (LRET)/ Small-scale Renewable Energy Scheme (SRES) costs only). Fuels cost savings are conservatively based on prices escalation from \$1.37 to \$2.06 in 2020.*

## Renewable energy costs in context

The ACT currently has the lowest household electricity prices in Australia. This provides the ACT with a competitive price advantage over other Australian jurisdictions, an advantage that has not traditionally been exploited through, for example, the deployment of energy intensive industry. The ACT is predominantly a service based economy that has relatively low energy intensity.

Through implementing the pathways set out in AP2, electricity prices are forecast to increase by up to 16% to fund renewable energy investment and ensure our greenhouse gas abatement targets are met. Table 6 shows that, on the basis of current electricity prices, even with a 16% increase the ACT, would maintain the lowest electricity prices in Australia. While the difference between jurisdictional electricity prices will change over time, our advantage in having a well-planned low cost electricity network can be expected to ensure a relative price advantage is maintained into the future.



**Table 6: Australian household electricity prices**

Jurisdiction	2012–13 household electricity price: c/kWh <sup>10</sup>	Difference from ACT (%)
Queensland	27.05c	+31%
New South Wales	31.63c	+53%
ACT	20.66c	-
Victoria	28.67c	+39%
South Australia	30.77c	+49%
Tasmania	24.98c	+21%
Western Australia	28.91c	+40%
Northern Territory	27.14c	+31%

Price increases will affect members of the community differently. The ACT will work with the ACT community to ensure vulnerable groups are protected from rising energy prices by improving energy efficiency and help offset costs through the ACT Government’s energy concessions programs. Action 18 commits the government to undertaking annual reporting of cost of living and social equity impacts.

### The economic impacts of AP2

Economic modelling undertaken on the basis of draft AP2 shows that a greenhouse gas reduction strategy based on energy efficiency and renewable energy can deliver the 2020 greenhouse gas reduction target with a cost to Gross State Product of less than one fifth of a percent by 2020, or three quarters of a percent by 2050 - which is less than the expected impact of the national carbon pricing scheme.

To illustrate further, this means that in real terms AP2 delays the achievement of business as usual Territory economic output in 2050 by only three months. While this may appear counterintuitive, it can be explained as the carbon price affects activity across Australia, including increases in the general cost of capital, while the effects of the ACT specific measures are direct and local.

This cost to economic growth is very small in the context of the ambitious targets set by the Assembly which have long term benefits towards mitigating climate change.

The modelling also demonstrates that to maximise the economic benefits of AP2 it is beneficial to promote investment within the Territory as opposed to elsewhere in Australia. To address this AP2 prioritises investment in local projects both through energy efficiency and renewables.

AP2 also adopts an adaptive management approach which provides flexibility to lower implementation costs and maximise local benefits, over the course of the strategy.

<sup>10</sup> Australian Energy Market Commission (2011) *Final Report: Possible Future Retail Electricity Price Movements: 1 July 2011 to 30 June 2014*

# 3.

## REDUCING RESIDENTIAL SECTOR EMISSIONS



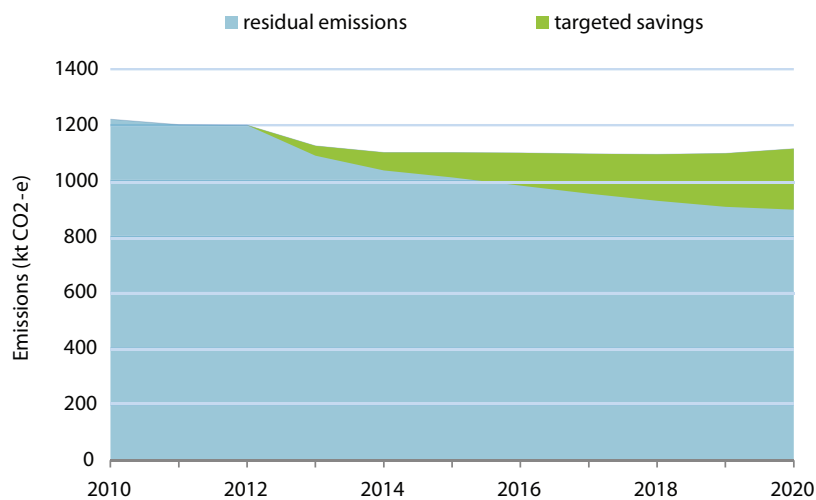


This section provides a summary of the scope of opportunity and challenges in the residential sector, and outlines key actions the government will undertake to reduce emission under AP2.

## Business as usual projections

It has been estimated that the residential sector has the potential to reduce emissions by around 220 kilotonnes CO<sub>2</sub>-e by 2020 through upgrading existing residential buildings, improving heating systems and encouraging the uptake of high-efficiency appliances. This is a saving of around 20% from projected business as usual residential sector emissions in 2020. In many cases, the value of potential energy savings more than offset the cost of action. These savings are in addition to existing measures such as the new 6-star residential standard for new buildings and household, expected growth in rooftop solar and GreenPower purchases.

**Figure 16: Potential reductions in residential sector emissions under AP2**



AP2 will target these emission reductions through a range of measures that seek to reduce energy consumption, and related costs and emissions, in the residential sector.

## Improving energy efficiency for new and existing premises

Success in achieving our greenhouse gas abatement targets depends on action by everyone: government, business, community groups, households and individuals. We will need to be smarter in how we use energy and the energy we use must be cleaner. Our choices will involve investment in more sustainable energy use, adoption of new technologies and changes in lifestyle. We will need to ensure that our choices do not increase social inequities within our community and that we implement cost-effective and efficient solutions.

Despite ongoing improvements in energy efficiency, there remains a large potential for additional energy savings across all sectors of the economy. These opportunities will persist under a national carbon pricing scheme due to a wide range of inherent market failures and will not be realised without additional government intervention.

The ACT Government, through the *National Partnership Agreement on Energy Efficiency* (NPA-EE), has committed to the development of a nationally consistent and coordinated package of measures to advance energy efficiency outcomes across the Territory's economy.





## **ACT specific commitments under the *National Partnership Agreement on Energy Efficiency***

### ***Theme 1: Assisting households and businesses to transition to a low-carbon economy.***

Provide support to businesses to assist them in improving their energy efficiency and to make informed choices regarding energy efficiency by addressing barriers.

- Targeted outreach information; support business identification of energy efficiency opportunities; initiatives for small and medium-sized enterprises (SMEs).

Showcase and promote energy efficiency technologies and energy conservation measures.

- Use community and government buildings to showcase reduced energy intensity in the way Australians live and work.

### ***Theme 3: Making buildings more efficient.***

All jurisdictions will work together to develop a consistent outcomes-based national building energy standard setting, assessment and rating framework for driving significant improvement in the energy efficiency of Australia's building stock.

- Phase in mandatory disclosure of residential building energy, greenhouse and water performance at the time of sale or lease, commencing with energy efficiency by May 2011.

Provide incentives for residential building owners to undertake energy efficiency improvements.

- State and Territory Programs.
- States and territories to audit the energy efficiency of their public housing stocks.

Provide and promote information on energy efficient housing options.

- Demonstration projects.

### ***Theme 4: Government working in partnership and leading the way.***

Governments to significantly improve the environmental performance of the buildings they own or occupy.

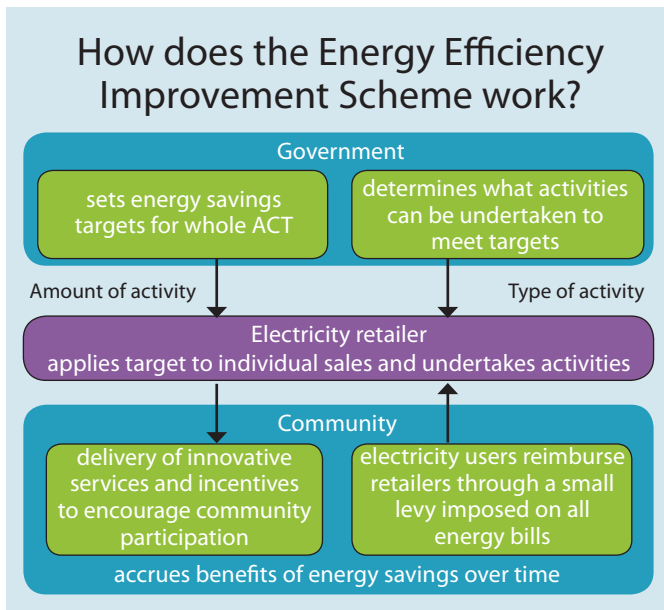
- Increase performance of government buildings.
- Energy performance contracting.

Reducing energy use in existing homes is one of the easiest and most cost-effective ways for the Territory to reduce emissions and reduce our ongoing exposure to rising electricity and gas prices. In addition to the NPA-EE, the ACT and a number of other jurisdictions has developed a retailer obligation energy efficiency scheme. Such schemes have been demonstrated to be highly cost effective in reducing greenhouse gas emissions and consistently deliver net economic benefits.

The ACT's *Energy Efficiency Improvement Scheme* (EEI Scheme) will commence from 1 January 2013 and run for an initial term of three years. It works by requiring electricity retailers to implement a targeted level of energy savings in ACT homes. Retailers then have to offer incentives to encourage the participation of households, such as in the form of rebates, discounts, of attractive financing terms. While retailers are allowed to pass through their costs, importantly, the scheme is designed to ensure that the value of energy savings greatly exceeds the pass-through amount.



## How does the Energy Efficiency Improvement Scheme work?



The ACT's EEI Scheme has been designed to minimise the impact on electricity suppliers, especially smaller suppliers and new market entrants. This is consistent with the ACT Government's objective of supporting enhanced retail competition in the Territory. Smaller retailers will be able to discharge their obligations by paying an Energy Saving Contribution equal to the expected costs of major participating retailers. This will result in funds being raised by government to support complementary programs such as additional incentives for low-income households or other hard-to-reach members of the community.

## Who benefits from energy efficiency?

- **A rental tenant** who installs a standby power controller and a water efficient showerhead may achieve savings of \$287 per annum for an upfront cost of \$140 after incentives. A further \$45 per annum could be saved by purchasing a high efficiency refrigerator.
- **A homeowner** who replaces an inefficient resistive electric heater with a mounted split reverse cycle heater could be up for annual savings of around \$280 per annum, while improving comfort and increasing the house's resale value. A further annual saving of around \$450 could be made by replacing an electric storage hot water heater with gas boosted solar (these numbers do not include the upfront installation cost).
- **A landlord** who installs insulation in a rental property can increase the star rating of their house while generating savings for the tenant of around \$500 per annum, increasing value for tenants as well as potential rental returns (these numbers do not include the upfront installation cost).

Depending upon the measure and the income level of each household, the capital costs may be subsidised or even paid entirely by the electricity retailer.

The cost saving benefits from the EEI Scheme are significant and it is anticipated that the EEI Scheme will be able to be extended beyond the initial three-year period following a scheme evaluation in 2014.

The Commonwealth Government has undertaken consultation with stakeholders, including the ACT Government, to assess the regulatory impacts of a national scheme intended to replace existing jurisdictional schemes. The development of a national scheme will be subject to COAG agreement and is not expected to be implemented until 2015 at the earliest. The ACT Government will consider merging with a national scheme where it is demonstrated to be in the interests of the Territory and consistent with its cost saving and greenhouse gas abatement objectives.





For the purposes of AP2, the government has modelled a continuation of the EEI Scheme to 2020 assuming the same rate of energy savings. In reality further cost-effective energy savings opportunities are expected to be attainable before 2020 based on emerging technologies such as LED lighting and the commercialisation of more efficient appliances with lower standby power. This will be driven by increasing global demand for more energy efficient products. While the ACT is too small a market to be a major driver of technology change, schemes like the EEI Scheme can help ensure our community is a beneficiary of new technologies as they emerge.

**Action 1:** The ACT Government's Energy Efficiency Improvement Scheme will commence from 1 January 2013 requiring retailers to implement energy efficiency improvements to ACT homes with a focus on low-income households. The Scheme will be extended to 2020 subject to outcomes of the scheme review in 2014 and developments at the national level.

## Phasing out high-emissions and inefficient water heaters

In 2009 COAG agreed to a 10-year plan for low-emission water heaters as a component of the National Hot Water Strategic Framework (NHWSF). From 31 January 2010, the ACT Government restricted the type of water heaters that can be installed in new detached houses and townhouses. Hot water heaters that produce high emissions from their operation, such as electric resistance water heaters are no longer permitted, however, an electric-boosted heat pump or solar water heater can be installed if it meets the minimum standard.

Analysis undertaken by pitt&sherry in preparation for AP2 has indicated, consistent with similar studies undertaken in other jurisdictions, that replacing electric resistive water heaters with low-emissions water heaters such as gas, solar or electric heat-pump water heaters can be highly cost-effective.<sup>11</sup> Improving the efficiency of water heaters, including those using lower-emission fuels can also be beneficial.

Installing certain low-emissions heaters is expected to be an eligible measure under the EEI scheme from 1 January 2013, but further cost-effective savings can result from restricting the installation of replacement high emissions hot water heaters, including standard electric resistance water heaters in houses and townhouses (Class 1 buildings). This would generally apply when an existing water heater reaches the end of its serviceable life.

Limiting the restriction, in the first instance, to houses and townhouses in gas reticulated areas can ensure that a number of affordable alternative options are readily available. Such replacements can be eligible for rebates under the Commonwealth Small-scale Renewable Energy Scheme (SRES) as well as the ACT's EEI Scheme for high efficiency replacement systems.

The ACT will introduce legislation to restrict the replacement and installation of high emissions water heaters from 1 July 2013, subject to finalisation of a regulatory impact assessment (RIS), building on assessments undertaken for AP2 and the NHWSF. Specific considerations for the government through the RIS and regulatory development process will be how best to ensure replacement systems operate efficiently such as having appropriate orientation and configuration standards, cold-climate performance characteristics for heat-pump water heaters, and skills and training for trades involved in the installation of eligible water heaters.

<sup>11</sup> pitt&sherry (2011) *Weathering the Change The ACT's Draft Climate Change AP2: An analysis of pathways, costs and benefits.*



## Gas-boosted solar water heaters

When installed and configured correctly, a gas-boosted solar water heater can generate the least greenhouse gas emissions per unit of heated water of any low emission water heater. A gas-booster can be installed inside your hot water tank or between the hot water tank and your home. The second option can deliver the lowest greenhouse gas emissions, as water is only heated to the desired temperature at the time of use, which reduces heat losses. A gas-booster between the tank and your home also ensures you will never run out of hot water, so is a great option for large families. Of course, gas-boosted solar hot water heaters can only be used in areas with a gas supply (including LPG).

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

Apartments and forms of housing other than single dwellings are forming an increasing percentage of new housing stock. Consideration of water heating options at the design and construction phases of a building's lifecycle can reduce the cost of installation and avoid the need for often expensive and impractical retrofits.

Measures to improve building energy performance being pursued by the ACT Government and by COAG provide an opportunity to review the standards for water heating services in other types of residential buildings and potentially introduce similar emissions standards across all residential building classes.

**Action 2:** Subject to a regulatory impact assessment, the ACT Government will introduce legislation to restrict the replacement and installation of high-emission water heaters in houses and townhouses in gas reticulated areas and will investigate the expansion of emissions standards for hot water heaters to all new residential buildings by June 2014, with a view to introduce new standards in the 2015 revisions of the ACT building code if found to be cost effective.

## Improving efficiency in rental properties

Rental tenants can often feel restricted in their ability to find information about the efficiency of their home and in opportunities to cut energy use. Landlords can sometimes lack incentives to make efficiency improvements such as installing insulation or replacing inefficient water heaters and space heating systems, given it is the tenant who ends up paying the energy bills.

The ACT's EEI Scheme will provide support for a range of measures available to tenants such as the installation of efficient appliances and lighting and draught sealing. The experience of the South Australian Residential Energy Efficiency Scheme (REES), on which the Territory's EEI Scheme has been modelled, indicates that rental tenants are just as likely to take up energy savings services offered by energy retailers as owner-occupiers and that the participation rate for tenants has increased over time. The ACT Government will closely monitor the implementation of the EEI Scheme to ensure it is delivering to all sectors of the community including rental tenants.

The proposed restrictions on high emissions water heaters is expected to substantially reduce water heating costs for tenants to 2020 as existing water heaters fail and are replaced.

