SUB-NATIONAL CLIMATE POLICIES

How does the ACT compare?

PART 1

Report

ACT
ClimateChangeCouncil
CCC

Acknowledgments

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PART 1

Report

ACT ClimateChangeCouncil CCC

Preface

This report compares the climate targets and actions of the Australian Capital Territory (ACT) in comparison to those of 12 domestic and 18 international sub-national jurisdictions. The analysis is based on compiled data across a range of areas for the sub-national jurisdictions. This data is presented in a number of organised tables under Part II of this report.

Executive Summary

Cities and states are taking climate action in many ways

- While often limited by measurement challenges or the size of their mandate, the ambition of sub-national jurisdictions often surpasses national actions. The importance of their role as agents of change is reflected in an emphasis on sub-national climate action at the 2015 UN Paris climate change conference (COP21). Comparison amongst jurisdictions and exchange through international networks is one key to sharing knowledge and best practices. **States and cities can act as laboratories for new approaches, providing examples that can be scaled up to national levels, and often have greater flexibility in designing and implementing policy measures than do nation states.** Sub-national leadership can thus play an important role in fostering wider climate change action.

This review of policies and actions identifies elements of ambitious and successful policy to achieve lower greenhouse gas (GHG) emissions (climate change mitigation) by states and cities

- These include high ambition in both **long- and short-term emissions targets and renewable energy targets; clear legal form, accountability and review mechanisms**; and, crucially, policy measures that support the stated ambitions and that can also achieve other objectives central to local areas beyond climate change alone.

Internationally and domestically, the ACT is an example of best practice climate governance

- **The ACT is among the leading jurisdictions nationally and internationally in key aspects of climate change mitigation policy, including the ambition and accountability of targets, renewable energy and emissions from the waste sector.** The first key aspect is the **ACT's overall target of zero GHG emissions by 2060**, with current legislated reductions of **40 % by 2020 and 80 % by 2050 (relative to 1990 levels)**, including its legal status and provision for review of progress towards achieving the target. This is in contrast to many other sub-national jurisdictions that only have political goals, limited frameworks for monitoring and review, or that rely to a large extent on carbon offset policy. Also notable is the ACT's decision to take responsibility for the emissions associated with emissions associated with the generation of energy used within the Territory. Called 'Scope 2' emissions, these are often omitted from GHG accounting for small jurisdictions. The second key aspect is the ACT's renewable energy target and implementation strategy.

What the ACT can learn from other jurisdictions

- In areas of relevance, given the ACT's emissions profile, other jurisdictions – in particular internationally – provide some leading examples from which the ACT could benefit in reaching its ambitious GHG targets. First, **energy efficiency standards for all buildings, including existing stock, could be used to achieve emissions reductions whilst simultaneously providing longer-term cost savings and improving comfort and amenity**. Second, as the ACT approaches its 2025 goal of 100% renewable electricity supply, transport is becoming a dominant source of emissions in the ACT profile. Learning from other jurisdictions could be timely, especially with regard to active transport policies, the size and coverage of public transport, and powering both public and private transport by electricity (which in future will have very low emissions for the ACT due to renewable energy policy). **Such transformation also improves local air pollution, public health, traffic congestion, and the livability and attractiveness of cities.**

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Introduction: From the bottom up?

Sub-national jurisdictions and leaders

Global discussions on ***climate mitigation***, that is reducing the amount of human-induced climate change, has been traditionally centred on the actions of nations, including through the United Nations (UN) climate change negotiations process. However in the lead-up to the 21st Conference of Parties to the Framework Convention on Climate Change (UNFCCC) in Paris in December 2015, the actions and aspirations of sub-national jurisdictions are receiving significant attention.

Many climate change mitigation policies rely on the ability, resources and will of local regions and urban areas to undergo transformation in many sectors, most notably in their means of energy generation and transport, energy efficiency in production and built infrastructure, and waste management. These are activities largely governed by local sub-national jurisdictions: (1) states, territories and provinces; (2) cities and urban areas; and (3) sub-urban city divisions and councils.

Urban areas are responsible for about three-quarters of the world's energy use and economic product, and a similar fraction of the world's emission of the greenhouses gases (GHG) responsible for climate change.[1 2 3 4] Over half (54%) of the world's population now resides in cities, a fraction that is projected to increase to 70% by mid-century.[5]

Working independently and together in growing networks, sub-national jurisdictions are in many cases leading their nation states in swift and effective climate change mitigation. States and cities can act as laboratories for new approaches and provide examples that can be scaled up to the national level or taken up by other local jurisdictions. They often have greater flexibility in designing and implementing policy goals and mechanisms. Sub-national leadership can thus play an important role in fostering wider climate change action.

California, for example, has a long history of stricter pollution standards than the rest of the United States, with Californian standards inspiring change in other states and at the national level. Another example of leadership by a sub-national jurisdiction in the US is New York City. The strict building and construction regulations, and major retrofits of aging housing stock, for example, has allowed the city to reduce emissions by 19% since 2005[6], exceeding the rate of emission reductions by the United States as a whole.[7] Similar actions are also being taken in the Australian context.

The Australian Capital Territory (ACT) has combined investment in household rooftop solar with large-scale solar and wind farms in order to produce 60% of the ACT's electricity needs with renewable energy by 2017[8], on the way to the 90% target at 2020. This greatly exceeds the national Australian ambition for renewables in the electricity mix[9], noting, of course, that a high renewables share in a small jurisdiction connected to the national electricity grid is much easier to achieve than a high share of renewables at the national level.

Networks, diversity and fragmentation

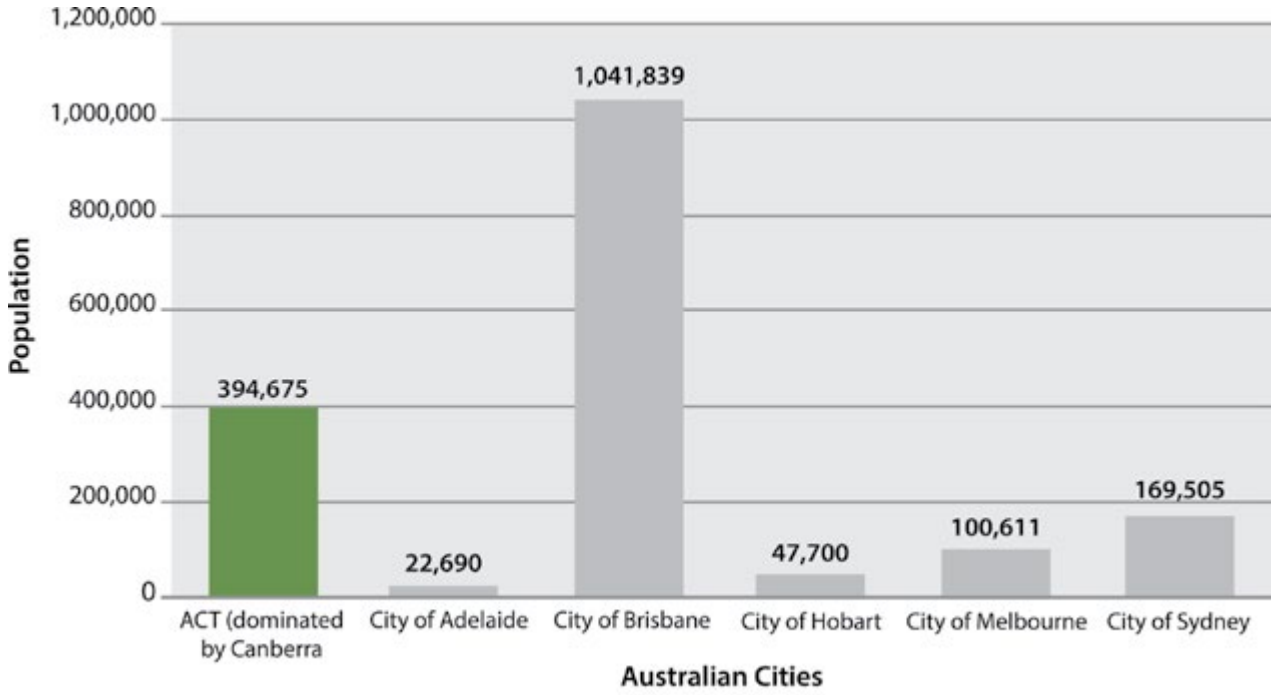
International networks have emerged that undertake a range of functions including lobbying and advocacy, the sharing of best practice and cooperative activities, as well as providing tools, advice and plans for city and local level climate action.[10] The Local Governments for Sustainability (ICLEI)[11] network has grown since 1990 to encompass over 1000 cities, local governments and municipalities. The C40 Cities for Climate Leadership Group[12], a group of over 80 cities, that accounts for 25% of global GDP, empowers its members to connect, and to share best practice and technical expertise.

The Under 2 Memorandum of Understanding (Under 2 MOU)[13] was created specifically to create sub-national pressure for action in the lead-up to the Paris UNFCCC climate summit. The Under 2 group includes 43 jurisdictions that have committed to either reducing their greenhouse gas (GHG) emissions 80-95% below 1990 levels by 2050 or achieving a per capita emissions target of less than 2 tonnes by 2050. The ACT has not signed up to the Under 2 MOU but would meet the criteria under its current legislated targets.

In addition to sharing practices and ambitious emissions targets, some initiatives have taken pragmatic steps to increase the transparency and accountability of sub-national climate action. The 2014 Compact of Mayors[14] was created through the C40 and establishes a common, standardised accounting and measurement system within which cities can report their emissions, climate risk and mitigation efforts. The Compact of States and Regions[15] aims to perform a similar function for regions and states.

Despite these efforts, the contributions to climate change mitigation from cities and sub-national actors are fragmented and difficult to document.[16] The nature of both targets and actions are diverse, and span aspirational renewable energy targets to established emissions trading schemes. Often non-state pledges and actions lack financial commitments or quantitative emission reduction targets.[17] In a review of 200 cities across 11 European countries, one study found that only 35% of the cities had a dedicated mitigation plan and only 28% had an adaptation plan.[18]

Figure 1: Key Parameters of Selected Australian Cities and Sub-Urban Areas



This diversity and fragmentation makes tracking the actions of sub-national jurisdictions difficult, and in-depth comparison even more so. Nevertheless, to encourage effective action, shape best practice and promote accountability, cities and states need to compare their climate actions to one another. This report specifically aims to put the climate policy of the ACT, home to the nation's capital city, Canberra, in a broader domestic and international context.

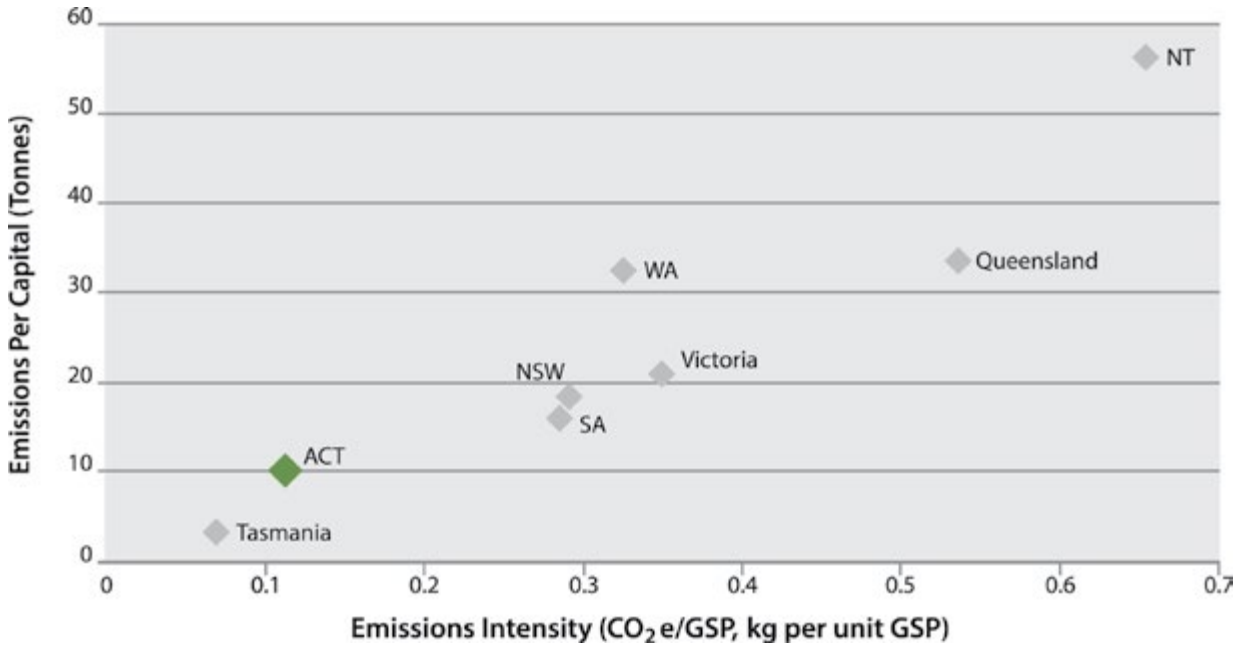
Approach taken in this report

This report has two key aims:

- to compare in a consistent framework the climate mitigation goals and actions of Australia's states, territories and capital cities and a number of international sub-national jurisdictions against those of the ACT, and
- to identify some elements of 'best practice' that can be used as benchmarks for climate policies of the ACT.

We draw upon a collection of different resources to present a concise overview of the actions and policies of a number of key cities, regions and states. The actors were selected based upon the availability of information, similarities to some aspect of the ACT context, and ambition of actions. In particular, official documents, climate strategy plans and implementation reports from a number of jurisdictions served as input; all are available on the internet. In addition, material from overarching projects such as the ***carbonn*** Climate Registry[19], 'Non-State Actor Climate Action Zone' NAZCA[20], and Carbon Disclosure Project[21] were used to collate existing information for some regions. This is supplemented with sources in the academic literature. Australian jurisdictions were given the opportunity to comment on the data collected for their jurisdiction.[A]

Figure 2: Key Parameters of Selected Australian Regions[B]