The ACT has led the nation in requiring information on the energy efficiency of the majority of residential premises to be disclosed at the time of sale. The *Residential Tenancies Act (1997)* also provides that, where a valid energy efficiency rating exists for a residential premises to be let, it must be disclosed to prospective tenants and revised if required. To date the ACT remains the only jurisdiction in which purchasers of residential premises have access to an independent energy efficiency assessment for the property.



While some tenants can access information about the general efficiency of their home or a property they are considering, the ACT Government is determined to ensure that all prospective tenants have useful and reliable information on the energy efficiency of homes they are considering renting. This is because homes with inefficient fixed appliances and poor thermal performance can cost hundreds of dollars more each year to live in, often with lower levels of comfort in hot or cold weather. This can have a big impact on cost of living pressures, as well as occupant health and wellbeing. Rental tenants can also play a big role in our community's response to climate change.

The ACT Government is currently considering a range of options to extend the residential mandatory disclosure scheme to rental tenancies, so that prospective tenants can be better informed about potential energy use in a premises. This outcome, however, needs to be carefully balanced against compliance costs for landlords which may be passed through to tenants.

As opportunities for altering and upgrading the premises for tenants differ to those for a person that owns the premises, the form of the assessment for rental disclosure may also differ from the thermal performance assessment currently required for premises for sale. However, it is expected that the requirement to provide a current sale assessment to tenants, if it exists, will continue. The government will conduct a regulatory impact assessment including consultation with property and community stakeholders to determine a strategy for the mandatory disclosure of home energy efficiency that best suits the Territory, and the needs of our rental tenants.

**Action 3:** Subject to a regulatory impact assessment, the ACT Government will introduce legislation to require landlords to provide information to tenants on the energy efficiency of homes and fixed appliances and major energy uses. Regulatory impact assessment and stakeholder consultation will be completed in 2013.

## A pathway to zero emission residential buildings

Construction standards for residential buildings will play an important role in reducing the Territory's emissions and improving the potential for reducing household energy costs.

Canberra already has some of the strictest residential energy efficiency construction requirements in Australia. New standards in the 2010 and subsequent versions of the Building Code of Australia (BCA), now Volumes 1 and 2 of the National Construction Code, which commenced in the ACT on 1 May 2010, contain enhanced energy efficiency measures. The standards cover the energy efficiency of the building, lighting and other equipment and complement minimum energy performance standards for air conditioners and the ACT's water heater greenhouse emissions standards. In 2011, the ACT also introduced new provisions that modify the energy efficiency performance requirements to apply to smaller additions and extensions.

### Case study

#### Franklin House, Jigsaw Housing

The Franklin House, designed and built by Jigsaw Housing is an excellent example of energy efficient housing in Canberra. Franklin House uses conventional building materials but through clever design and careful construction achieves an 8 star Energy Efficiency Rating. The efficient, adaptable plan (3 bedrooms, 2 bathrooms, 2 living areas) features passive design elements such as: controlled access to solar gain, use of thermal mass, a highly insulated and well-sealed envelope, an efficient heating system and passive ventilation for cooling.





Canberra’s building industry has responded positively to the new standards with many new ACT homes designed to exceed the minimum requirements. The Territory, through Draft Variation 306, has proposed a major policy change regarding solar access provisions that limit overshadowing of neighbouring residential properties. The new rules are designed to restrict overshadowing of neighbouring properties to no more than a shadow cast by a 1.8 metre fence on the boundary. This will provide the basis for developers and builders to take advantage of passive solar design principles which can reduce or even potentially eliminate winter heating requirements.

The ACT Government will develop and publish a Pathway to Zero Emissions Buildings Policy, to provide a clear vision and strategy for improving building energy performance to 2020 and beyond. The policy will include interim goals for building standards for both new buildings and alterations and additions to 2020 and evaluate strategies for improving energy performance beyond the current standards, including minimum appliance efficiency standards, the interaction of planning, building and energy policies and encouraging construction beyond minimum performance.

New standards will take into account future climate projections and the trends in the greenhouse intensity of network energy supply, particularly how reducing emissions from the grid improve the performance of buildings. The policy would also consider national and international developments, including work on the COAG project to develop a national building energy standard setting, assessment and rating framework.

While it is appropriate to allow time to adjust to the new standards and monitor changes in energy use and construction cost implications before construction standards are increased again, continuing innovations in building materials and practices and integrated renewable energy technologies, will provide opportunities to strengthen standards in the future with the prospect of zero or minimal emission residential buildings sometime after 2020. It is expected that these innovations and improvements will lead to a small improvement in building performance by 2015 without changes to standards. Where the adoption of efficient and cost-effective practices is belated, the ACT Government will consider amendments to relevant standards.

**Figure 17: European targets for low-emission buildings**

Country	Target
Denmark	75% by 2020 (from a base year of 2006)
Finland	Passive house standards by 2015
France	By 2020 new buildings are energy-positive
Germany	By 2020 buildings should operate without fossil fuel
Netherlands	Energy-neutral by 2020 (proposed)
Norway	Passive house standards by 2017
UK (England & Wales)	Zero carbon as of 2016

Source: European Council for an Energy Efficient Economy (2011) *Nearly zero energy buildings: achieving the EU 2020 target*.

**Action 4:** The ACT Government will publish by 2015 a Pathway to Zero Emissions Buildings policy informed by a regulatory impact assessment and stakeholder consultation to be undertaken from 2013 covering residential and non-residential building types.



## Information and advice to ACT households

Reducing our greenhouse gas emissions and reducing our exposure to rising energy prices requires action across all sections of our community. Households and businesses need to understand the importance of acting on climate change and that we are not powerless – the ACT's carbon emissions can be reduced by individuals making small changes to their everyday actions that add up to transformational changes for our community.

At the heart of AP2 is the principle that everyone has a role to play, every action counts and together we can make a difference.

The focus of AP2 is on establishing the policy environment to meet our emissions reduction targets and providing the tools and incentives to make it easier for everyone in our community to play a role. For example, the ACT's new EEI Scheme will result in innovative services to households and small businesses to reduce energy use through the provision of information, advice and targeted financial incentives.

Education and community dialogue is also important. Understanding precedes action, and an informed and engaged Canberra community is better placed to act for its own benefit and the benefit of future generations.

**ACTSmart.act.gov.au** will continue to be the Territory's one-stop-shop for ACT Government rebates and assistance that will help households and businesses save energy and water, reduce waste and cut greenhouse gas emissions.

Through ACTSmart programs, the ACT Government is helping households, businesses, schools and community groups contribute to a more sustainable future and to reduce the ACT's carbon footprint. This includes our nation-leading ACTSmart Office program which provides hands-on assistance to improve recycling rates and reduce waste to landfill – achieving remarkable results in reducing waste and waste management costs for participating businesses.

The ACT Government will ensure the ACTSmart program complements the new EEI Scheme and other climate change and energy efficiency measures to ensure comprehensive advice and support for Canberra households to save energy and reduce emissions. Online information will also be expanded to include factual information on climate change risks and the progress against our targets. Useful and engaging information will be provided through our schools and community organisations to ensure that all parts of community are aware of the benefits available and can access support to implement energy saving actions in the home.

Community engagement outcomes will also be supported by commitments under AP2 to improve the timeliness and transparency of greenhouse gas emission reporting, including the potential for real-time, or near real-time reporting of energy consumption at the Territory level or for network areas. Providing this information and feedback to the community opens up a range of possibilities for communities to participate in innovative energy reduction programs.

Opportunities to more directly involve the community in emission reduction activities will be set out in a new *Climate Change Community Engagement Strategy* which will be published in early 2013 and based on community feedback received through consultations on the draft Action Plan.



## ACTSmart Schools

ACTSmart Schools is a whole-of-school approach, to improve the school's management of resources and facilities including energy, waste, water, biodiversity, school grounds, products and materials. It also addresses educational, social and economic issues associated with the sustainable management of a school.

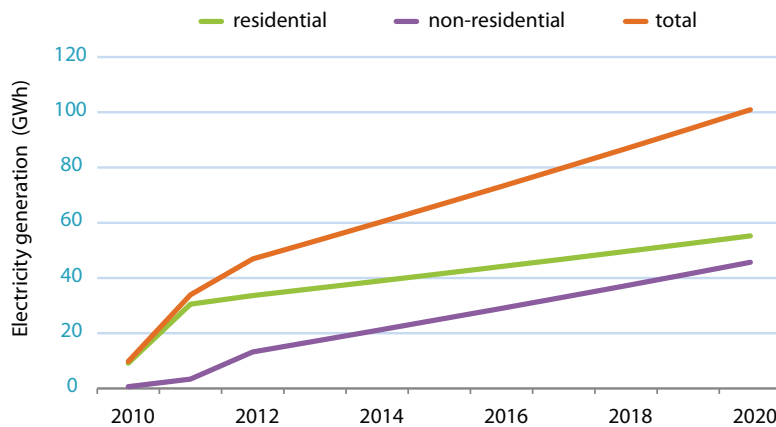
Every school in the ACT is currently working towards becoming an ACTSmart School. These schools have committed to becoming more sustainable and are working with their whole school community to reduce their ecological footprint.

**Action 5:** The ACT Government will continue to build on the experience of its successful ACTSmart programs to develop a comprehensive strategy to engage the community on climate change matters and to provide integrated information, advice and support to Canberra households on reducing energy bills and cutting emissions. This will be guided by a community engagement strategy to be published in early 2013.

## Encouraging rooftop solar

There is growing evidence of continued popularity of small and medium-scale solar, even in the absence of government subsidies. The Australian Energy Market Operator for example has forecast a three-fold increase in small and medium-scale solar energy generation capacity across the National Electricity Market (NEM) by 2020.<sup>12</sup> The ACT's forecasts, adjusted for actual observed uptake rates, are more moderate than this but none-the-less show strong growth over the period.

**Figure 18: Forecast business as usual growth in generation from rooftop solar (<200 kilowatt capacity) to 2020**



By installing rooftop solar, ACT households and business are reducing the Territory's imports of emissions-intensive electricity purchased from the NEM contributing to our emission reductions as measured by our greenhouse gas inventory.

<sup>12</sup> AEMO (2012) Rooftop PV Information Paper



Growth in rooftop solar has been factored into business as usual projections as reduced electricity emissions for the residential and non-residential sectors. Unlike large-scale renewables, while increasing rooftop solar can reduce the Territory's electricity demand, it is not able to produce additional reductions in emissions due to current accounting rules under the Australian Government's carbon pricing legislation. This may change in the future and the ACT Government will press for rooftop solar to be recognised as a voluntary action by the national Clean Energy Regulator.

Increased renewable energy, with a focus on home-based solar photovoltaic (PV) systems was a strong message conveyed by the ACT community through the draft AP2 consultation process.

While the experience in the ACT since the closure of the micro and medium feed-in tariff schemes indicates that a reasonable rate of installation continues, even without feed-in tariff support, the ACT is working with other jurisdictions through the COAG Standing Council on Energy and Resources to develop a nationally consistent framework for the connection and compensation for small scale renewable energy generators connecting to the network. This work, expected to be completed in early 2013, will provide the basis for 'fair and reasonable' feed-in tariffs which will reflect the value of generation systems with regard to energy supply and value to networks, while recognising local circumstances and jurisdictional policies.

While solar energy generation costs continue to come down, the technical and economic potential of solar for the Territory is, to some extent, limited by the intermittency of generation and the limited contribution that solar can make to reducing peak loads on our network, particularly during winter.

Ongoing advances in energy storage technologies offer the potential to increase the contribution of solar to reducing peak loads on the ACT electricity network. These storage devices include batteries in electric vehicles which are expected to be more widespread to 2020 and beyond as well as hydrogen fuel cells that are facing a period of rapid cost decline.

Storage technologies have the potential to reduce network infrastructure costs and planned investment in inefficient peak load energy generation. However, limited information exists on the real world performance of these systems, including costs, technical performance and the role of human behaviour.

The ACT Government will fund a three-year demonstration project to improve the Territory's understanding of this emerging field and the technology, market and behavioural strategies that can increase the economic and technical potential for small scale renewable energy generation, with a focus on small-scale solar photovoltaic generators, and share this knowledge with researchers and policy makers in the ACT and beyond.

The project will build partnerships with research institutions including the Australian National University and the Canberra Institute of Technology who recognise the importance of developing our understanding of these technologies from both a policy development and trades training perspective. Commonwealth funding will also be sought.



Four research streams/outcomes are proposed:

1. **technology** – This stream will focus on monitoring and evaluation of the technical performance of equipment, particularly the interaction between energy generation, energy storage, metering and information and communication technologies.
2. **behavioural** – A behaviour study will appraise the acceptance and use of equipment, and the performance of the energy system from an end-user perspective.
3. **economic** – A study will be conducted into the economic potential of advanced energy storage systems including the wholesale and network value of electricity saved or sent out.
4. **trades** – The project will increase the understanding of the real-world installation and operation of emerging electrical technologies to transfer knowledge and skills into electrical trades training program and identify gaps in competencies for potential integration into trades training.

While household-scale energy storage systems are not cost-effective now, they offer strong economic potential beyond 2020, especially given the expectation that prices will continue to decline into the future. Work in this area will therefore support ACT and national policy development in this space over the medium to long term.

**Action 6:** The ACT Government will conduct a trial of advanced energy technology systems, in partnership with the Australian National University and the Canberra Institute of Technology aimed at increasing the technical and economic potential for intermittent energy sources on the ACT network.



# 4.

## ENSURING A FAIR SOCIETY IN A LOW-CARBON ECONOMY





As the ACT shifts towards lower-carbon and renewable energy sources, the price of energy is expected to increase. Energy price increases can have adverse social implications if people are unable to pay higher energy costs and/or cannot afford the upfront transitional costs required to reduce energy use in response to higher prices.

The ACT Government's ongoing aim is to build the capacity of all individuals and families to access quality energy services, reduce their energy costs, and reduce their carbon footprint.

The ACT Government has already developed a suite of measures to buffer low-income households from the cost pressures associated with the long term impacts of climate change. This includes increasing energy concession payments, reviewing utilities concessions, and ensuring low-income and other vulnerable households are targeted by energy efficiency and water efficiency programs.

### **Outreach Program**

The Outreach program is assisting low-income households to become more efficient in their use of both energy and water at home.

The program is implemented through five principal community welfare organisations, for their clients that are eligible to participate and for eligible clients referred by other community organisations. The program can provide:

- a professional home energy efficiency assessment to each client
- retrofitting of energy and water saving improvements in the home, such as draught sealing, more efficient lighting, water-efficient showerheads and window treatments such as curtains and pelmets
- an energy efficiency education session delivered in the home of each client and tailored to their individual needs, and
- replacement of old, inefficient essential appliances with more efficient models.

Depending on the products and services provided to a given household, it is expected that the Outreach program will enable those participating to save, on average, over \$200 per year on energy bills.

The program is available to concession card holders and other low-income households who are experiencing financial hardship, whether they are living in government housing, private rental accommodation or owner occupied housing.

In the 2010–11 Budget, the ACT Government announced a significant increase in the Energy Concession available to consumers who hold a Centrelink Pensioner Concession Card, Centrelink HealthCare Card or Veterans' Affairs Pensioner Concession Card. Further, the ACT Budget continues to provide for automatic increases to the concession each year in line with the Consumer Price Index (CPI). The ACT is the only jurisdiction to apply an automatic increase mechanism to this type of payment.

Funding announced in the 2011-12 Budget will deliver \$8 million over four years to increase the energy efficiency of public housing tenants across Canberra and ease cost-of-living pressures in recognition of the financial burden posed by utility costs.



### Comparison of the ACT's electricity prices

ACT households enjoy the least expensive electricity prices in Australia. According to the latest Australian Energy Market Commission report, *Possible Future Retail Electricity Price Movements*, by 2013–14 the ACT's household electricity price will be 75% of the average national household electricity price and 71% of the price in New South Wales over the next three years.

The ACT's low household electricity prices are mainly a product of the relatively low distribution network costs paid in the Territory because our local network was originally constructed to a high standard.

It is important to note, however, that ACT households have relatively high levels of electricity and natural gas consumption. For example, in 2011–12, the average level of ACT household electricity consumption (8.2 megawatt-hours) was 20% higher than the average for Sydney households and 50% higher than the average for Melbourne households.