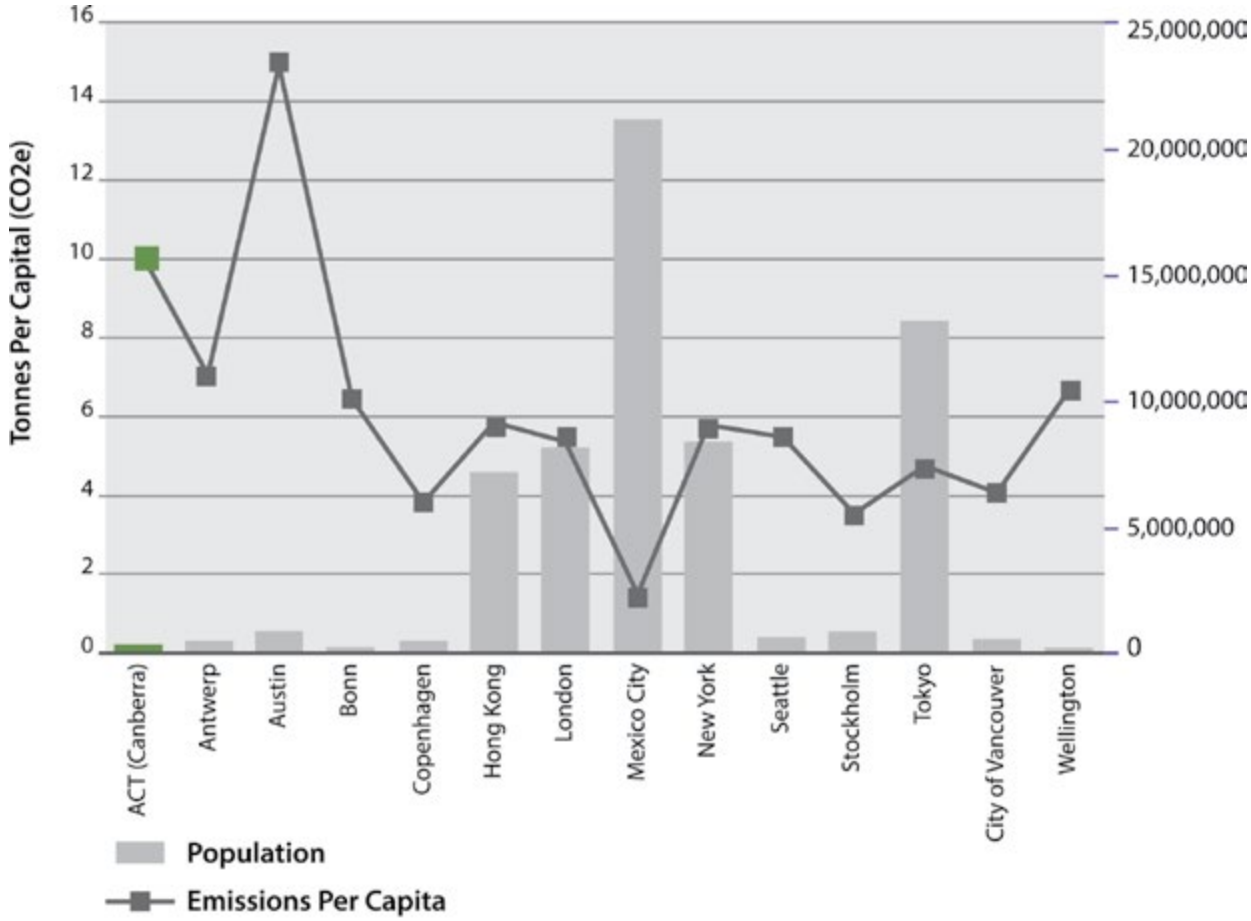


A Adelaide, Brisbane, Tasmania and Northern Territory replied and further clarified their targets and measures by the time of publication.

B Please note that the ACT figure is for Scope 2 emissions, while the other states and territories are based on data for only Scope 1 emissions.

Every city has a unique context due to its geography, culture, level of natural resources and economic development. However commonalities and differences within broad economic categories that influence climate action can be useful in identifying where climate policies can be replicated, and where new thinking will be required. We focus on the form and content of emission reduction targets, as well as targets and measures centring on energy supply (including renewable energy), energy efficiency, transport and waste. For the ACT, these are most relevant since the Territory has little industrial or agricultural production – in respect of its emissions profile, the ACT in general shares more characteristics with other cities than with states.

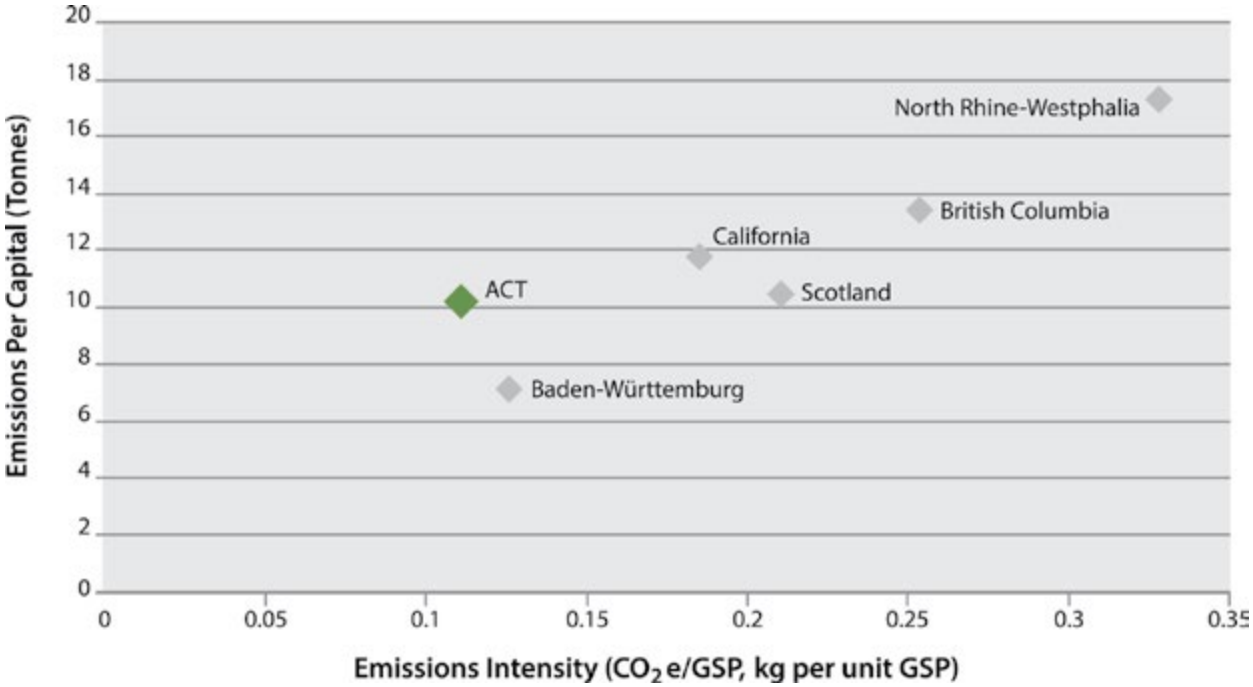
Figure 3: Key Parameters of Selected Non-Australian Cities



The characteristics of the sub-cities, cities and regions chosen for this comparison study are summarised in Figures 1 and 2 for Australian jurisdictions and in Tables 3 and 4 for international jurisdictions. Population size has been included and comparisons of emissions focus on the per capita metric for better comparability. The emissions intensity (kilograms of CO_2-e produced per unit of Gross State Product) of the economies of states and territories is also provided. Emissions data for many Australian cities are unavailable, but we have listed comparison data for a selection of international cities. It is important to note that some prominent 'city' level emissions targets in Australia refer to the 'City of', which usually refers only to one central area, generally the central business district, and omits the majority of the area, population, economy and emissions of the city as a whole.

The ACT is a territory, similar to a state in a federal system, but is dominated by the city of Canberra. Accordingly it is in a unique position whereby comparison to both cities and sub-national actors are appropriate. The ACT's emissions profile is more similar to other capital cities than other states and territories in Australia. However comparisons with the ACT to states are more appropriate with regard to legislated targets, possessing a wider governance mandate and generally having a larger population and land area.

Figure 4: Key Parameters of Selected International Regions



The ACT has one of the **lowest emissions per capita and emissions intensity rates in Australia** and among states and regions internationally.

Emissions Targets

Under the UN climate negotiations, all countries have committed to work to keep global warming below 2°C above pre-industrial levels; this commitment is expected to be re-affirmed at the Paris climate change conference in December 2015. The key to staying within this guardrail is to observe the so-called 'carbon budget' – a limited total amount of GHG that our civilization is allowed to emit if the average temperature increase is to be no more than 2°C.[22] The stock of GHG already in the atmosphere, and the rate at which it is increasing, means that near-complete 'decarbonisation' of the global economy by 2050 or soon after is required to meet the carbon budget.[23] That is, by mid-century, the net flow of GHG from human activities into the atmosphere must be nearly zero. Ultimately, stabilisation of GHG in the atmosphere at any level requires net zero emissions at some point in the future.

National decarbonisation pathways have been identified[24], relying on three pillars in the energy system: strong improvements in energy efficiency; complete decarbonisation of electricity supply; and fuel switching and electrification for transport. National decarbonisation pathways have been developed for 16 countries, including for Australia.[25]

The Australian Deep Decarbonisation[26] study shows that technical opportunities exist to reduce national emissions to net zero by the middle of the century, based on a comprehensive effort in development, deployment and investment in all sectors of the economy. This includes strong improvements in energy efficiency in Australia's industries, buildings and transport sector, a zero-emissions national electricity supply, shifting direct fossil fuel use to de-carbonized electricity, and improvements in industrial and agricultural processes. Carbon forestry would offset remaining GHG emissions from industry, agriculture and transport, a significant share of which would be for exported commodities. However the use of large-scale carbon forestry and land management is seen as problematic in the longer term due to issues of permanence, the limited capacity of terrestrial ecosystems and the fact that sequestration is primarily making up for the previous depletion of land and forest carbon stocks.[27]

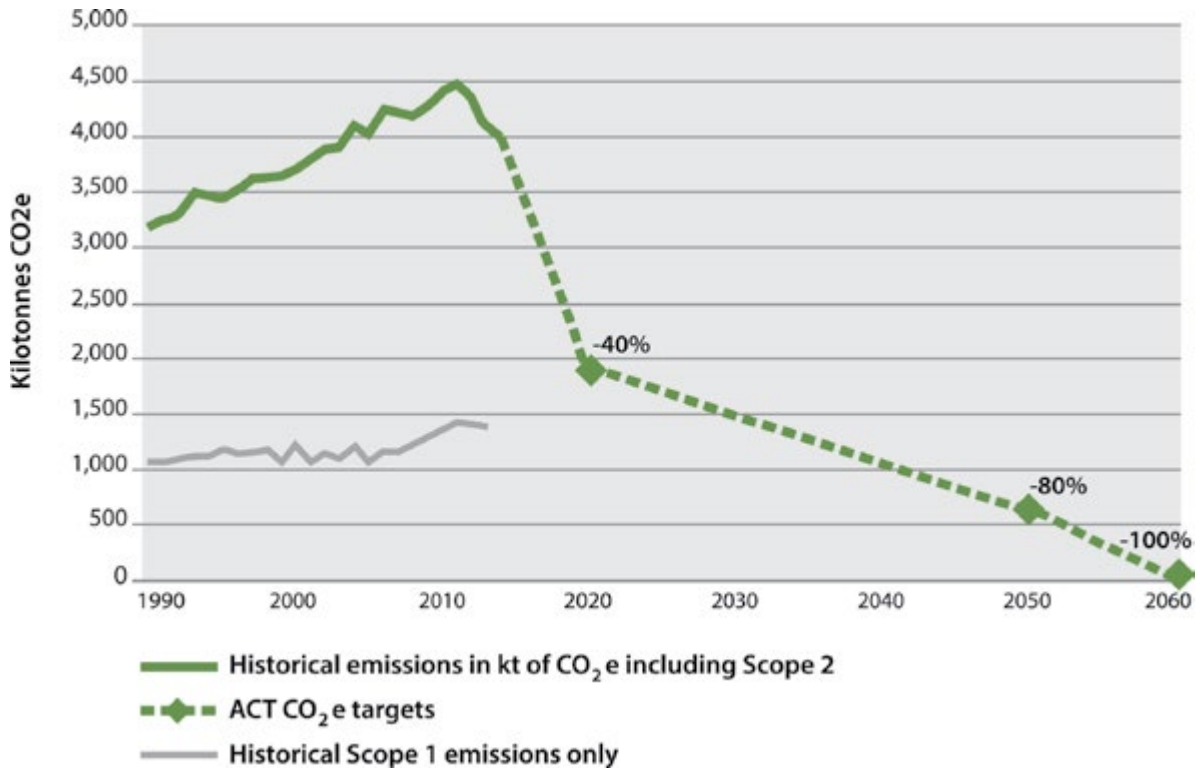
As a means of quantifying and making transparent the ambition and commitment of a local jurisdiction to climate change mitigation, nations and sub-national jurisdictions use targets for the reduction of GHG. The targets are generally expressed as a fraction of the GHG emissions by the locality in a particular year, called the baseline year. The year by which this target must be met is called the target year.

It must be stressed that in order to effectively meet GHG targets that have a known and appreciable consequence for global warming, emission levels must be precisely defined with respect to what they include and how they are measured, and then be continuously monitored. Ideally targets and progress should be compared against an appropriate carbon budget, for example as recommended by Australia's Climate Change Authority.[28]

Emissions Targets in the ACT

- The ACT has a long-term target of net zero emissions by 2060. There are two interim targets: reducing GHG emissions 40% below 1990 levels by 2020 and 80% by 2050. All targets have been legislated under the *Climate Change and Greenhouse Gas Reduction Act 2010*. The historical trajectory of ACT emissions and these targets are depicted in Figure 5.

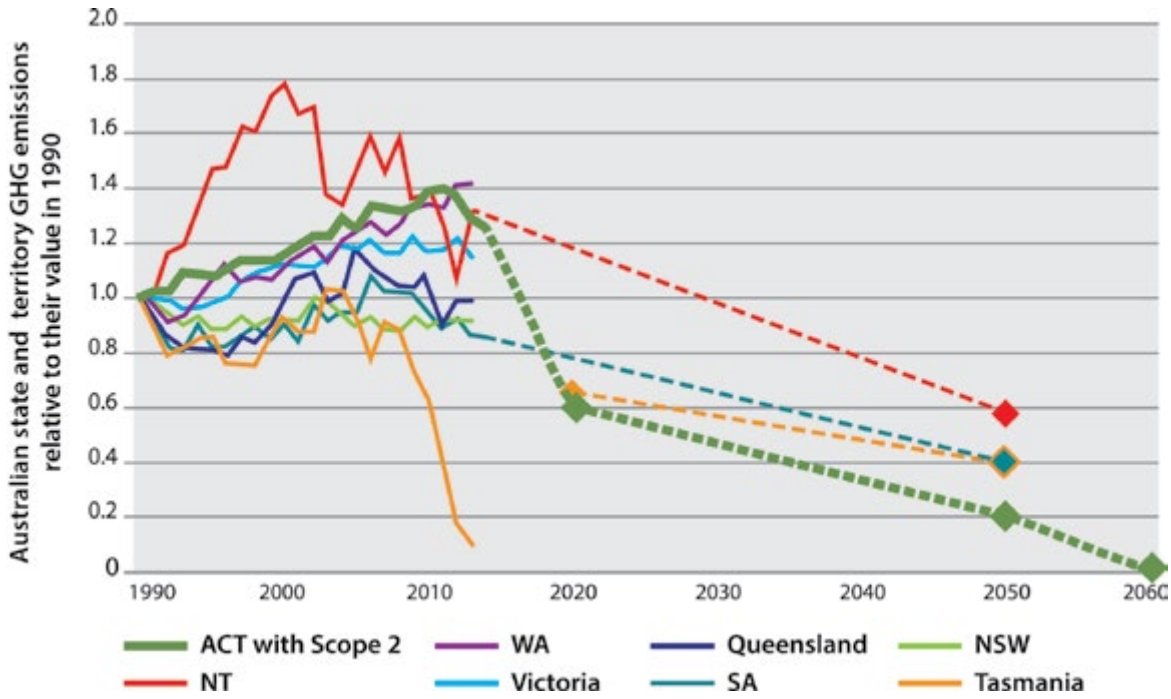
Figure 5: ACT Emissions Trajectory



- Regular implementation updates are publicly provided every three years along with the maintenance of a GHG inventory. The estimated emissions of the ACT in the period 2014-2015 was 3.93 million tonnes of carbon dioxide equivalent. With a population of approximately 394,675 this amounts to 9.97 tonnes per person.
- It is important to note that this number includes indirect emissions caused through consumption of electricity generated outside of the boundaries of the ACT and purchased from the national electricity grid (so-called Scope 2 emissions). The distinction matters greatly given that most of the electricity used by the ACT is not produced within the borders of the jurisdiction, and given that at present electricity consumption accounts for a large share of the ACT's emissions profile. Counting only emissions that originate within the geographical boundaries of the ACT (the so-called Scope 1 emissions), emissions in 2013-14 were 1.69 million tonnes or 4.2 tonnes per person.
- In contrast, the emissions of other states and territories under the national emissions inventories do not include scope 2 emissions (see Figure 6). Accordingly the representation for the emissions of the ACT is more comprehensive and accurate.