From 1 January 2013, the EEI Scheme will substantially increase the options for low-income households, including public housing tenants, to access advice and practical assistance to reduce energy costs and greenhouse gas emissions. Under the scheme, electricity retailers will be required to achieve at least 25% of targeted energy savings in low income 'priority group' households, ensuring groups such as pensioners, people with disabilities and low income families are net beneficiaries of the scheme and are further protected from rising energy prices.

AP2 commits the government to monitor cost of living and potential social equity impacts and report on these annually to the Assembly (see Action 18)



# 5.

## REDUCING NON-RESIDENTIAL SECTOR EMISSIONS





This section provides a summary of the scope of opportunity and challenges in the non-residential buildings sector, and outlines key actions the government will undertake to reduce emissions under AP2.

## Business as usual projections

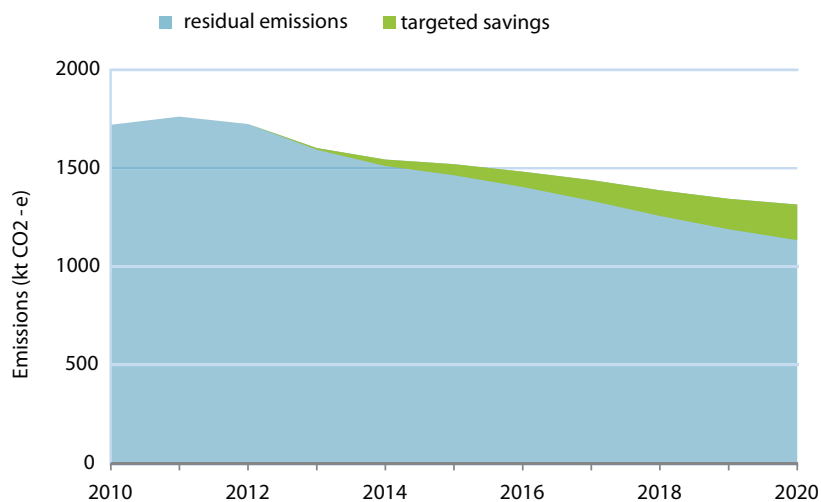
Analysis undertaken for AP2 indicates that our non-residential sector (including business and government) has the potential to reduce annual emissions by at least 180,000 tonnes CO<sub>2</sub>-e by 2020 through implementing cost-effective upgrades to existing buildings and increasing the efficiency of new commercial buildings. This is a saving of around 14% from projected business as usual non-residential sector emissions in 2020.

While the technical and economic potential for energy savings is much higher, a number of barriers exist to increasing the uptake of cost-effective energy saving measures in this sector. The targeted savings for AP2 are therefore highly conservative and may be exceeded through the implementation of new policies on the path to 2020.

Energy demand in commercial buildings has traditionally been unresponsive to changes in energy prices. In particular, tenant light and power demand is determined by the businesses leasing floor space, and owners may receive little or no return in the short term on efficiency investments. Long capital investment cycles for commercial buildings also limit opportunities for major upgrades such as heating, ventilation and air-conditioning (HVAC) equipment. On the other hand, significant opportunities exist in areas such as commercial lighting control and HVAC system controls which often have low capital costs and offer good returns on investment if they can be encouraged.

The challenge for the Territory is to address these barriers and encourage businesses to respond to rising energy prices by driving down energy demand focussing on cost-effective energy saving measures.

**Figure 19: Potential reductions in non-residential sector emissions under AP2**





## Increasing the energy efficiency of businesses and existing non-residential buildings

Small and medium sized business will be able to participate in the ACT Energy Efficiency Improvement Scheme from 1 January 2013 with a small number of eligible activities. The government is also exploring options to expand the scheme to small business and commercial building owners and tenants, offering a potentially powerful way of encouraging the uptake of a range of (typically low cost) energy savings measures in small businesses and existing commercial office buildings.

All business and government energy users in the Territory will fund the scheme through their contribution to scheme pass-through costs. Electricity retailers will have an incentive to offer services to their business customers to reduce their pass-through costs, potentially even by funding low-cost energy efficiency upgrades. Offering these services will also ensure the competitiveness of electricity retail businesses in a market that is increasingly sensitive to rising energy costs and appreciative of the opportunity offered by energy efficiency measures to bring those costs down.

### Potential eligible measures available to businesses under the Energy Efficiency Improvement Scheme

The range of measures available to businesses under the EEI Scheme from 1 January 2013 will be based on the measures available to business under the Victorian Energy Efficiency Target scheme. This includes:

- **water heating** - decommissioning low efficiency water heating products and installing high efficiency water heating products. This category also includes the installation of solar pre-heaters or solar retrofit kits
- **space heating and cooling** - decommissioning low efficiency ducted heating products or central electric resistance heaters and installing high efficiency ducted heating products, installing high efficiency space heating products, decommissioning refrigerative air conditioners and installing evaporative coolers, and decommissioning existing gas ductwork and installing new gas ductwork
- **space conditioning** - installing underfloor insulation and thermally efficient windows
- **incandescent lighting replacement** - decommissioning high energy lamps, including halogen lamps, and installing low energy lamps
- **shower roses** - decommissioning non low-flow shower roses and installing low-flow shower roses
- **refrigerators/freezers** - purchasing high efficiency refrigerators or freezers (refrigerator purchase) and, destruction of pre-1996 refrigerators or freezers (refrigerator destruction)
- **televisions** - purchasing high efficiency televisions
- **clothes dryers** - purchasing high efficiency electric clothes dryers or installing high efficiency gas clothes dryers
- **pool pumps** - purchasing high efficiency pool pumps
- **standby power controllers** - installing standby power controllers
- **motors** - replacing electric motors with high efficiency motors
- **refrigerated Display Cabinets** - replacing refrigerated display cabinets with high efficiency motors, and units
- **refrigeration fans** - replacing refrigeration fans and motors with a high efficiency fans and motors
- **commercial lighting upgrades** - installing efficient lighting equipment.





The ACT Government is assessing the impacts of extending the EEI Scheme to provide fuller business participation. Increased business participation in the scheme would inevitably mean a greater share of the scheme's energy savings target would be achieved by the non-residential sector, compared to the residential sector unless the scheme targets were expanded. In assessing the potential impacts, the ACT Government will be mindful of any potential reduced opportunity for household participation in the scheme. Whether to permit ACT and Commonwealth Government-owned or leased facilities to fully participate in the scheme will be another key consideration.

Reducing energy costs for small and medium business in the Territory will be good for our economy and can underpin employment and prosperity for our community as a whole. The extension of the EEI Scheme to provide for fuller business participation also provides the opportunity to make solid inroads into the cost-effective greenhouse gas abatement potential in the non-residential sector.

**Action 7:** The ACT Government will complete a regulatory impact assessment by the end of 2012 considering the impacts and opportunities for extending the Energy Efficiency Improvement Scheme to include fuller business participation.

Energy efficiency upgrades can often involve significant trade-offs for small and medium sized businesses with cash-flow constraints or limited access to capital. This can result in highly cost-effective energy efficiency measures not being implemented, resulting in unnecessarily high operating costs and reduced profits. This issue is compounded by the lack of awareness of many businesses regarding the energy saving opportunities available to them.

To complement the EEI Scheme, AP2 will establish a new advisory service, *ACTSmart Energy Assist*, for small and medium sized businesses in the Territory to access a range of grants and financial incentives being offered by the Commonwealth as part of the Clean Energy Future plan. The new service will be offered through the ACTSmart Business program and ensure a seamless and integrated sustainability advisory service to the ACT business community.

This service will assist the ACT business community access Australian Government support in the following areas:

- **Energy efficiency grants** – Low Carbon Australia is providing assistance in the form of competitive grants under the Clean Energy Technology Program. This can help industry meet the cost of energy efficiency projects by offering pre-approved finance to support grant bids for the government's Clean Technology Program. The focus is on projects with high demonstration value in order to catalyse wider investment.
- **Energy Efficiency Information Grants** – The Energy Efficiency Information Grants Program is a \$40 million merit-based grants program established by the Commonwealth Government to assist industry associations and non-profit organisations provide practical, tailored energy efficiency information to small and medium enterprises and community organisations.
- **Leasing for energy efficient equipment** – Alleasing has partnered with Low Carbon Australia to create an innovative equipment lease financing product called The Energy Efficient Equipment Lease or *E3 Lease*<sup>™</sup>. This initiative will provide up to \$100 million in equipment leasing finance dedicated to financing the retrofit of energy efficient equipment into existing commercial buildings across Australia.
- **\$6,500 small business asset write-offs** – From 1 July 2012, small businesses will be able to write-off any new business asset costing less than \$6,500 for as many assets as they purchase. Assets costing \$6,500 or more can be depreciated in a single pool from 2012–13 (15% in the year they are purchased, 30% in each subsequent year). This can help small businesses fund upgrades to inefficient equipment such as heaters, pumps and compressors, achieving substantial and ongoing energy costs savings.
- **Carbon neutrality** – Low Carbon Australia's Carbon Neutral Program administers the certification of products or business operations as carbon neutral under the Australian Government's National Carbon Offset Standard (NCOS).





Through ACTSmart Energy Assist, business and community organisations will be provided with up-to-date advice and assistance to help them access support for Australian and ACT Government support programs. Partnerships with business and community groups will be sought to streamline engagement, encourage innovative projects and to develop and provide economies of scale in project development and business engagement. This may include the formation of sector agreements under the *Climate Change and Greenhouse Gas Reduction Act 2010*.

### Sector agreements

Under the *Climate Change and Greenhouse Gas Reduction Act 2010*, a sector agreement is an agreement between the Territory and an individual or group under which that individual or group agrees on a voluntary basis to assist in reducing greenhouse gas emissions in line with the Territory's emission reduction targets, by introducing strategies to:

- a) reduce energy use
- b) increase use of renewable energy sources, or
- c) carry out other avoidance or mitigation activities.

**Action 8:** The ACT Government will establish *ACTSmart Energy Advice* to provide up-to-date practical advice and support to small and medium sized businesses, community groups and representative organisations.

## Improving standards for new non-residential buildings

The Pathway to Zero Emissions Building policy, outlined under Action 4 – Pathway to Zero Emissions Buildings, and goals for building performance will also apply to non-residential buildings. The policy will outline strategies for reducing major energy uses in non-residential buildings, such as heating, cooling, ventilation, and lighting.

From 2010, the *ACT Building (General) Regulation 2008* has incorporated energy efficiency requirements in the National Construction Code with a benefit-cost ratio of 2:1, contributing to estimated energy savings for a building of between 14% to 39% depending on the location and type of building. This is a significant strengthening of standards over previous building codes, which included energy efficiency measures with a benefit-cost ratio of 5:1. Continued evolution in building technology and construction practices, and the potential adoption of the standard benefit-cost ratio of 1:1 currently applied to other building standards, can be expected to result in increased stringency in standards over time.

For modelling purposes, a tightening of energy efficiency standards for non-residential construction standards in 2015 has been assumed as being business as usual. This modelling indicates that this increase in construction standards for new non-residential buildings would only have a limited impact on the achievement on the Territory's 2020 emission reduction targets, but a much greater impact on our long term objective of achieving carbon neutrality.

The National Strategy on Energy Efficiency provides for a nationally coordinated and consistent approach for improving the efficiency of buildings over time, including the introduction of new standards through the National Construction Code, which is developed by the Australian Building Codes Board and given effect by Territory law.

The ACT Government will continue to work closely with state and federal counterparts to ensure progressive improvements in non-residential construction standards over time. Standards developed or adopted by the ACT will be subject to regulatory impact assessment specific to the Territory's climate and market to make sure standards are appropriate for the ACT and its goals.



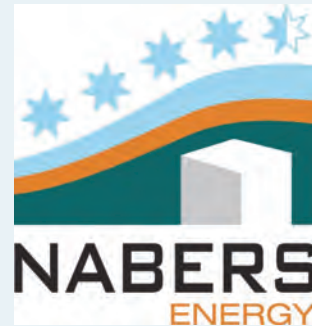
In addition to minimum standards, there are a range of national policies and programs driving improvements in building performance, including mandatory disclosure and government green leasing policies:

- **Commercial Building Disclosure** – Phase 1 of mandatory disclosure commenced in 2010 requiring all commercial office buildings to disclose an energy efficiency (NABERS) rating at the point of sale or lease. This has increased awareness in the property sector of building energy performance and provided a point on which better designed buildings can differentiate themselves in the market place. Phase 2 of mandatory disclosure, currently under investigation, would see the scheme extended to other building types such as hotel, schools and hospitals. The ACT is monitoring the development of the scheme and its coverage of smaller tenancies and buildings that make up a considerable proportion of the Territory's building stock.
- **Green Lease Policies** – The National Green Lease Policy sets a number of minimum performance standards for both tenants and landlords agreed to by all jurisdictional governments. The Commonwealth and ACT Government Green Lease policy and the ACT Environmental Leasing Policy, which specify a minimum of 4.5 star NABERS rating for government tenancies and buildings > 2000m<sup>2</sup>, is having a profound effect on the energy efficiency of new buildings in Canberra. Virtually all new office buildings in Canberra are now designed to reach this operational energy use level, and this will have an increasing impact on the Territory's emissions over time.

The impact of the above policies has also been factored into the business as usual emissions forecast for the non-residential sector.

NABERS is a performance-based rating system for existing buildings. NABERS rates a building on the basis of its measured operational impacts on the environment, and provides a simple indication of how well you are managing these environmental impacts compared with your peers and neighbours.

NABERS - the National Australian Built Environment Rating System - is a national initiative managed for all jurisdictions by the NSW Office of Environment and Heritage.



## Encouraging innovation in building energy systems

The incorporation of cost-effective renewable and low carbon energy sources in new commercial buildings presents a major opportunity to go beyond minimum standards and substantially reduce emissions from new developments.

Many larger electricity customers have a stronger incentive than residential customers to install electricity generation systems that reduce their electricity demand at times of peak demand. This is because time-of-use pricing means they are exposed to peak energy tariffs and network demand charges. Increasingly businesses, such as owners of commercial office or retail buildings, are using solar photovoltaic (PV) generation to reduce their electricity demand at peak times to reduce energy costs. Often energy generated is used onsite rather than being fed back on the network under a feed-in tariff arrangement. Businesses make savings by avoiding the full retail cost of electricity rather than receiving a subsidised rate for the electricity sent out.

The NSW/ACT summer peak demand for electricity typically occurs between 3.30pm and 4.30pm when, on average, renewable energy generation systems are only generating at 29% of their maximum output. This situation is improved, however, for commercial premises where business operating hours mean that peak generation more often aligns with peak consumption.

AP2 assumes continued growth in rooftop solar generation as a business as usual condition.



## **Cogeneration and trigeneration**

Cogeneration and trigeneration are electricity generation systems that produce multiple sources of energy from a single fuel. With cogeneration, a gas engine, turbine or a fuel cell may be used to generate electricity and the waste heat from that process, which would normally be discharged to the atmosphere in a conventional power generator, is captured and used for water heating or space heating purposes.

Fuels cells typically have higher upfront costs but have a higher electrical efficiency (producing more electricity and less heat per unit of fuel). In a trigeneration system, an absorption chiller is added to produce chilled water from waste heat – which can be used for refrigeration or air-conditioning.

Capturing waste heat and using it for heating or cooling applications greatly increases the utilisation of energy in the fuel, thereby reducing total fuel usage and emissions. By generating electricity locally, businesses can save on transmissions and distribution losses. Unlike normal power generation, this electricity is typically used onsite or distributed over a private network, rather than being sent to the broader network.

Cogeneration and trigeneration can also be designed at a district level, sometimes referred to as district heating or cooling, where multiple sites are served by a central plant. Such systems, while common in Europe, America, Canada and Japan, have not been implemented in Australia. Whilst the climate and layout of our city provides great potential for the application of district heating, a number of complex regulatory issues need to be resolved to provide a transparent and efficient approvals process. These include both technical and economic regulation issues at a local and national level.

The ACT Sustainable Energy Policy established a basis for the government to actively explore cogeneration at major developments – such as the proposed upgrade of The Canberra Hospital and the Braddon-Reid redevelopment. Investigations to date have already indicated strong potential for cogeneration at The Canberra Hospital and the proposed Gungahlin Leisure Centre.

Also, the ACT Planning Strategy makes clear that the master plan process that guides urban intensification in town centres, is an opportunity to explore opportunities for 'green' infrastructure including localised power generation systems.