- ACT targets allow for the use of offsets; however, as per the ACT Carbon Offsets Policy, these are to be used as a last resort.[29] The definition of offsets varies between different jurisdictions and their respective policies. Offsets generally refer to the purchasing of permits for emissions reductions outside the jurisdiction, which can include reductions achieved through carbon land and forestry management. As noted previously, the use of carbon forestry and land management is problematic. Moreover, offsets often rely upon projects under mechanisms that cannot assure that the activities would not have occurred in any event (thus potentially lacking 'additionality'). They are also often undermined by excessively low market prices, as is now the case with the Clean Development Mechanism.[30] In any case, the purchase of permits can be a cost-effective way of achieving reductions but serves to delay decarbonisation within the jurisdiction. Ultimately, to stay within the 2°C carbon budget, all global regions must decarbonise. For these reasons the use of offsets should be noted and considered as generally less effective in effecting lasting climate change mitigation than emissions reductions achieved within the jurisdiction itself.

Figure 6: Australia States and Territories: Targets and Trajectories Relative to 1990 Emission Levels



Emissions Targets in Australian States and Cities

- Of Australia's other states and territories, only South Australia, Tasmania and the Northern Territory have legislated long-term mitigation targets; a 60% reduction at 2050 below 1990 levels (for South Australia and Tasmania) and 2007 (Northern Territory) levels, respectively. The Northern Territory target is aspirational, while the Tasmanian target has already been achieved due to changes in emissions accounting under the Kyoto Protocol.
- None of Australia's other capital cities have formal long-term emissions targets. A number of core metropolitan areas of the capital cities have aspirations or targets of reaching deep reductions, carbon neutrality or net zero emissions by 2020 or 2030. The City of Melbourne's municipal target of net zero emissions by 2020 ranks as the most ambitious amongst states, territories and cities. Canberra is the only Australian capital city that

Copenhagen is aiming to reach net zero GHG emissions by 2025 with minimal use of offsets. This example of global best-practice climate action will be achieved primarily through the use of transport and renewable energy measures.

shares local government with the territory in which it sits, and hence the only Australian capital city where a comprehensive emissions target applies to the entire city. This is in marked contrast to the targets of the core metro areas such as the central business districts of Sydney or Melbourne, which cover only parts of the inner cities and not suburbs or industrial areas, with a narrow base of emissions sources and more limited mandates as local governments rather than state or territory governments.

- In general, the interim and long-term targets of cities are significantly more ambitious than states or territories. This is potentially due to smaller jurisdictions and populations and therefore a generally narrower base of emissions sources. The goals of different Australian states and territories are depicted in Figure 6, where emissions and targets are expressed relative to the historical emission level in 1990 (for that reason, all trajectories intersect at 1990). Tasmania has an ambitious goal of reducing emissions by 60% on 1990 levels by 2050 which has already been exceeded. However the achievement of this goal has been due to new accounting rules for land-use, land-use change and forestry for Australia under the Kyoto Protocol. These new rules led to Tasmania significantly increasing the 'offset' role of carbon sinks such as state-owned multiple-use forests.
- Most Australian states, territories and capital cities make use of carbon offsets (excluding New South Wales, Tasmania and Western Australia, for which intentions are unclear).
- Other than for the ACT, South Australia and Tasmania, emissions targets have unclear legislative status or are non-legally-binding.

Emissions Targets in Non-Australian States and Cities

- There is a remarkable similarity between sub-national targets in the jurisdictions examined in this report, with the majority using a 1990 baseline and an aim of an 80% reduction by 2050, as seen in Figure 8. This congruence could be partially due to the influence of international networks and pacts such as the Carbon Neutral Cities Alliance and Under 2 MOU. These common targets suggest that existing networks and agreements are reaching some success in aligning the aims of different cities and sub-national actors around the world.
- For many of the targets the legislative status is unclear. All states and territories have enshrined their targets into legislation with the exception of the Northern Territory which possesses an aspirational 2050 goal. Cities generally have adopted council decisions underpinning their targets; the legal force of these is generally less than the legislated goals of states and territories.
- The extent of information available about the targets and progress towards achieving them differs greatly between jurisdictions. The states/provinces and cities with the most ambitious targets also tend to have the most easily accessible and regularly updated information.
- While many jurisdictions do make use of offsets, usually purchased from renewable energy or land management projects outside of the jurisdictions, some with very ambitious targets, such as Baden-Württemberg and Stockholm, do not. Others, such as Copenhagen, do purchase energy outside of their municipal borders but have expressed a desire not to use carbon offsets.
- There is no pronounced or systematic difference between cities, regions and municipalities in terms of ambition, use of offsets or progress. Figures 7 and 8 depict a range of different interim (2012-2031) and long term (2050) goals for a range of selected jurisdictions against the ACT.

Figure 7: Early and Interim GHG Reduction Targets for Selected Jurisdictions Relative to the ACT

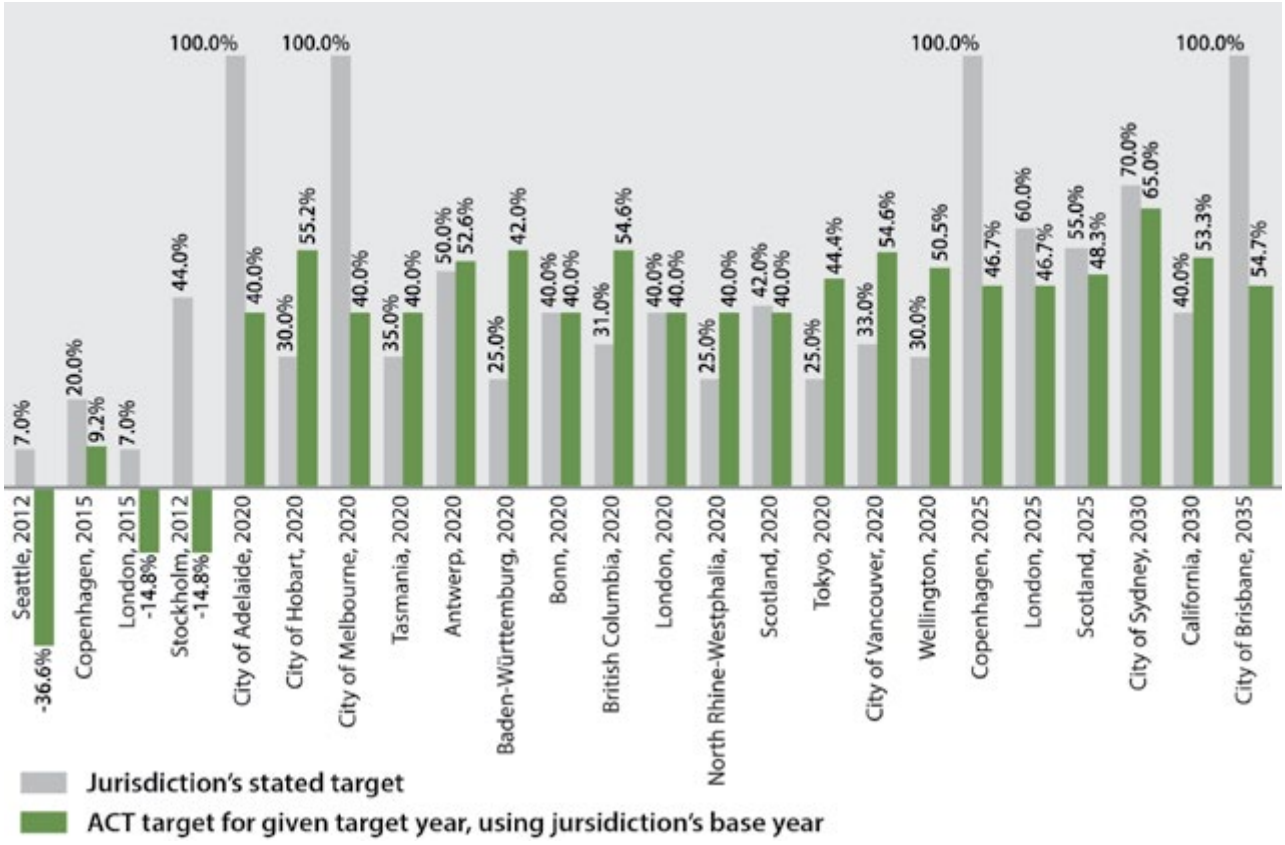
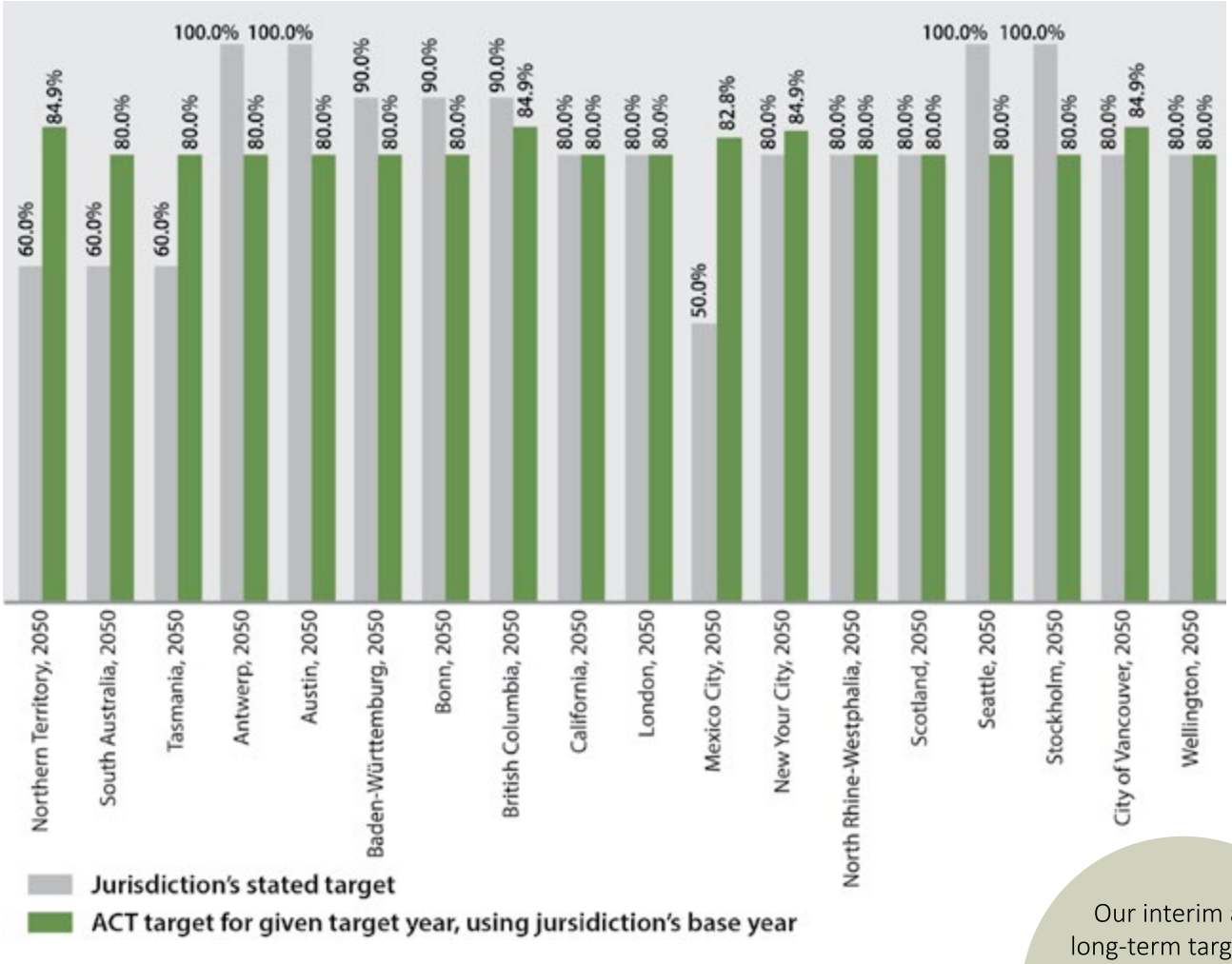


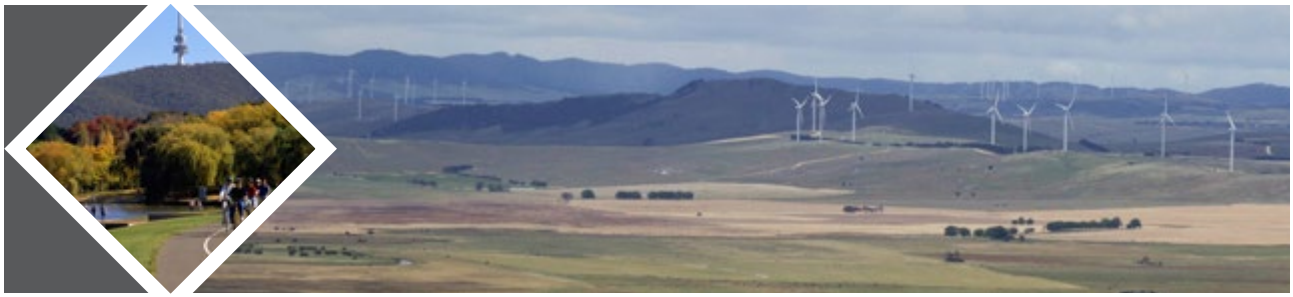
Figure 8: Long-term (2050) GHG Reduction Targets for Selected Jurisdictions Relative to the ACT



Our interim and long-term targets to reduce greenhouse gas emissions are **comparable to the most ambitious in the world**.

Summary of Emissions Targets

- The ACT is amongst the most ambitious of states and regions surveyed here. However, it does not quite match ambition compared to some leading cities such as Copenhagen. Australian metro areas such as the City of Melbourne have stronger headline targets; however, they apply to only the metro area with a small population in high density dwellings, and rely significantly on offsets.
- The legal form and periodic reporting of the ACT rank highly amongst domestic and international jurisdictions, many of which have political pledges rather than legislation and lack regular reporting frameworks.
- Some jurisdictions (such as Scotland and California) have clearer provisions for review of implementation than the ACT.
- The extensive provisions for emissions offsets amongst many Australian states, territories and capital cities – though not the ACT – is greater than general international practice, as indicated by the sample in this report.



Renewable Energy

Globally, and in Australia, fossil fuel combustion for electricity generation and transport is by far the largest contributor to anthropogenic (human-caused) climate change through the carbon dioxide released during combustion. Alternatives are renewable energy sources such as hydro, solar, wind and wave, as well as technologies such as geothermal energy and nuclear power.

Most emissions reduction strategies include a strong focus on the use of non-fossil-fuel-based energy, and in particular renewable energy. In principle, all human energy needs could be met with renewable sources, which are generally produced more locally than fossil fuels, and thus can aid in a region's energy security. Australia is particularly well endowed with renewable energy sources, as the sunniest and one of windiest continents in the world[31], and costs for these technologies have been falling rapidly.[32]

Renewable Energy in the ACT

- The ACT has a legislated renewable energy target of supplying 90% of the electricity supply from renewable sources by 2020. A 100% renewable energy goal for 2025 has been announced recently.[33]
- The targets are to be achieved principally through large-scale wind and solar auction schemes. Under these schemes, the construction of utility-scale renewables plants (wind and solar power) is contracted on the basis of a ***contract-for-difference*** between private operators of power stations and the ACT Government. In a contract-for-difference, the low-carbon electricity generator is paid by government for the difference between the cost of investing in a particular form of low-carbon electricity generation and the average market price for electricity. This provides certainty about revenue to the operators and the lowest available support price for the ACT. The auctions are progressively implemented. The renewable energy generators can be, and to a significant extent are, located outside of the ACT's geographic boundaries – thus the ACT is making these investments in other states.
- In addition, there are a significant number of rooftop solar installations in the ACT; in the past these were supported through feed-in tariffs paid to households.
- It is worth noting that Australia has a national Mandatory Renewable Energy Target (MRET) in place for generation of a total of 33Twh of renewable energy generated by large-scale installations at 2020 (reduced from an original target of 41Twh), plus 4 Twh from small-scale and household installations. The ACT renewable energy target is in addition to this national target.