Modern hospitals have large electrical, heating, cooling and data demands. For these reasons an investigation into the possible energy delivery options for The Canberra Hospital (TCH) has been carried out to identify energy delivery options which reduce green house gas emissions, increase hospital reliability, reduce capital and operating costs and match the aesthetic of the site.

A central plant (a natural gas fired reciprocating engine cogeneration system with absorption chillers and natural gas fired hot water generators) was found to provide construction savings of approximately \$28.1million over 20 years (\$7 million in the construction phase) and 4,000 tonnes of greenhouse gas emissions.

The community feedback was clear that this is the preferred option providing that both noise and chemical emissions are thoroughly investigated and mitigated to ensure a safe and healthy campus and a negligible impact on hospital users and the local community.



More information is needed on the profile of heating and cooling loads in major commercial areas so as to inform and direct private investment in precinct scale systems, as well as on potential generator site locations and piping routes. A survey of potential customers for district heating and cooling will be conducted with aggregated results published online. An Expression of Interest process will be conducted to gauge private sector investment interest in precinct-scale investment in the Territory.

### European Cogen Mapping Project

Ecoheatcool was a project co-financed by the EU Intelligent Energy Europe Programme. The project estimated and mapped heating and cooling demand across Europe to inform business and government about low-carbon district heating and cooling investment opportunities.

The ACT Government will survey major commercial districts and government buildings and planned new development in Canberra to identify opportunities for investment in precinct heating and cooling across the ACT.

## Reviewing regulatory barriers to distributed generation

The ACT Government also needs to carefully review regulatory frameworks that would apply to district heating and cooling to provide an efficient approvals process to encourage investment and ensure effective safety, environmental and consumer protections are in place. A whole-of-government approach, encompassing land release, planning and regulatory processes, is required to achieve the best outcomes for the Territory.

The Environment and Sustainable Development Directorate (ESDD) as a planning authority and technical regulator is well placed to coordinate this and can draw on work currently being coordinated across jurisdictions through the Standing Council on Energy and Resources, including the *Power of Choice* review into demand side participation in the NEM being undertaken by the Australian Energy Market Commission.

The 2012-13 Budget provides funding to review the *Utilities Act 2000* to improve regulatory frameworks for distributed generation and embedded networks.

The ACT Government will also review the case for greater incentives for encouraging low-carbon building energy systems through its inclusion in the BCA building energy rating and assessment framework. Action 4 – Pathway to Zero Emissions Buildings will address these matters in the context of both major residential and non-residential building types.

**Action 9:** The ACT Government will survey buildings in major commercial districts to develop a map of heating and cooling loads across the Territory to facilitate private investment in low-carbon energy networks. The government will look for opportunities to streamline regulatory processes through its review of the *Utilities Act 2000*.



## Reducing emissions from ACT Government operations

The ACT Government occupies a diverse range of properties and facilities in order to conduct its operations and provide services to the community. The government is responsible for around 4% of the ACT's greenhouse gas emissions and is in a strong position to invest in many of its own buildings and energy-using assets, since there is long term certainty of tenure and service provision.

The ACT Government is committed to leading by example and working to achieve carbon neutrality in its own operations by 2020. The long term strategy for achieving this will be outlined in the Carbon Neutral ACT Government Framework, with implementation commencing late in 2012. Carbon neutrality will cover central operations and services such as office accommodation, the corporate fleet, the ACTION bus fleet, streetlights, and community, education and health services. The ACT Government Carbon Neutral Framework will follow these key steps:

- Step 1: Measure, monitor and report emissions.
- Step 2: Minimise the carbon footprint by implementing mitigation measures.
- Step 3: Source credible emission reductions to offset residual emissions.

As a fundamental step, the government is establishing a Sustainability Data Management System to support the collection and analysis of accurate whole-of-government data on energy and water use. This will provide a basis for future reporting as well as an opportunity for facility managers across the government to more actively monitor energy usage and identify opportunities to implement energy efficiency measures.

The government is committed to continuous improvement in environmental performance. Implementing greenhouse gas reduction measures will focus on avoiding and reducing emissions from government in the first instance, as well as subsequently switching to lower emission energy sources and undertaking carbon sequestration, consistent with the ACT Carbon Offsets Policy set out in Appendix A.

With the cost of energy forecast to rise significantly over the next 10 years, there is a strong case for energy efficiency investments to be a core part of the government's efforts to 2020. There are significant opportunities to mitigate rising energy costs, through investments in energy efficiency and organisational capacity building.

## New funding for an energy efficient government

The Environment and Sustainable Development Directorate manages a loan facility (currently known as the Resource Management Fund) to which Directorates may apply for a loan to fund energy efficiency projects. The Fund operates by allowing interest free loan funding to ACT Government Directorates, with the loan repaid from energy savings over an agreed period of time.

To date, the Fund has funded ten projects that have demonstrated real cost and energy savings. For example, with a loan of \$178,000 the 2011 lighting replacement program at Dame Pattie Menzies House resulted in 30% energy savings with a payback period of 1.5 years.

The 2012-13 ACT Budget provides an increase in the loan funding available to Directorates with the specific creation of a \$5 million Carbon Neutral Government Fund. It is anticipated that the Resource Management Fund and the new Carbon Neutral Government Fund will align to provide Directorates with access to a total pool of \$6.9 million in loan funds for energy savings projects. As part of developing the Carbon Neutral Framework, the ACT Government is assessing the option of temporarily reallocating the majority of GreenPower purchase budget to implementing energy efficiency measures in government sites to 2020. This will be reviewed in 2016 as part of the Carbon Neutral Framework review.



The ACT Government has developed the ACT Carbon Offsets Policy (Appendix A) which will guide how carbon offsets can be used to meet ACT emission reduction targets. Carbon offsets will be used by government as a last resort, following the implementation of cost-effective energy efficiency and renewable energy initiatives.

### **Financial opportunities for energy efficiency in government**

In addition to loan funding available within government, there are opportunities nationally to source funding to increase the government's energy efficiency and reduce greenhouse gas emissions.

In June 2012 it was announced that the Community Services Directorate, in collaboration with the Environment and Sustainable Development Directorate, was successful in gaining \$3.2 million in Australian Government *Community Energy Efficiency Program* funding for the 'ACT Community Facilities Go Energy Smart' project. The project funding will be used to deliver energy efficient lighting, lighting control systems, mechanical upgrades and smart energy management across 12 community hubs and facilities in Canberra over four years.

The project aims to decrease the overall energy use at the community facilities, making it cheaper to run the buildings and providing a better environment for the community organisations that occupy them, as well as their clients and the general public. The project anticipates that electricity use can be reduced by between 30–70% and gas use by 60–80% at the project sites as a result of the funded measures.

The project sites include the community hubs at Chifley, Cook, Holt and Weston as well as the Griffin Centre, Majura Community Centre and Southside Community Centre.

The project relied on matching capital works funds and an ACT Government Resource Management Fund loan of \$843,513, annual sub metering and data provision through the Sustainability Data Management System. It will be a great example of collaboration across government on the path to carbon neutrality by 2020.



# 6.

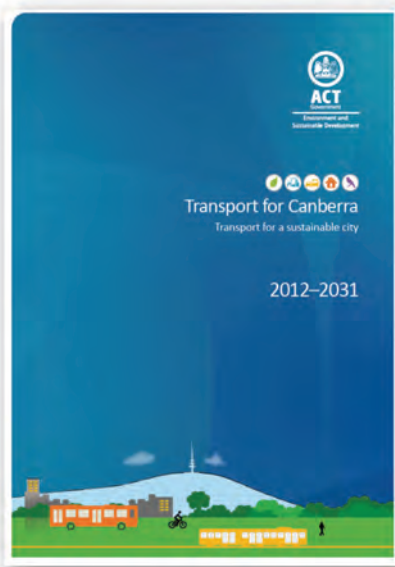
## REDUCING TRANSPORT SECTOR EMISSIONS





Transport for Canberra is the ACT Government's comprehensive policy for transport in the ACT – providing the foundation for transport planning for the next 20 years. It updates and replaces the *2004 Sustainable Transport Plan*, and has been prepared in conjunction with the ACT Planning Strategy, ensuring important relationships between land use and transport can be used to support a shift to more sustainable transport options. As Canberra grows and changes, Transport for Canberra will help us to reduce traffic congestion and greenhouse gas emissions while increasing the number of people using active travel and public transport.

**Figure 20: Transport for Canberra 2012-2031 was released in March 2012**  
**([www.transport.act.gov.au/policy.html](http://www.transport.act.gov.au/policy.html))**



This section provides a summary of the Transport for Canberra policy in relation to its contribution to meet our 2020 greenhouse gas emission reduction targets.

## Business as usual projections

Despite significant variation in ACT transport emissions from one year to the next, the long term trend in this sector has been one of steady growth, growing 15% from 2000 to 2011 which is higher than the population growth over that period.

Business as usual projections developed for Draft AP2 have been updated with fuel sales data from 2011 and now show a moderating of emissions growth to 2020, driven primarily by the continued trend towards smaller passenger vehicles offsetting expected population growth over the period. This is consistent with national projections.<sup>13</sup>

AP2 targets annual emission reductions of 138,000 tonnes from business as usual emissions in 2020 through a range of measures set out in the Transport for Canberra policy.

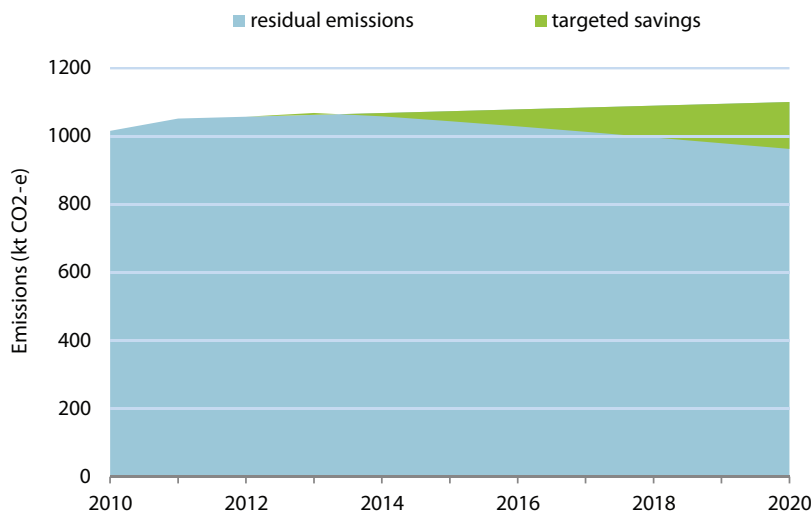
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<sup>13</sup> SKM MMA (2011) Australian Transport Emissions Projections to 2050





**Figure 21: Potential reductions in transport sector emissions under AP2**



### Australia's transport sector emissions

Within Australia's road transport sector, the largest contribution to emissions is made by passenger vehicles, accounting for 60% of road sector emissions in 2007-08. Growth in emissions from this sector has averaged around 1.2% p.a. since 1990, in comparison to around 2.4% on average from commercial vehicles, indicating that the fastest growth has been in the commercial fleet. The energy intensity of passenger vehicles has also dropped sharply over this time, from around 4.16 MJ/kilometre in 1990, to around 3.7 MJ/kilometre in 2008, implying that the growth in emissions has come from a growth in kilometres travelled, rather than from reduced fuel efficiency.

Recent figures from the Australian Transport Council also confirm this trend towards smaller, lower emissions vehicles. In 2011, the national average carbon emissions from new passenger and light commercial vehicles was 206.6 g/km. This is a 2.8% reduction from 2010. If Australians had purchased new vehicles with best-in-class emissions during 2011, the national average would be 128 g/km (38% lower).

Changes in fuel efficiency are likely to have occurred as a result of improving vehicle technology, trends towards purchases of smaller vehicles, and trends towards diesel technology in preference to petrol technology in passenger vehicles. This has been counteracted to some extent by increasing congestion, which has been estimated to have an impact of around 0.3% p.a., and growth in kilometres travelled, to which future increases are expected to arise from changes in population levels, since kilometres travelled per person has stabilised, and in some cases dropped, since 2004.

*Sources:*

SKM MMA (2011) *Australian Transport Emissions Projections to 2050*

NTC Australia (2012) *Carbon Dioxide Emissions from New Australian Vehicles*

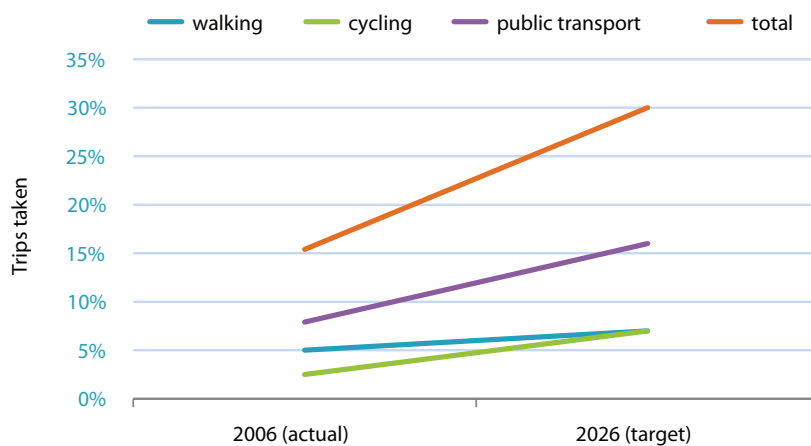


## How Transport for Canberra will reduce greenhouse gas emissions

Transport for Canberra will contribute to transport sector emission reductions in 2 ways:

- **Mode shifting**– Mode shifting reduces emissions from the transport sector through influencing vehicle demand, for example shifting to more sustainable modes of transport (public transport, cycling and walking), and increasing the number of people per vehicle. At the heart of Transport for Canberra is the target of doubling ‘active’ transport and public transport trips from 2006 to 2026 through a more compact urban form and investments in transport services and infrastructure.

**Figure 22 Targets for public transport and active transport trips**



- **Increasing vehicle fleet efficiency** – A key outcome of Transport for Canberra will be the development of a Low-Emissions Vehicle (LEV) Strategy, which will build on the ACT’s leading Green Vehicle Duty Scheme to encourage the uptake of low emission vehicles, including efficient petrol, electric and hybrid electric vehicles.

### Green Vehicle Duty Scheme

The ACT Government was the first jurisdiction in Australia to introduce differential stamp duty costs to provide an incentive for the purchase of low emission vehicles and a disincentive against the purchase of vehicles with poor environmental performance. The Green Vehicle Duty Scheme (GVDS) prices stamp duty according to a combination of greenhouse gas and particulate emissions, recorded objectively on the Commonwealth Green Vehicle Guide. The scheme is revenue neutral, with the best environmentally performing vehicles attracting a discount (or paying no duty), and the worst environmentally performing vehicles paying higher duty rates.

Over the period since the GVDS was introduced in late 2008 until mid 2011:

- The proportion of A rated vehicles sold has increased from approximately 2% of new car sales to approximately 7% of new car sales
- The proportion of B rated vehicles sold has increased from approximately 9% of new car sales to approximately 27% of new car sales
- The proportion of C rated vehicles sold has decreased from approximately 75% of new car sales to approximately 54% of new car sales, and
- The proportion of D rated vehicles sold has remained relatively constant at approximately 12-14% of new car sales throughout the period.

The Green Vehicles Duty Scheme was initiated as an action under *Weathering the Change: Action Plan 1*.

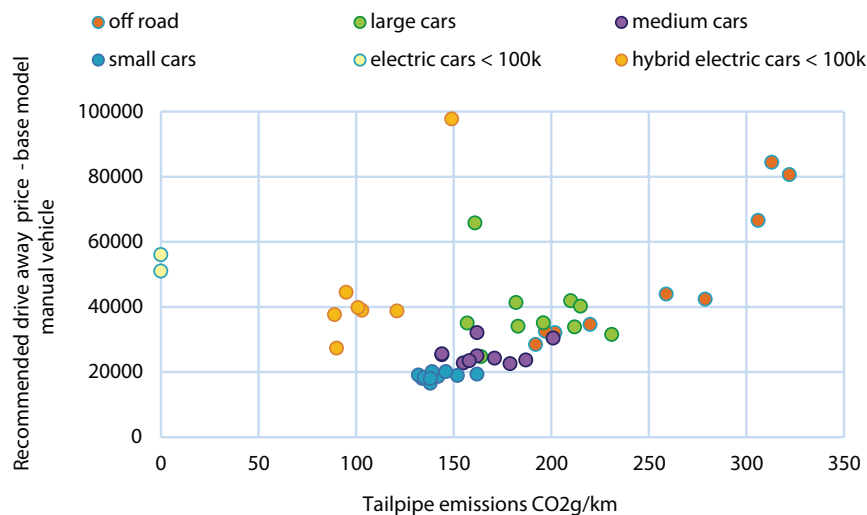


Significant emissions and cost savings are associated with the move to fuel efficient vehicles. Figure 23 shows the recommended drive away price in the ACT for the top selling petrol vehicles in their class in Australia, together with hybrid and electric vehicles, and details their CO<sub>2</sub> emissions. The figure shows that there are a number of lower cost petrol vehicles currently available in the Australian market which have relatively lower tailpipe emissions.

The figure also shows that, within a vehicle category, the selection of a best in class vehicle can result in a substantial reduction in CO<sub>2</sub> emissions at the tailpipe.

The average age of a motor vehicle in the ACT has remained constant (2003-2011) at approximately eight years old. This means that by 2020, approximately 50% of the fleet will have turned over, creating significant opportunities for lower emission choices.

**Figure 23: Prices and CO<sub>2</sub> emissions of Australia's top selling cars**



Source: Tailpipe emissions from Australian Government Green Vehicle Guide, Drive away prices from a popular online car sales website (June 2012).

## Support for electric vehicles

Electric vehicles are an emerging technology and are expected to increase in importance in reducing greenhouse gas emissions in the future, as their numbers increase along with the development of supportive infrastructure such as charging stations and battery technology. When powered from 100% GreenPower, electric vehicle emissions are eliminated and fuel costs, when compared to fossil fuels, remain low. These vehicles are expected to make up an increasing portion of the vehicle fleet to 2020.

The ACT Government supports the use of electric vehicles and other low emissions options through lower stamp duty rates for low-emission vehicles, registration discounts for electric vehicles, and enabling location of infrastructure. The government is also looking at the impact of more electric vehicles on the ACT's electricity infrastructure, and is considering steps to ensure that the use of electric vehicles results in fewer greenhouse gas emissions than vehicles with internal combustion engines.

The ACT Government will continue to work to streamline the processes for the approval of vehicle charging stations and to clarify any other planning or regulatory issues that might further enable the expansion of the ACT electric vehicle fleet, including in the ACT Government fleet. The government will consider issues including location and safety of charging points, the re-use and eventual disposal of batteries, and working with other governments to introduce workable national standards.

**Action 10:** The ACT Government will implement the *Transport for Canberra policy*, and develop a Low Emissions Vehicle Strategy.



# 7.

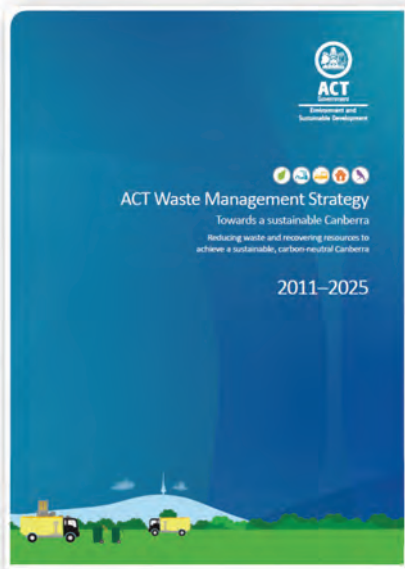
## REDUCING WASTE SECTOR EMISSIONS





The ACT Waste Management Strategy 2011–2025 sets a clear direction for the management of waste in the Territory towards 2025. It builds on the success of the No Waste by 2010 Strategy released in 1996 that successfully reduced the waste sent to landfill from nearly 60% of total waste in 1995–96 to below 30% by 2003–04. The Strategy covers waste from the household, commercial and industrial, construction and demolition sectors and biomass from wood and garden waste.

**Figure 24: The ACT Waste Management Strategy 2011-2025 was released in December 2011 ([www.environment.act.gov.au/waste](http://www.environment.act.gov.au/waste))**



The goal of the ACT Waste Management Strategy 2011–2025 is to ensure that the ACT leads innovation to achieve full resource recovery and a carbon neutral waste sector. This goal is supported by four key outcomes and 29 identified strategies that will enable the achievement of these outcomes.

The objectives of the Waste Strategy are:

- Outcome 1: Less waste generated
- Outcome 2: Full resource recovery
- Outcome 3: A clean environment
- Outcome 4: A carbon neutral waste sector

This section provides a summary of the scope of opportunity and challenges in our waste sector, and outlines key actions the government will undertake to reduce emissions under AP2.

## **Business as usual projections**

Emissions from the waste sector are primarily caused by the anaerobic decomposition of organic material sent to landfill. This leads to the release of methane, a greenhouse gas with a global warming potential around 21 times that of carbon dioxide. While a significant portion of the methane is captured and used for renewable power generation at Mugga Lane and Belconnen landfills, a proportion is inevitably lost, constituting around 3% of the Territory's greenhouse gas emissions.

Analysis undertaken for the ACT Waste Management Strategy indicates that waste emissions should decline under business as usual conditions, driven by the increased recovery rates of commercial sector waste.



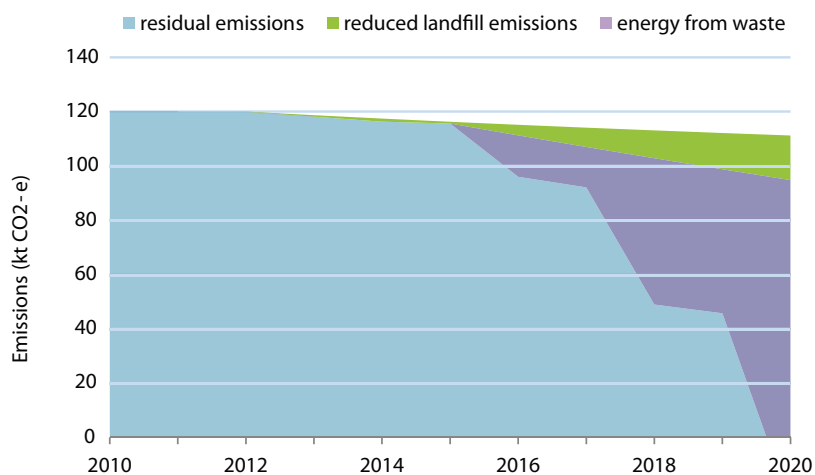
The commercial sector, including government agencies, schools, retailers, businesses, offices and restaurants, sent approximately 103,000 tonnes of waste to landfill in 2009–10. Unlike households which receive a government collection service, businesses are responsible for arranging their own waste and recycling services through commercial providers. There are several commercial and industrial service providers operating in the ACT. In using these services some ACT businesses separate and recover dry recyclables such as paper and cardboard.

Increased uptake of the ACTSmart Business and ACTSmart Office recycling programs along with the construction and operation of a new mixed-commercial waste Material Recovery Facility (commercial MRF) from 2014 are expected to significantly increase resource recovery from this sector. The new commercial MRF is planned to recover over 40,000 tonnes of material a year that would otherwise have been landfilled. Much of this material will be organics such as paper, timber and cardboard. The commercial MRF is expected to be operational in 2014. This is estimated to reduce emissions by around 9000 tonnes per annum, by 2020, and reductions will grow over time as emissions from legacy waste diminish.

### New emission reduction measures

Implementation of the waste strategy is expected to reduce landfill emissions by a further 16,000 tonnes CO<sub>2</sub>-e per annum by 2020 through waste avoidance and increased resource recovery. Figure 25 shows this reduction (in green) from the business as usual forecast. Also shown is the potential offered by energy-from-waste to offset waste sector emissions, achieving carbon neutrality for the sector in 2019. For the purposes of AP2, the deployment of energy-from-waste technologies is counted in the section *Transitioning to large-scale renewable energy* (from page 67) rather than as a reduction within the waste sector itself.

**Figure 25: Potential reductions in waste sector emissions from the ACT Waste Management Strategy**



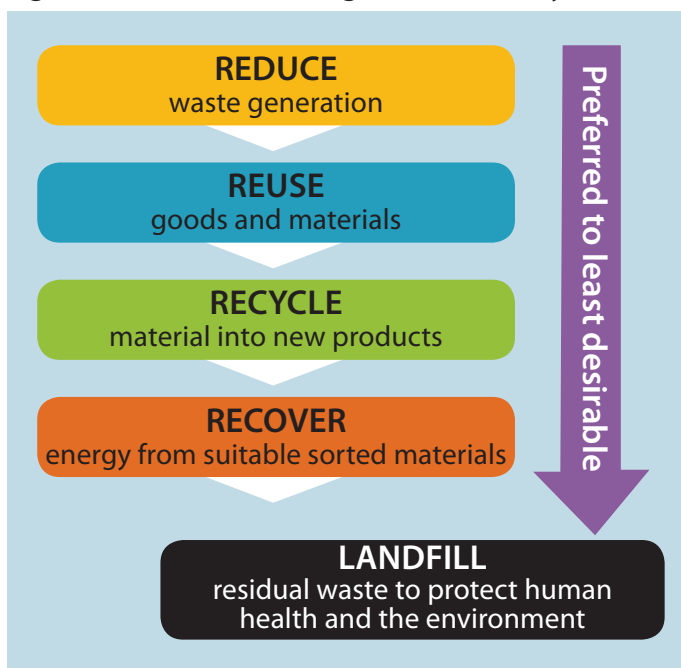


## How the ACT Waste Management Strategy will reduce greenhouse gas emissions

The ACT Waste Management Strategy adopts the waste management hierarchy which aims to extract the maximum practical benefits from products while generating the minimum amount of waste. The hierarchy employs strategies which aim to:

1. avoid products becoming waste (reduce and reuse)
2. find an alternative use for waste (recycle and recover), and
3. ensure safe and appropriate disposal as a last resort.

**Figure 26: The waste management hierarchy**



Avoiding or minimising the generation of waste means less waste to manage. This in turn leads to reduced costs associated with transporting, sorting and recycling materials and ultimately less waste sent to landfill and lower greenhouse gas emissions.

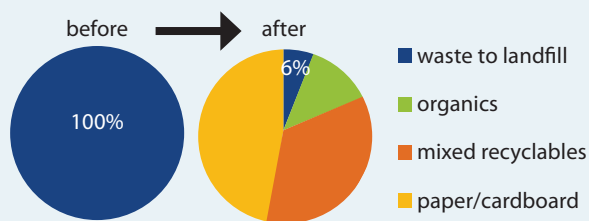




## ACTSmart case study

Canberra CBD Limited, a not-for-profit company formed in 2007-08, is responsible for improving and marketing the City Centre as a pre-eminent retail, lifestyle and commercial precinct in the ACT.

After signing up to the program in August 2009, the ACTSmart Office team visited Canberra CBD to explain the program and deliver the Best Practice Guide. The team provided advice on the best way to set up the program and assisted with their first waste audit. In November, the ACTSmart Office team visited the Canberra CBD for ACTSmart Office assessment.



With all systems in place, and a reduction of waste to landfill by around 94%, Canberra CBD was awarded accreditation under the ACTSmart Office program.

The ACTSmart Office program is a great example of how changes in everyday behaviours can greatly reduce our ecological footprint.

The following ACT Government strategies will underpin improved resource management and reduce emissions from ACT landfills into the future:

- **awareness, education and action** – This aims to integrate complementary education, training and initiatives targeting industry and households, as well as within schools and training institutes.
- **support for community gardens and home composting** – Community and home gardens also provide an excellent opportunity for householders to reduce waste by composting household organic materials and produce some of their own food, reducing emissions associated with the packaging and transport of food products.
- **promote reuse through ACT businesses and charities**
- **encourage on-site reuse of construction and demolition waste** – The vast majority of waste generated by the construction and demolition industry can be readily re-used and recycled.
- **boost commercial waste recycling** – Just under 50% of waste sent to landfill comes from the commercial sector with 30 to 40% of this waste being readily recyclable glass, metals, plastics and paper. The Strategy aims to increase the ACT rate of resource recovery from over 70% to over 80% by redirecting readily recyclable waste from landfill to recycling markets.
- **recover organic waste sent to landfill** – Around 50% of waste sent to landfill is organic, made up of food, timber, paper and garden wastes. Organic waste comes from all waste sectors-household, commercial and construction and demolition. A Material Recovery Facility for residual waste (residual MRF) could recover nearly all of the organic material currently sent to landfill from households as well as mixed wastes from the commercial sector that are too wet or contaminated to be processed in the new commercial MRF.

These and other government initiatives are discussed in detail in the ACT Waste Management Strategy located at [www.environment.act.gov.au/waste](http://www.environment.act.gov.au/waste)



## Biochar in the ACT

Pyrolysis offers the potential to process urban waste streams into value added products namely biochar and syngas. Biochar is a stable form of carbon that may generate carbon offsets under the Commonwealth's Carbon Farming Initiative (CFI). Syngas can be burnt to create heat and power or upgraded into a transport fuel. Hence, pyrolysis is one of the few processes that can simultaneously sequester carbon and generate renewable energy.

Biochar may have significant value in agriculture. The sale of such biochar made from waste materials could improve the economics of material recovery facilities (MRFs) in the ACT.

The ACT Government contracted AnthroTerra in January 2011 to make five agronomic biochars from blends of ACT wastes including:

- garden waste
- urban forests
- construction & demolition wood waste
- biosolids (sewage solids) and
- residual-waste organics.



In 2011–12 the ANU Fenner School of Environment and Society used these biochars in pot trials to determine the impact on soil chemistry, physical properties and plant yield. Some of the biochar blends significantly enhanced the properties of soils or composts at addition rates as low as 0.5-6%.

*Biochar researchers and project stakeholders.*

*Photo source: ANU Fenner School, 2011*

**Action 11:** The ACT Government will implement the *ACT Waste Management Strategy 2011–2025* and achieve a carbon neutral waste sector by 2020.

# 8.

## TRANSITIONING TO LARGE-SCALE RENEWABLE ENERGY





Community consultation on Draft AP2 demonstrated overwhelming community support for the rapid adoption of renewable energy sources, through the deployment of small to large-scale generation technologies.

The shift from fossil fuel based generation to large-scale renewable energy generation is a major focus of AP2, accounting for around 72% of potential emission reduction effort in 2020. This section provides a summary of the approach of AP2 to reducing emissions from our electricity generation sector through increasing investment in renewable energy.

## Business as usual projections

The ACT is the only jurisdiction to account for electricity imports (scope 2 emissions) in its greenhouse gas inventory. This is primarily because we import virtually all of our electricity from the National Electricity Market, and electricity is our single biggest emissions source, accounting for around a 63% of total emissions in 2009. While this inclusion greatly increases our reportable emissions it also provides an opportunity to cut our emissions by transitioning to renewable energy sources.

The ACT has a strong tradition of supporting renewable energy as the Australia's largest per-capita purchaser of GreenPower and through our uptake of rooftop solar under the small and medium feed-in tariff schemes. The ACT is also supported by the Australian Government Large-scale Renewable Energy Target (LRET) of 20% renewables by 2020 which is funded by ACT users through our electricity bills.

The Kamberra Winery building in Lyneham is home to one of the ACT's largest PV solar panel installation to date. The 146 kilowatt installation was connected to the ACT electricity network on 1 June 2012 and represents the first installation to be completed under the ACT's medium-scale feed-in tariff scheme.

*Photo source: SREC, 2012*

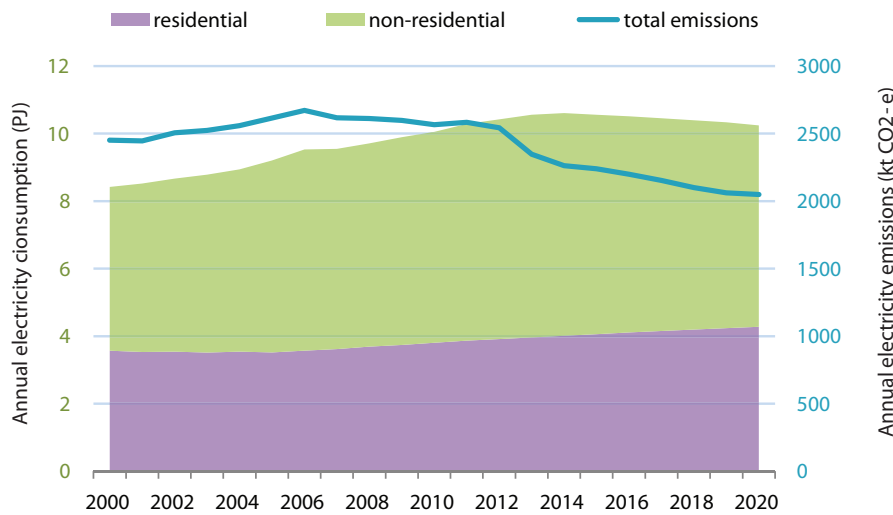


GreenPower usage and existing and new small-scale rooftop solar is factored into business as usual projections for the ACT, with strong continued growth in rooftop solar forecast out to 2020 as shown in Figure 18.