Renewable Energy in Australian States and Cities

- Renewable energy targets are commonly used in Australian states, territories and capital cities, even for those without GHG targets. Most are general, but some do specify particular energy sources, e.g. Victoria for solar and Sydney for tri-generation.[C]

C Tri-generation refers to the simultaneous production of electricity along with the conservation and utilisation of heat including for the generation of chilled water for refrigeration. This system of producing three energy outputs tends to be a more efficient and on-site form of energy production. This can be done, as is the case with some City of Sydney facilities, through the use of low carbon electricity production.

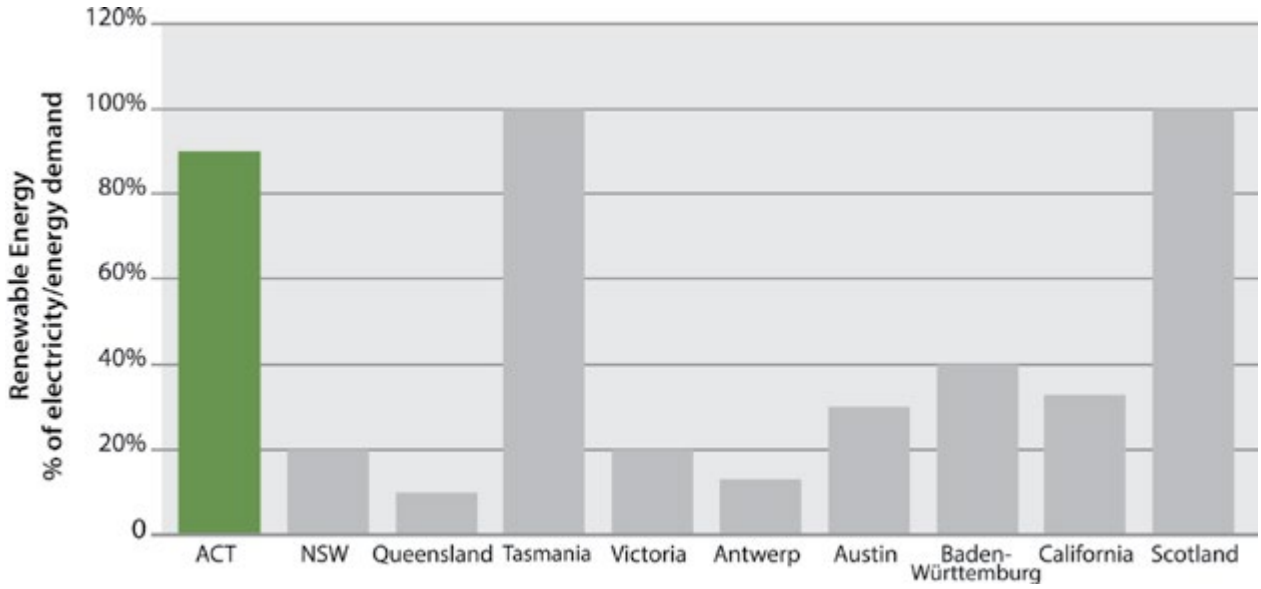
- The ACT, South Australia and Tasmania have the most ambitious renewable energy goals among Australian states and territories. It is worth noting that Tasmania's target implies only a small increase in effort given the amount of energy provided by existing hydropower stations.
- Feed-in tariffs, rebate and loan schemes, and creating maps of household energy demand are the most common strategies in implementing renewable energy.

Renewable Energy in Non-Australian States and Cities

- Some jurisdictions have taken more market-based approaches through carbon taxes (British Columbia) and emissions trading schemes (California and Tokyo). These are notably limited, but appear to have been successful in their implementation so far. It should be noted that such market-based mechanisms are aimed at reducing emissions in general and are not specific to renewable energy. However, by nature they tend to promote renewable energy as well as energy efficiency and have accordingly been grouped into this part of the framework.
- There are varying forms of renewable energy targets, with both percentage targets and targets for absolute amounts of renewable power.
- Measures to support renewable energy targets vary widely. Only a few jurisdictions possess feed-in tariffs, but direct investments and plant purchases are widespread.

Our goal to source **90% of the electricity supply from renewables by 2020** makes the Territory a **clear leader domestically and among the best internationally**.

Figure 9: 2020 Renewable Energy Targets



Summary of Renewable Energy

- The ACT's renewable energy targets are more ambitious than those of most other Australian states, territories and capital cities, and more ambitious than those of most international jurisdictions. As shown in Figure 7, the few exceptions include Tasmania (with a heavy use of hydropower) and Scotland (although their targets are in terms of gross electricity demand). The City of Copenhagen has a target to increase the supply of renewables in the energy mix to 100% by 2025, which is similar to the 2025 target of the ACT.
- Different policy instruments are used in different jurisdictions to achieve the targets. The ACT relies predominantly on a contract-for-difference model, while other jurisdictions use feed-in tariffs, as well as instruments including rebates, earmarked funds for renewable energy R&D or installations, and others. Several Australian states and territories, including the ACT, previously had feed-in tariffs for small-scale solar power, but these have been discontinued. An important feature of the ACT renewables target is that it likely to be achieved to a significant extent through investment in new renewables plants outside the ACT territorial boundaries.
- The use of market-based mechanisms such as the carbon tax in British Colombia or ETS in California have resulted in localised success and show potential, but have lacked wider adoption.

The 20 megawatt Royalla Solar Farm has the capacity to power 4,500 ACT homes with clean, renewable energy.

Energy Efficiency

Using energy more efficiently can mitigate climate change if the energy being used is sourced from fossil fuels and the overall energy use is decreased. Furthermore, efficient use of energy increases productivity and saves money. For these reasons, energy efficiency is often an early win-win strategy for jurisdictions that have not yet completely transformed to renewable energy sources. Improving energy productivity is seen as a key element of how climate change action can achieve broader economic benefits.[34]

Given the high reliance on fossil fuels in most parts of the world and in Australia, substantial GHG reductions can be made through more efficient use of household energy, energy used in industrial processes, transport fuels, and energy used to heat and cool household and commercial buildings.

Energy Efficiency in the ACT

- The ACT has a range of measures for energy efficiency in place, with the ACT Energy Efficiency Improvement Scheme (EEIS) being the central instrument. This project requires large electricity retailers to implement energy efficiency measures to meet the aforementioned energy savings target. It should be noted that the current list of eligible activities for the EEIS includes numerous options for implementing gas heating, but not some renewables-based activities such as the installation of heat pumps.
- EEIS has targets of achieving energy savings of 8.6% per year for Tier 1 (larger) electricity retailers. There is also a target of 20% energy savings per year between 2015-2020 for low-income 'priority households'.
- The ACTSmart program is an outreach initiative for low-income households that provides home energy efficiency education and assessment, and aids in water and energy efficiency retrofits, including appliance replacement. Energy efficiency standards for buildings are established in the Building Code of Australia.
- The ACT applies a number of energy efficiency provisions under the National Construction Code (NCC) to new buildings in the ACT. Houses must achieve the equivalent of a minimum of six stars in the 10 star Nationwide House Energy Rating System (NatHERS) scale, whilst for apartments a minimum of the equivalent of 5 stars with an average across all apartments of 6 stars. Water heaters and other equipment should also source their energy from low greenhouse sources where practicable. The standards have been raised a number of times in the past, most recently in 2010. The ACT also provides a number of additional provisions to encourage cost-effective energy efficiency and deter inefficient energy house extensions, including rewarding investment in high-performance window treatments to pre-existing windows.
- Building standards are also complemented by Minimum Energy Performance Standards (MEPS) for appliances and equipment, which were initially established under ACT legislation and are now made under the Commonwealth Greenhouse and Energy Minimum Standards Act.