LRET and the national price on carbon is forecast to have a substantial impact on the emissions intensity of our electricity imports from the National Electricity Market (NEM) and the Territory's overall emissions from that source. As shown in Figure 27 below, while electricity consumption is expected to grow from current levels under business as usual conditions, emissions are expected to reduce as a result of LRET, the national price on carbon, as well as increased uptake of small and medium-scale rooftop solar. Forecasts for the uptake of rooftop solar are set out in Figure 18 on page 38.



**Figure 27: Historical and forecast electricity consumption and emissions without AP2**



## Renewable electricity prices

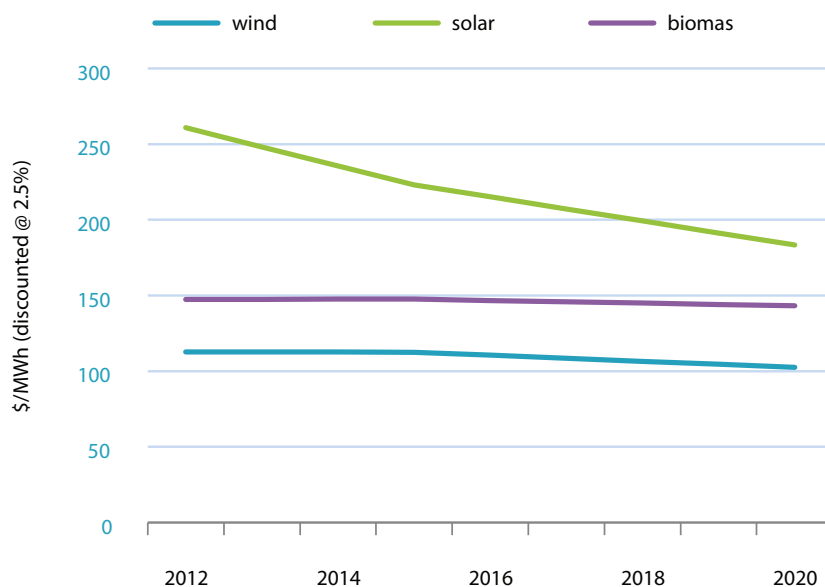
Increasing our use of renewable energy comes at a cost to the Territory. The NEM is designed to ensure the lowest cost mix of electricity is used. This means that renewable energy producers such as large-scale wind and solar generators, who typically have higher capital costs, require a subsidy to enable them to participate in the market, even though their running costs are typically much lower.

The cost of generating electricity for a particular technology or generator is sometimes referred to as its levelised cost of energy (LCOE). This is capital, operating, finance costs and margins for the generator divided by the total expected output, or, basically, the price the generator needs to get for each unit of production to be economic.

While electricity prices are going up, the cost of generating electricity from renewable energy sources is coming down. Figure 28 shows a modelled average LCOE forecast for wind, solar and biomass generators in NSW in real terms (discounted for inflation). These three energy sources are in relative abundance in our region, providing the Territory with the opportunity to pursue local renewables at a declining cost over time.

Proposals put forward in the fast-track stream of the government's solar auction process show that large-scale solar costs approximate, or are potentially less than, those modelled under AP2.

**Figure 28: Levelised cost of energy for selected renewable energy sources (2012 to 2020)**



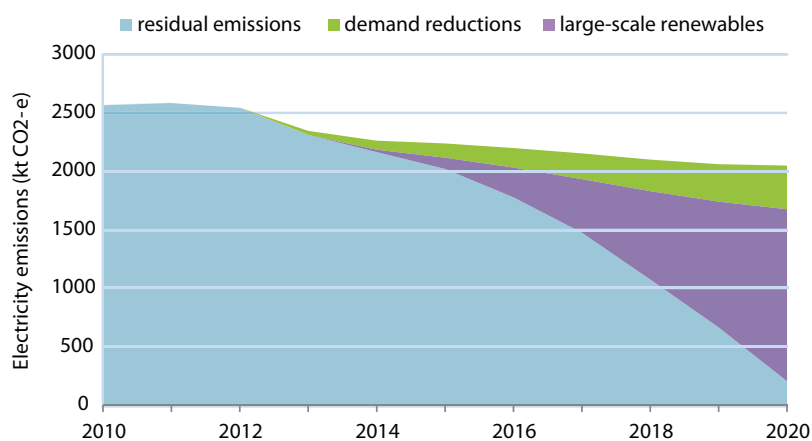
Source: Bloomberg  
New Energy Finance,  
April 2012



## Investing in large-scale renewable energy

AP2 prioritises reductions in electricity consumption over renewable energy purchases. However, after targeted energy savings measures have been accounted for, large reductions in electricity emissions are still required. Figure 29 below shows that an 86% reduction from business as usual associated electricity emissions is required to meet our target. This consists of an 18% reduction from reduction in demand for electricity and around a 68% reduction from the purchases of renewable energy.

**Figure 29: Potential reductions in electricity sector emissions from demand reductions and large-scale renewable energy purchases under AP2**



To achieve the reductions required through renewable energy purchases, the Territory will prioritise large-scale renewable energy generation in the ACT and our region with the following benefits:

- **lower costs** – Large-scale renewable energy generation has economies of scale bringing down generation costs.
- **local employment benefits** – Encouraging investment in the ACT and the surrounding region means we will be able to capture the benefits of development including construction phase jobs and ongoing operation and maintenance. This is also consistent with the ACT Government's vision for the region to be a renewable energy innovation and employment hub.
- **environmental additionality** – Pursuing large-scale renewables, and voluntarily surrendering Large-scale Generation Certificates (LGCs) under the national renewable energy target legislation, means that the renewable energy generation can result in abatement above and beyond national carbon pollution cap (see *Creating additional emission reductions* on page 10).

### The ACT's Large-scale renewable energy legislation

Under the *ACT Electricity Feed-in (Large-scale Renewable Energy) Act 2011*, renewable energy generators are granted, through a competitive process, a feed-in tariff comparable to their LCOE less the wholesale market value of the electricity they produce. This innovative approach, the first of its kind in Australia, will ensure that the Territory pays the lowest possible cost for energy and that those costs decline overtime as wholesale energy prices increase. LGCs can also be voluntarily surrendered to create additional greenhouse gas reductions.



## 40MW Solar Auction

The ACT Government's large-scale solar auction is an innovative policy that will result in up to 40 megawatts of large-scale solar energy generation capacity for the Territory, providing around 2% of our electricity needs. The competitive process, and 'contract for difference' model will ensure that this is delivered to the Territory at the lowest possible price.

Adopting a contract for difference model means the Territory will only pay the difference between the project LCOE and the wholesale of the electricity produced. The Territory's payments will decline over time as wholesale prices increase.

The auction has generated strong interest from proponents nationally and internationally, with 22 of 49 proposals received shortlisted to participate. The auction process will conclude in early 2013.

Because of these advantages, a large-scale feed-in tariff model has been used as the basis for costing large-scale renewable energy generation investment under AP2. However, whether to use feed-in tariffs, or other methods for facilitating investment in renewable energy, will be decided following an evaluation of the solar auction process to be conducted in 2013.

**Action 12:** The ACT Government will, subject to an evaluation of the 40 megawatt solar auction and ongoing policy review, develop large-scale renewable energy generation capacity for the purposes of reducing emissions from electricity use and achieving our 2020 emissions reduction targets.

## A portfolio approach to large-scale renewable energy development

AP2 proposes a portfolio approach to large-scale renewables meaning it will seek a blend of sources rather than only pursuing, for example, only solar or only wind. This will create a smoother generation profile, better matched to our demand for electricity from the NEM. For example solar energy peaks during the day and can contribute significantly to summer peaks in demand. Wind generation tends to peak in the morning and evenings, best matching winter peaks.

Support for wind farms in the NSW/ACT Border Region

- 89% support wind in NSW
- 84% support within 10km
- 61% support within 1–2km

Status of projects as at 2010

- 145.8 MV installed
- 579 MV approved
- 1072 MV under assessment

Source: Department of Climate Change and Water NSW [2010] Community Attitudes to wind farms and renewable energy in NSW





A portfolio approach also makes the best use of our available renewable energy resources while balancing costs and our priority to encourage local investment. The following renewable energy capacity has been identified in AP2 in the ACT and surrounding region:

- **solar** – While the ACT has abundant solar resources, there are constraints on our network that are expected to limit the penetration of solar energy to between 130 to 160 megawatts of installed capacity by 2020.
- **biomass** – The ACT Waste Management Strategy has identified the potential for around 23 megawatts of biomass generation capacity in the ACT based on residual organic waste streams in the Territory that are currently landfilled. Taking a regional approach to biomass greatly increases this potential and the ACT Government is currently exploring opportunities in our region, working with Enterprise Connect and Regional Development Australia.
- **wind** – The ACT/NSW border region has some of Australia best untapped wind resources, with over 1500MW of capacity currently approved, under assessment or under development in 2010. This is in addition to significant existing installed capacity in the region. Although the best wind resources are outside the ACT’s borders, buying and surrendering Large-scale Generation Certificates is a way of having wind generation counted against the ACT’s greenhouse gas emissions inventory.

AP2 targets these energy sources, using the portfolio blend as shown in Table 7. This will be subject to active monitoring of changes in technology to 2020 consistent with the ACT Government’s adaptive management approach to AP2 implementation.

One of the benefits of the ACT’s approach to investing in large-scale renewables, through a competitive auction process, is control over the timing of investment and the type of technologies deployed. For example advances in technology or cost breakthroughs, such as in relation to solar thermal power generation, or geothermal energy, can be responded to and the portfolio strategy adjusted accordingly.

**Table 7: Breakdown of targeted renewable energy generation sources in 2020 including installed capacity, annual generation and greenhouse gas abatement**

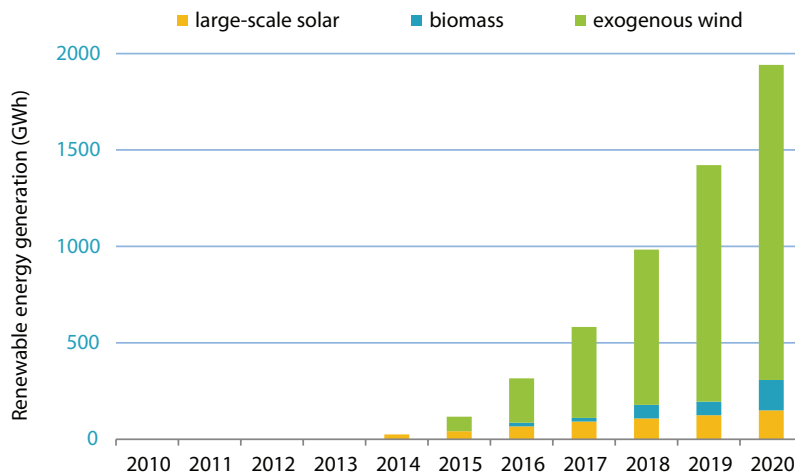
Source	Installed capacity (MW)	Annual generation (GWh)	GHG abatement (ktCO <sub>2</sub> -e)
solar	90	150	114
biomass	23	158	120
wind	583	1633	1238

Figure 30 shows a potential scenario for the build up of renewable energy generation up to 2020 under AP2 and outlines a steady rate of growth from the first deployment of large-scale solar, from as early as 2014. The 90 megawatts of large-scale solar in 2020 is in addition to an estimated 72 megawatts of small and medium scale rooftop solar expected in that year.





**Figure 30: The potential build-up of renewable energy generation proposed under AP2.**



## A new renewable energy target

In 2011, the ACT Government established a renewable energy consumption target for the Territory, under the *Climate Change and Greenhouse Gas Reduction Act 2010* of 15% by 2012 and 25% by 2020. At the time of setting these targets the government indicated that targets would be updated with the release of AP2.

Accounting for renewable energy usage is complex and a range of different methods are possible.

The electricity we import from the National Electricity Market (NEM) has a substantial and growing renewable energy component, driven by the large-scale renewable energy target. The ACT community contributes to the cost of this renewable energy through our electricity bills. In addition, customers in the GreenPower scheme pay extra to ensure that their electricity consumption is offset by additional renewable energy generation in the NEM.

In accounting for our renewable energy, the ACT Government set out that it would include renewable energy from the NEM as well as GreenPower and rooftop solar generation. This was based on the principle of 'financial responsibility', that is – the ACT community is entitled to account for these sources on a proportional basis as we pay the cost premium required for these generation sources to be deployed. Without the ACT's community's financial support, a proportional reduction in renewable energy production would occur in the NEM.

The ACT greenhouse gas inventory accounts for this renewable energy in two ways. Firstly, renewable energy in the NEM decreases the emissions intensity of the electricity we are supplied and therefore our overall emissions.

Secondly, GreenPower is counted as emissions-free electricity and subtracted from total electricity imports before calculating our electricity emissions. The Territory's generation from large-scale renewables will be counted as Government Accredited GreenPower due to the voluntary surrender of LGCs. The process to establish this is being developed by the National GreenPower Steering Committee. As discussed in previous sections, this is necessary to ensure that it results in emission reductions above and beyond the national pollution cap.

This approach is proposed to be continued under AP2 for the purposes of accounting for our emissions and our performance against our emission reduction targets with LRET and GreenPower contributions already accounted for in business as usual projections.

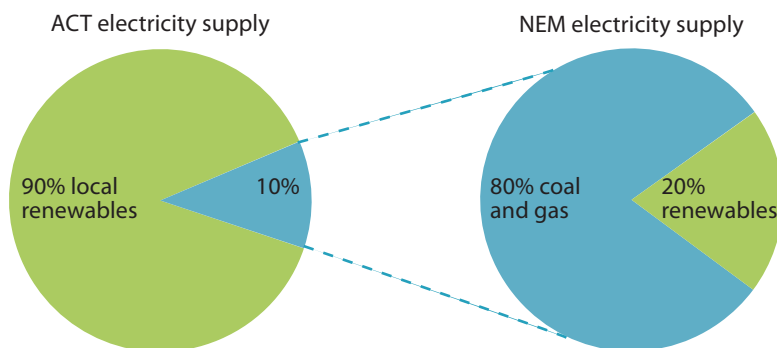


AP2 proposes a new renewable target for 2020, and a new methodology for measuring renewable energy usage. This target will be reviewed in line with AP2 over the period to 2020.

In order to meet our 2020 greenhouse gas reduction objectives, the government estimates that we will need to displace around 90% of total electricity demand from the NEM with emissions-free renewable energy. This includes a contribution of 7% from rooftop solar and GreenPower purchases. This amount will be periodically reviewed in light of the extent to which the Territory is able to achieve lower cost abatement, such as through energy efficiency or through transport and waste management.

Under AP2 the ACT Government will cease counting renewable energy generation under the national Large-scale Renewable Energy Target towards our target, as continuing to do so would misrepresent the contribution of national renewables to our electricity blend. As shown in Figure 31, after meeting 90% of our electricity consumption needs through local and regional renewable energy investments, the proportion of renewables in the NEM would only count as a fraction of 10% of our energy consumption. Renewable energy generation will still be counted in relation to determining the grid intensity of our import of blended electricity from the NEM.

**Figure 31: Indicative contribution of national renewable energy to the ACT’s electricity consumption in 2020**



**Action 13:** The ACT Government will determine a new renewable electricity consumption target of 90% renewables by 2020 based on the strategic pathway set out in AP2 and in 2013 publish a methodology for accounting for renewable energy consumption and reporting against this target.

### Mapping the renewables potential of our network

A key barrier to the deployment of renewable energy technologies in the ACT is a lack of information in the public domain, on our distribution networks capacity to absorb additional generational capacity. Some small parts of the ACT network have already reached their capacity to absorb additional generation, however other parts of the network have the capacity to absorb a great deal more.

Providing information to the public on which areas of the network have additional capacity will improve the efficiency of investment and help developers, particularly in the commercials sector assess the technical potential for integrating renewables into their designs, prior to undertaking more detailed network technical studies.

This information may be overlaid with renewable energy resource availability or information on precinct heating and cooling loads developed under Action 9 (page 52).

**Action 14:** The ACT Government will develop detailed mapping of the ACT electricity distribution network providing up-to-date information on the capacity of feeders and substations to absorb additional renewable energy generation.

# 9.

## DEVELOPMENT OF A CLEAN ECONOMY





Climate change and an increased focus on renewable, energy-efficient and low-emission energy technologies will create significant opportunities for the development of new businesses and industries and associated employment prospects within the Territory and surrounding region.

The emerging clean economy, which is being driven by both national and local policies and programs around climate change, offers major opportunities for enterprise development and economic diversification. Canberra's knowledge economy which is underpinned by a strong research sector, innovation, investment and entrepreneurialism is well positioned to realise these opportunities.

Based on a 90% renewable energy target, AP2 would unlock around \$1.7 billion in private investment in local renewable energy projects by 2020 which will create a wide range of employment benefits for the ACT and region. The Australian Capital Region will become a hub for renewable energy. Energy efficiency measures will deliver net savings while also supporting jobs in construction, trade and retail, while building the skills and experience of trades people in the clean economy.

### **ANU Energy Change Institute**

ANU solar research is a major component of the ANU Energy Change Institute ([www.energy.anu.edu.au](http://www.energy.anu.edu.au)). The 80 staff and students research photovoltaic cells, solar thermal and combined heat and power systems. Active external contracts total \$50M including from the Australian Research Council, the Australian Solar Institute, Defence and other government Departments, and industry. There is a strong commercial focus, including startup companies and international industry partners. Solar technology created at ANU is the subject of dozens of patents, licensing agreements and production contracts that generate millions of dollars in annual revenue.



*Photo: ANU conducts state-of-the-art research in the field of laser processing for photovoltaics.*

*Source: ANU College of Engineering & Computer Science, 2012*

In concert with the Territory's broader sustainability agenda and business development program environment the government will provide new business opportunities to grow the clean economy by:

- providing a new funding stream for clean technology or sustainability oriented companies under Innovation Connect
- placing a new emphasis on private sector investment facilitation which will help ACT capability in clean technology to connect to financial flows and global capability, and
- providing additional funding under Innovation Connect for strategic opportunities to leverage new innovation infrastructure including in clean technology.

In addition, a range of existing ACT Government funded business programs are assisting the development and formation of new clean technology firms and also businesses with sustainability service business models. The Canberra BusinessPoint advisory and information service, the Lighthouse Business Innovation Centre, the Innovation Connect grants program, the Canberra Business Development Fund, ANU Connect Ventures and the Discovery Translation Fund are all providing support and stimulus to company formation and capability building in this area.



**Figure 32: ACT Business Development Strategy was released in May 2012 ([www.business.act.gov.au](http://www.business.act.gov.au))**



The Territory's aim is to harness knowledge to drive innovation and business growth, to ensure our business community is highly collaborative, connected and sustainable, and to make Canberra a preferred location for clean businesses to operate.

Key elements to developing a clean economy are:

- enhancing and leveraging research and development partnerships
- developing workforce skills to meet the needs of emerging clean industries
- promoting Canberra's locational advantages for the emerging clean technology sector, and
- supporting the growth of emerging and clean tech businesses.

The ACT Government will implement the Business Development Strategy to encourage new business opportunities in the clean economy.





# 10.

ADAPTING TO A CHANGING  
CLIMATE





While reducing our carbon footprint is the primary focus of AP2, the ACT also needs to prepare for some unavoidable changes in the climate.

Adapting to the impacts of climate change is about managing risk. Governments are primarily responsible for managing risks to public goods and assets and government service delivery. In addition, they create the right conditions and incentives for businesses and the community to make efficient investment decisions and manage the risks posed by the impacts of climate change. The adaptation challenge requires an informed risk management approach across many areas of government. Our objective is to embed climate change risks into standard risk management frameworks so that adaptation is something that is core business for the ACT.

Adaptation responses will even be required after carbon dioxide concentrations have stabilised because long lags in the climate system will result in continuing change. The value of taking action to adapt will increase with the degree of climate change.

Climate variable	Trend	Comment
Daily maximum temperature	↑	Average daytime temperatures in summer are likely to increase more than the daytime temperatures in winter
Daily minimum temperature	↑	More warm nights, with night-time temperatures in winter possibly increasing more than night-time temperatures in summer
Heatwaves	↑	The frequency of very hot days is likely to increase
Frost days	↓	The frequency of very cold days is likely to decrease
Relative humidity	↓	Likely to decrease in summer with a possible decrease in summer rainfall
Potential evaporation	↑	Likely to increase particularly in summer with a possible decrease in summer rainfall
Drought frequency and intensity	↑	Likely to increase with decreasing rainfall, increasing potential evaporation and increasing maximum temperature
Bushfire frequency and intensity	↑	Likely to increase with decreasing rainfall, decreasing humidity and increasing maximum temperature

There are potential limits to adaptation. That is, there are thresholds beyond which actions to adapt cease to reduce vulnerability. These include:

- ecological and physical thresholds, beyond which planned or unplanned responses fail to avoid climate change impacts (eg. beyond certain climatic thresholds, vegetation types such as alpine bogs may no longer be able to persist in the ACT)
- economic thresholds, where the cost of adaptation exceeds the cost of the impacts averted (that is, it is more expensive to adapt than it is to experience climate impacts), and
- technological thresholds, beyond which current available technologies cannot avoid climate impacts (eg. drainage systems are unable to deal with more extreme rainfall events and flooding, rendering some areas unsuitable for urban development).





## National Adaptation Policy

Adaptation policy at the national level is guided by the *National Climate Change Adaptation Framework* (NCCAF). The NCCAF is designed to support decision-makers to understand and incorporate climate change into policy and operational decisions at all scales and across all vulnerable sectors, and guide action by States and Territories over the next five to seven years. The Framework is structured around two key strategies:

- building understanding and adaptive capacity, and
- reducing sectoral and regional vulnerability.

## Information sharing and education

Successful climate change adaptation requires that we understand the climate impacts we are likely to face and their implications for our society, economy and the environment. The ACT Government will improve the quality of information for the ACT to increase understanding of potential impacts under climate change.

Through the NSW and ACT Regional Climate Model (NARClIM) initiative—a joint collaboration with the NSW Government and the University of NSW—the ACT Government will facilitate access to a standardised user friendly database. This database will contain the most up-to-date, comprehensive, reliable and finest resolution (space and time) climate change data and tools currently available for the ACT. This information will help the ACT Government to manage the risks associated with a changing climate.

The ACT Government is translating knowledge about the projected climate change, into policies with actions to mitigate the risks as well as ameliorate and/or adapt to the impacts on both people and our natural resources.

The ACT Government will look to improve provision of climate change information and data to stakeholders as part of the proposed community engagement strategy to be developed in early 2013 (see Action 5 on page 38).

## Australian Capital Region

The Australian Capital Region (ACR), comprising the 17 Local Government Areas (LGAs) plus the ACT, is commonly understood to be our region. However, the geographic extent of the region depends on the issue concerned. For example with education and health services, the region may extend further inland; for biodiversity, it may extend further north and south.

The ACT Government will commence and continue to make accessible, up-to-date knowledge on climate change trends in the ACT and immediate region, in forms suitable for use by government and the wider community.

## Community health and wellbeing

Climate change projections indicate that there will likely be significant impacts on public health in the ACT. Potential adverse effects on population health will arise from direct impacts, such as heat stress during heatwaves and sunburn, and indirect impacts, such as from food and waterborne diseases, increased allergens and deaths, injuries, mental trauma and population displacement as a result of natural disasters (fire, flood, drought, hail, storms) and extreme weather events.

The implications for the health of the population and for health services are extensive and it is anticipated that climate change will create increased demand for ACT primary care, mental health and emergency services – not only within the ACT, but also from the surrounding NSW region. Of particular concern are vulnerable populations, including the elderly and the very young, people of low socio-economic position and those with poor access to essential services.



The ACT's population health policy aims to improve the health status of our entire population by taking into account the various factors that influence health. This approach recognises that many of these factors are outside the direct control of the health system and relies on a strong commitment to practical partnerships between government and the community.

The ACT Health Directorate will lead the implementation of "Responding to the Health Impacts of Climate Change", Annexure 1 of *Towards A Healthier Australian Capital Territory- A Strategic Framework for Population Health Division 2010–15*. In implementing the Annexure, the Health Directorate will undertake strategies to ensure the ongoing development of population health policy takes into consideration climate change impacts, including through:

- monitoring the health impacts of climate change in the ACT
- accessing and engage in research that informs policy, and
- building community resilience to health impacts of climate, with a particular focus on vulnerable groups.

## Disaster and emergency management

A new Territory Wide Risk Assessment (TWRA) will prioritise natural disaster risk in accordance with relevant Australian Standards and support measures to strengthen communities, individuals, businesses and institutions to minimise the adverse effects of disasters, including the potential impacts of climate change.

The TWRA will define the range of natural and human caused hazards that may impact on the ACT and identifies a range of treatment and management options to safeguard against the risks presented by natural hazards.

**Action 15:** The ACT Government will assess the potential risks of climate change to community health, territory life and property including through acute weather and fire impacts in the ACT and the surrounding region through a new Territory Wide Risk Assessment and will integrate this knowledge into future health system planning and natural disaster and emergency risk management and planning.

## Urban planning

The physical infrastructure of the city and the suburbs, such as buildings, roads, bridges, stormwater and water catchment systems, are likely to be affected by climate change, especially by changed frequency and intensity of extreme weather events.

Planning decisions for the development and the replacement or refurbishment of long-lived infrastructure needs to take into account the potentially different future climate – including higher temperatures and the increased intensity and severity of rainfall and storm events.

In early 2012, the ACT Government released the *Climate Change Vulnerability Assessment Framework for Infrastructure* discussion paper. This framework acts as a tool to support the risk assessments of the vulnerability of our infrastructure and, subsequently, to inform the future management of this infrastructure. This facilitates risk assessment and accurate mapping of the city's physical infrastructure – including roads, stormwater, power and water supply systems. The tool also allows us to better understand the condition of our physical infrastructure – informing infrastructure planning and management of the city in times of disaster.

By focusing on where residential intensification and further commercial activity is appropriate along transport corridors and in urban centres, Canberra can substantially retain its suburban fabric, create more diverse urban environments and become a more efficient, compact city that is more sustainable, socially cohesive and economically resilient.

Within districts and suburbs, *Transport for Canberra and the ACT Planning Strategy* will aim to make active travel



(walking and cycling) easier travel options. These modes generate zero greenhouse gas emissions, and will also help more Canberrans become more active, meeting national physical activity guidelines and improving health outcomes. Our planning strategy identifies transformative projects for transport and urban form as well as opportunities to increase the deployment of renewable and distributed energy sources.

Significant work is currently underway across a broad range of planning areas to accommodate expected climate impacts into planning processes and tools:

- **Virtual ACT** – Virtual ACT is an initiative to improve access, display and analysis of government data based on location. It will integrate traditional mapping data with address based data, environmental data, planning information, demographics, etc to facilitate analysis including non-traditional applications such as health, education, planning, and sustainable development, and includes 3D visualisation. It will allow us to promote and recognise the value of trees, parks and waterways as ‘green infrastructure’ to improve biodiversity in our urban areas, amenity and liveability. Virtual ACT is being integrated with dataACT, the open government portal, to improve community interaction. A business case for the ongoing development of the two initiatives is being undertaken and due for completion before the end of 2012.
- **changes to the Building Code** – The ACT Government is currently exploring changes to the building code to accommodate future climate projections for the ACT in setting and assessing performance against building standards.
- **Territory Plan variations** – Territory Plan variations for new urban areas will be informed by analysis of current and future climate scenarios, considering the potential impact and risks associated with natural hazards (including bushfire and flooding). These considerations will be used to inform future variations to the Territory Plan, which may include land use determinations specifically to mitigate future and current risks.
- **development approvals** – The ACT Government is working towards ensuring that assessment of natural hazards (including bushfires and flooding) is required for new developments including consideration of long term climate analysis and findings. Prior to approval of development and where necessary, appropriate mitigation strategies will be required to be developed and implemented for new developments and development planning will continue to be referred to the ACT Emergency Services Agency for approval who will take these matters into consideration as part of the assessment process
- **urban waterways** – The use of lakes and ponds as an alternative supply of water for irrigation will be taken into consideration in the design of new water quality control ponds within the urban areas.

While significant work is underway, the government recognises the need to bring this work together in a transparent and useful form for all planning stakeholders. This will be achieved through the development of a *Ministerial Statement* to be tabled by the Minister for Environment and Sustainable Development by the end of 2013.

**Action 16:** By the end of 2013 the ACT Government will publish a Ministerial Statement on how, from a whole-of-government perspective, built environment and urban open spaces will be developed to respond to climate change and the ACT’s long term mitigation objectives. This will incorporate a review of the Territory Plan development codes and design standards.



## Water security

Climate change is expected to adversely affect the Territory's water security through an overall decrease in rainfall and an increased likelihood and intensity of drought events. An expected increase in daily maximum temperatures will also contribute to an increased potential for evaporation, further affecting water security.

The government will continue to work to increase the security of Canberra's urban water supply to meet the one in 20 year temporary water restrictions target and improve the health of ACT waterways by undertaking or supporting:

- an enlarged Cotter Dam by the end of 2012
- a Murrumbidgee to Googong Transfer Pipeline by August 2012
- commercial arrangements with Snowy Hydro Ltd and ACTEW to enable the transfer of water from Tantangara Dam by the end of August 2012
- completion of water trading arrangements to cover water transfers between the ACT and NSW by August 2012
- the purchase of water entitlements by ACTEW as additional water supplies for the ACT
- trialling the long term commercial feasibility of supplementing the urban water supply by constructing urban storm water ponds and using the water to replace potable water used for irrigation
- adoption of integrated water resource management and integrated catchment management principles, and
- promoting cost-effective recycling, water re-use and other ways to reduce demand of potable water in the ACT.





## Food security

Australia's ability to supply food for its own consumption into the future may be impacted by changes in climate, environmental degradation and food wastage. Most of the food consumed by the ACT population is sourced from outside of the ACT; therefore any adverse impacts on the Australian food supply could affect food and nutrition security in the ACT.

High prices caused by food shortages particularly affect the diet and nutrition of low-income groups and contribute to food insecurity, dietary inadequacy and chronic disease risk.

Food security issues are frequently in the media and the ACT Legislative Assembly's Standing Committee on Climate Change, Environment and Water addressed food and related issues in its *Inquiry into Ecological Carrying Capacity of the ACT and Region*, tabled on 10 May 2012.

There are known pressures in the Australian Capital Region (ACR) for agricultural lands to be used for alternative uses that could fundamentally change the subsequent ability of the land to produce food and fibre. Examples of alternative land uses are housing, nature conservation, recreation and infrastructure (energy generation). The *ACT Planning Strategy* identifies the need to take a regional approach to agricultural lands protection and food security. Under Strategy 8 of that Strategy there are a series of actions to investigate and resolve the 'best uses' of land surrounding Canberra. This is an issue that the *Regional Strategic Plan – Land Use Planning and Infrastructure* will consider under the ACT and NSW Memorandum of Understanding for Regional Collaboration.

The Minister for Environment and Sustainable Development Mr Simon Corbell MLA, announced on 28 June 2011 that '*the government will undertake a scoping study to investigate local food production in the ACT...*' This study is underway with potential for further investigation to progress this issue for the ACT.

The Australian Government is currently preparing a National Food Policy with the Green Paper currently in circulation. [www.daff.gov.au/nationalfoodplan](http://www.daff.gov.au/nationalfoodplan)

## Natural resource management

Scientists are already observing significant changes to the natural cycles, behaviour and distribution of our flora and fauna in response to climate change. The ongoing impacts on biodiversity are expected to be serious, even with only a small increase in average temperature (**1°C or 2°C**). Species with restricted climatic ranges, small populations and limited ability to migrate, are most likely to suffer dramatic declines or local extinction as suitable habitat disappears in the ACT.

Climate change projections indicate that we can expect more severe weather, with higher rainfall in coastal regions, more severe storms, cyclones forming further south and elevated sea levels. Inland, higher temperatures are expected, along with more severe and sustained droughts and heatwaves, which will increase the number, intensity and duration of bush fires. Climate change will also result in lower than average and less evenly distributed, less predictable rainfall, meaning drier overall conditions and the potential for increased flash flooding. Availability of water will be a major determining factor in the persistence and distribution of species across the landscape.



The ACT Government will continue to develop and implement an integrated framework of policies to protect the ACT's biodiversity through:

- strengthening ecological connectivity between native vegetation corridors
- better management of threats to the reserve system
- building knowledge and awareness in government and the community of ACT environmental assets and potential impacts of climate change
- engaging in landscape and regional scale planning for biodiversity with ACT and regional stakeholders
- research on key issues related to biodiversity and climate change adaptation, especially related to ecological connectivity, weeds and pest animals, and
- strengthening partnerships with land managers.

**Action 17:** The ACT Government will continue to assess the potential impacts of climate change on ecological systems in the ACT and the surrounding region and integrate this knowledge into environmental management and development planning decisions to ensure our natural environment is conserved and enhanced.



# 11.

## MONITORING AND REPORTING ON PROGRESS





Monitoring and reporting processes will be central to demonstrating achievement of actions in AP2, as well as supporting the ongoing review of policy setting to ensure the implementation of actions in the most cost-effective manner.

This section sets out the government’s commitment to comprehensive, timely and transparent reporting under AP2 and an adaptive evidenced-based approach to policy development.

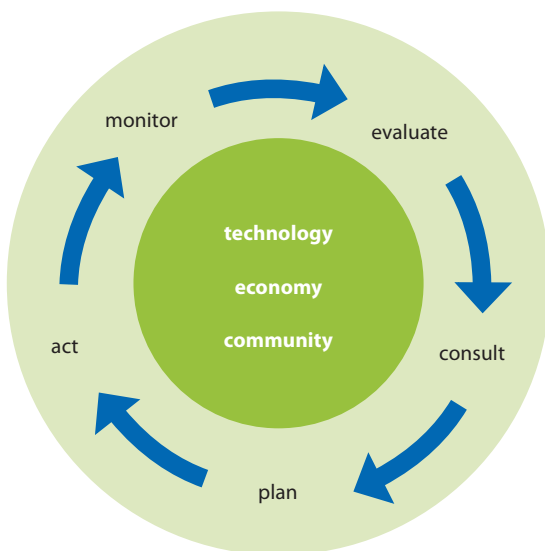
## Adaptive and evidence-based policy development

In reality, there are a variety of community views and a degree of uncertainty over the best way to abate emissions by 2020, let alone 2060. Circumstances will change over time and new opportunities will arise. Taking an adaptive and evidence-based policy development approach will allow the ACT to respond to the changes in technology, costs and community attitudes and behaviours as they emerge.

While AP2 sets out a clear framework for how the Territory is to achieve its emission reduction goals and to adapt to a changing climate, technology, the economy and community attitudes are not fixed. New ideas and alternative strategies may emerge along the path to 2020 that the government will need to monitor and respond to. In some cases this may result in minor adjustments to strategies, or entirely new approaches being developed.

Figure 33 illustrates a high-level framework for adaptive policy development and responding to changing conditions overtime, which underpins the ACT Government’s approach to implementation under AP2.

**Figure 33: Adaptive policy development, responding to changes in technology, economy and community**



An adaptive management approach involves continuous monitoring and evaluation of actions against goals. Action planning needs to be informed by the views and needs of stakeholders.

AP2 proposes a new and transparent framework to ensure implementation adheres to best risk management practices, to ensure that changing circumstances can be responded to in a timely manner.

All regulatory measures will be subject to detailed cost benefit analysis and a regulatory impact assessment process and subject to scrutiny through the normal budget process as appropriate





The Office of the Commissioner for Sustainability and the Environment (OCSE) will, for the first time, publish periodic Implementation Status Reports (ISRs) on the implementation of ACT Government climate change policies. These will be delivered every three years, in 2014, 2017 and 2020. Consistent with the expertise of the OCSE, its assessment will be against the achievement of the following outcomes:

- Reduced greenhouse gas emissions
- Adapting to a changing climate, and
- Leading a sustainable future.

Each ISR will address the following questions:

- How are we tracking against sector greenhouse gas reduction targets?
- What new opportunities or challenges have emerged?
- What are the implications for the Territory from developments in climate science?
- How fit for purpose are the Territory's climate change adaptation policies?
- How do the Territory's targets and actions stand in relation to developments at the national or international level?

In undertaking their reporting functions, the OCSE will be informed by the views of the ACT Climate Change Council, established under *Climate Change and Greenhouse Gas Reduction Act 2010* to provide advice to the Minister for Environment and Sustainable Development on reducing greenhouse gas emissions; and addressing, and adapting to, climate change.

### **ACT Climate Change Council**

The ACT Climate Change Council was established as part of the *Climate Change and Greenhouse Gas Reduction Act 2010* to provide advice to the Minister for Environment and Sustainable Development on reducing greenhouse gas emissions; and addressing, and adapting to, climate change.

The ACT Climate Change Council brings together community representatives with a broad range of skills to help identify and address barriers to achieving a dynamic and low carbon economy and society.

The Council includes members with expertise in the energy sector, transport planning, social equity, built environment, environmental management and climate science, as well as those with an understanding of business and community interests. The Council will play an important role in coordinating discussion and providing advice to government on the path to achieving emissions reduction targets.

Visit [www.environment.act.gov.au/climate\\_change/climate\\_change\\_council](http://www.environment.act.gov.au/climate_change/climate_change_council)

Independent reporting by OCSE will ensure an independent assessment is made. The ACT Government will table a response to each ISR report within the next scheduled Minister's annual report under the *Climate Change and Greenhouse Gas Reduction Act 2010*. Figure 34 sets out expected reporting timeframes out to 2020, leading to the publication of Action Plan 3 in 2021.

### **Minister's Annual Report**

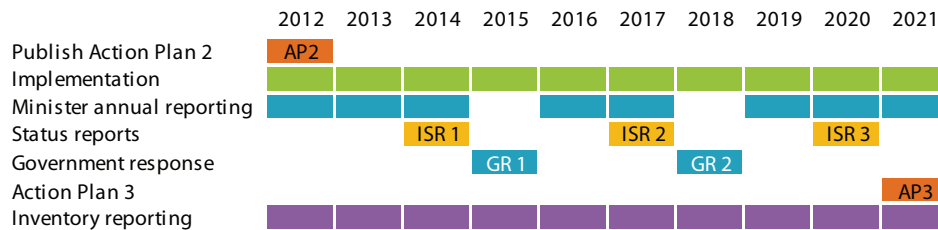
For each financial year, the Minister must prepare a report on, but not limited to:

- the effectiveness of government actions taken to reduce greenhouse gas emissions during the financial year, and
- the findings of a cost-benefit analysis of any government policies or programs implemented to meet the targets.

Future reports will include an assessment of the cost of living impact of climate change policies with a focus on potential social equity impacts.



**Figure 34: Reporting timeframes under AP2**



## A more timely and transparent greenhouse gas inventory

The ACT Greenhouse Gas Inventory is our most comprehensive account of greenhouse gas emissions in the ACT. It has a broader scope than that given in the State and Territory Greenhouse Gas Inventories 2009 prepared by the Commonwealth Department of Climate Change and Energy Efficiency (DCCEE).

The DCCEE inventory for the ACT calculates emissions using a production approach which includes only the specific facility or production process where emissions occur (scope 1 emissions). The ACT has adopted a position of assuming additional responsibility for the greenhouse gas emissions created in the production of the electricity that is supplied to the ACT from the National Electricity Market (scope 2 emissions).

To facilitate ongoing policy development and review processes under AP2, and to support greater community in emission reduction policies in the ACT, the government will work to improve the timeliness and scope of greenhouse gas reporting through the ACT Greenhouse Gas Inventory. Specifically, the government will:

- move to more comprehensive online data reporting, including publication of electronic data tables
- aim to have at least 90% of emissions reported within 12 months of the end of each reporting year
- investigate options for real-time, or near real time, reporting of Territory electricity and gas consumption and renewable energy generation at the Territory level, or for specific network areas
- investigate options for extending reporting to major scope 3 emissions including air-travel, and
- investigate options to provide more detailed information on fugitive emissions from industry and other sources.

The move to more comprehensive and timely reporting will support community engagement and increase transparency of the Territory's performance against targets. Providing more real-time electricity and gas usage information, or information broken down to specific neighbourhoods or network areas, also provides the opportunity for the community to better understand energy usage in the Territory, and potentially develop innovative demand management strategies.

**Action 18:** The ACT Government will respond to implementation Status Reports on AP2 published in 2014, 2017 and 2020 that will set out progress against actions and targets and move to more timely and transparent greenhouse gas inventory reporting. An assessment of potential social equity impacts will be completed each year and reported to the Assembly as part of annual reporting under the *Climate Change and Greenhouse Gas Reduction Act 2010*. Each measure introduced as part of AP2 will be subject to a cost of living assessment. The assessments will look at the overall increases in cost of energy to consumers and will guide the ACT Government's consideration of the pace of AP2's staged implementation.

# APPENDIX A





## APPENDIX A- CARBON OFFSETS POLICY

### Introduction and purpose

The ACT Carbon Offsets policy has been developed under AP2 to guide how carbon offsets can contribute to meeting ACT emissions reduction objectives.

The ACT Carbon Offsets Policy:

- outlines the criteria that will be applied to the purchase of carbon offsets to ensure their quality
- presents a hierarchy for the production and purchase of carbon offsets by the ACT
- proposes that the methodology for reporting carbon offsets under the ACT Greenhouse Gas Inventory be in place by 2015, and
- establishes the principles for the purchase of carbon offsets under the ACT Government Carbon Neutral Framework.

### Background

The *Climate Change and Greenhouse Gas Reduction Act 2010* establishes a target of zero net emissions for the ACT by 2060. This legislation also establishes interim emissions reduction targets of 40% below 1990 levels by 2020 and 80% below 1990 levels by 2050. AP2 outlines how the ACT aims to achieve its emissions reduction targets.

### What is a carbon offset?

A carbon offset is an investment in a project or activity that reduces greenhouse gas emissions or sequesters carbon from the atmosphere in order to offset the equivalent production of greenhouse gas emissions elsewhere.

Carbon offsets can be generated by:

- reducing or preventing greenhouse gas emissions, for example, through capture and destruction of methane emissions from a landfill or livestock manure, or
- removing carbon from the atmosphere and sequestering it in soil or trees, for example, by growing a forest or reducing tillage on a farm in a way that increases soil carbon.

### National policy context

In November 2011, the Australian Government established a price on carbon as part of the Clean Energy Legislative Package. This package also established the Carbon Farming Initiative (CFI), a domestic carbon offsets scheme. Australian Carbon Credit Units (ACCUs) generated under the CFI can be sold to other businesses wanting to offset their own emissions.

### Location of carbon offset projects

To maximise economic and other benefits for the ACT from offset project investments, it is desirable for an offset project to remain within the Territory or in our region where possible. In the first instance the ACT will pursue local options for carbon offsets projects. If local projects are not feasible, the barriers to these will be investigated. The ACT Government will apply a priority order to carbon offsets from local to regional projects then national and finally international where appropriate. This is consistent with the overall priority order for abatement measures under AP2.



An assessment of the viability of local offsets projects and the lead-in time required before offsets can be generated may lead to an initial lack of local offsets for purchase. This may necessitate the procurement of carbon offsets beyond the borders of the ACT.

## Ensuring the quality of carbon offsets

The ACT Government will be guided by six key principles in determining the quality of carbon offsets. These principles will be used to determine the quality and suitability of carbon offsets and are closely associated with the principles which underpin the CFI:

- **financial and regulatory additionality** – the emission reductions are additional to what would have occurred under a ‘business as usual’ scenario. An alternative way to look at it is to ensure that the emission reductions would not have occurred in the absence of the investment in offsets.
- **environmental additionality** – an emissions reduction activity should not cause an increase in emissions outside the boundaries of the project.
- **conservative** - emissions reduction and sequestration activities will always take a conservative approach for the methodologies, numerical values and procedures chosen so that emission reductions are not over estimated.
- **nationally and internationally consistent** – emissions estimation and carbon accounting methodologies are consistent with national and international standards.
- **measurable and verifiable** – emission reductions should be measurable and verifiable through technical measurement processes, measured against a consistent baseline, be consistent over time and must be able to be audited by a third party.
- **permanence** – this principle is only relevant to sequestration projects, and these types of projects should ensure that emission reductions are guaranteed for at least 100 years.

## Priorities for the production and purchase of carbon offsets

The ACT Government will consider the following priorities for the production and purchase of carbon offsets:

### ***Priority 1- Produce offsets within the ACT using existing mechanisms***

The ACT will seek to maximise local action to reduce emissions by producing carbon offsets within the ACT as a first priority. These offsets may be generated through the Australian Government’s CFI or other voluntary markets recognised under the National Carbon Offset Standard (NCOS). Current acceptable activities under the CFI are: capture and combustion of landfill gas; destruction of methane from intensive livestock industries; environmental plantings; and savanna burning. Other methodologies are currently being considered by the CFI Administrator.

### ***Priority 2- Develop new methodologies that encourage offset projects within the ACT***

The ACT will investigate and develop new methodologies for consideration as carbon offsets under the CFI. The selection of methodologies will be subject to their financial and technical viability.

### ***Priority 3- Purchase carbon offsets from recognised domestic markets***

The ACT will purchase ACCUs from local carbon offset markets. These carbon offsets will be produced within Australia but not necessarily within the ACT. This may be a short-term option which could be phased out as the ACT is able to implement long-term carbon offset projects locally or regionally.



#### **Priority 4- Purchase carbon offsets from recognised international markets**

The ACT will purchase carbon offsets from international markets only as a last resort. This will allow the ACT Government to align carbon offset purchasing strategies with international sustainable development strategies in Least Development Countries. Each type of international carbon offset purchased would need to be thoroughly investigated to ensure that it meets the principles outlined in this policy.

### **Recognition of voluntary action under the Clean Energy Act 2011**

In order for carbon offsets to be recognised as reducing the ACT's greenhouse gas profile, all offsets generated or purchased on behalf of the ACT must be surrendered to the Australian Government Clean Energy Regulator without financial compensation.

With the exception of Priority 1 offsets, all carbon offsets must be of a standard to be recognised as voluntary action under the *Clean Energy Act 2011*.<sup>14</sup> This will ensure that, as far as practical, carbon offsets surrendered to the Australian Government on behalf of the ACT will contribute towards reducing the pollution cap under the *Clean Energy Act*.

### **Reporting**

Carbon offsets produced or purchased on behalf of the ACT will be reported and monitored in the ACT Greenhouse Gas Inventory (GGI). The GGI tracks the progress of the ACT towards our emissions reduction targets and is developed each year. The ACT Government will work have a formal methodology in place for the GGI by 2014.

The ACT Government will endeavour to ensure that all carbon offsets surrendered by Territory residents are recognised in the GGI.

### **Carbon Neutral ACT Government Framework**

The ACT Government is committed to becoming carbon neutral in its own operations by 2020. In addition to avoidance, abatement and mitigation activities, it is likely that the ACT Government will need to purchase carbon offsets to meet this target. The principles established under ACT Carbon Offsets Policy will form the Whole-of-Government approach to the purchase of carbon offsets under the ACT Government Carbon Neutral Framework. Carbon offsets purchased under the Framework will comply with ACT Government value for money procurement requirements.

### **Update and review**

The ACT Carbon Offsets Policy will be reviewed and updated in 2015 and 2018 as part of the commitment to respond to Implement Status Reports issued by the Office of the Commissioner for Sustainability and the Environment (OCSE) in those years. This timeframe will incorporate sufficient flexibility to provide for policy and technology changes and to provide relevant ongoing guidance on carbon offset projects. This will also allow the ACT to adapt to changes to Australian Government policy that are likely to significantly impact the ACT Carbon Offsets Policy.

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<sup>14</sup> Priority 1 offsets produced or purchased under the CFI and surrendered to the Clean Energy Regulator will be recognised towards reducing the pollution cap under the *Clean Energy Act*. However, carbon offsets purchased from voluntary markets recognised under NCOS will not.