- Once electricity is fully supplied by renewable energy as targeted by the ACT, reductions in electricity use will not directly contribute to further lowering GHG emissions. However, efficiency improvements save costs, and also apply to the direct use of fossil fuels such as gas for heating, which is a major source of emissions in the ACT.

Energy Efficiency in Australian States and Cities

- Targets are sparse and generally focus only on improving energy efficiency in council operations or buildings. One of the few exceptions is the Queensland requirement for all commercial buildings to meet a 4 star energy efficiency standard (implemented in 2010).
- The majority of efficiency measures are targeted towards building codes and standards, and education programs focused on individual behavioural change. One example is the 'Cityswitch' Program used in Adelaide, City of Melbourne and City of Sydney to encourage commercial entities to improve their energy efficiency practices.

Energy Efficiency in Non-Australian States and Cities

- Energy efficiency measures are the dominant form of activity for non-Australian sub-national jurisdictions. The majority of actions focus on buildings through standard setting, establishing guidelines and setting energy efficiency benchmarks. Thirteen of the analysed international actors possessed energy efficiency standards for either new or existing buildings.
- Particularly in jurisdictions with highly-carbonised energy sources, energy efficiency measures can be an effective and economical means of climate mitigation, with considerable co-benefits in other areas of regional or urban concern.
- Despite the plethora of energy efficiency measures, few of the studied jurisdictions have quantitative targets. This is true for some the most ambitious actors in emission reductions more generally, such as Scotland and the ACT. However, in the ACT, Action Plan 2 does include a notional level of abatement expected to be achieved through energy efficiency.

Summary of Energy Efficiency

- The implementation of energy efficiency standards for new and/or existing buildings is a widely used measure, but it is difficult to quantitatively compare the range of standards used.
- In Australia, energy efficiency standards differ among cities and regions, and tend to be less stringent than many international standards. This includes building energy standards, with significant opportunities for Australian jurisdictions to increase standards and thereby dampen long-term energy demand and the need to invest in additional energy generation.
- Higher energy efficiency standards for all buildings, including existing stock, could be used to achieve emissions reductions whilst simultaneously providing longer term cost savings and improving comfort and amenity.
- The pairing of energy audits with retrofit building programs is a common combination for many non-Australian jurisdictions.

Transport

Moving people and goods often, and over great distances, in vehicles powered by fossil fuels is a hallmark of the Industrial Age. Transport systems are typically ingrained into the culture and commerce of a locality, supported by substantial infrastructure. As a consequence, climate mitigation plans for transport often include long-term transformational change, and require actions on many different, but interconnected levels. To the extent that fossil fuel use is diminished, jurisdictions are likely to see co-benefits, especially with respect to air quality improvements.

Transport in the ACT

- Canberra and its surrounding region are essentially built for car-based transport. There are significant opportunities to increase the share of other modes of transport, and to cut back on emissions by shifting to electric vehicles over time.
- The ACT does not yet have a comprehensive set of measures to address emissions from the transport sector. However, it is in the process of developing a Low Emission Vehicle Strategy, and there have been a number of interlinked initiatives. Examples are the expansion of the public bus network, extension of facilities that link individual transport from and to the home with Park and Ride, Bike and Ride and Kiss and Ride facilities, delivering travel behavioral change programs and developing an extensive commuter cycle network to encourage active transport.
- The ACT has a number of mode-share targets for transport that are intended to encourage a shift away from cars. These include targets for individual modes of transport with the ACT aiming to increase walking to 7%, cycling to 7% and public transport to 16% (a total of 30% for all three) of journeys to work by 2026. The ACT is also aiming to reduce the average waiting time for public transport to 5-10 minutes by 2016. These targets along with the different measures are established in the Transport for Canberra 2012–2031 strategy.
- The ACT Government has decided to construct a light rail system from the northern suburb of Gungahlin to the central Civic area, with a possible extension to the adjacent neighbourhood of Russell. The tendering process is in the final stages and the project is due to begin construction in 2016. The light rail line is projected to achieve emission reductions of 18-30% along the transit corridor, depending on the size of the modal shift from private passenger vehicles to light rail.[35] A key motivation for the substantial investment is to achieve transformational change in the character, density and amenity for the respective parts of the city.

Transport in Australian States and Cities

- There is significant overlap between transport and council actions as many of the transport actions are aimed at council fleets. Both Brisbane and Queensland have made use of offsets to attempt to reach carbon neutrality in their fleets.
- Encouraging cycling and walking as well as considering major public transit infrastructure, e.g. light rail in the City of Sydney, are other key features for transport policies aimed at reducing emissions. The Brisbane 'Pedestrian Master Plan' and City of Melbourne 2012-2016 Bicycle Plan are examples.

- While most Australian states, territories and capital cities have measures and policies for transformation of transport in place, only four (Brisbane, City of Melbourne, Queensland and New South Wales) have targets in relation to transport.
- Active transport and public transit measures are often coupled with educational programs designed to aid in trip planning and encourage behavioural change towards public and active transport use; examples include the Tasmanian 'Smart Trips' program or Victorian 'TravelSmart' initiative.

Transport in Non-Australian States and Cities

- Internationally, transport targets are less prevalent than transport measures. Targets take a wide diversity of forms ranging from emissions intensity of travel through to numerical targets of electrical vehicle usage and percentage targets for active travel. The most comprehensive and ambitious jurisdiction of those reviewed in this report in terms of targets is Copenhagen with a goal of a carbon neutral transport sector by 2025, and to have 75% of all trips be taken on bicycle, on-foot or via public transport by 2025.
- Urban transport measures often have a notable focus on active transport, e.g., extending bicycle tracks and pedestrian areas. Copenhagen's construction of 28 bicycle superhighways covering 300 km is a particularly ambitious and noteworthy project.
- Investment in public transport is another key measure being taken by a number of areas. Mexico City's abolition of micro buses and creation of a large-scale BRT Metrobus system is an example of a complete, new system public transit that has been successful in decreasing both emissions and local air particulate pollution, such as that from black carbon.
- Other cities, such as Stockholm, London and Copenhagen, already have extensive public transport systems, which they intend to expand or power with new low-carbon fuels.
- Investment in electric vehicles and electrical vehicle infrastructure is another commonality. Many larger actors such as Scotland, Hong Kong and London are pursing the implementation and support of electric vehicles. Scotland has made public charging of electric vehicles free through the 'ChargePlace Scotland' initiative, and aims to provide electric vehicles charging infrastructure in all Scottish cities in the near future. The Scottish electrical vehicle roadmap aims to have Scotland free from petroleum vehicles by 2050.

Scotland is taking a leading role in the use of the electric vehicles by providing electric vehicles charging infrastructure and making public charging free.

- Taxes on transport fuels and/or vehicle ownership are in place in most countries at the national level, however at sub-national level taxes and charges have also been in use, but far less frequently. Stockholm has introduced a congestion tax while Seattle is exploring the option of a 'motor vehicle excise tax'. London's implemented an £11.50 daily congestion charge for the central city (Monday-Friday between the hours of 07:00AM and 18:00PM) which is another notable and successful example.
- The use of fuel blending or fuel efficiency standards is a less common but notable measure. California has made use of both low-carbon fuel mix and GHG vehicle standards, which have then provided the basis for US wide standards.

Summary of Transport

- A comprehensive and effective transport strategy needs to incorporate measures including expanding public transport, creating and expanding active transport networks (cycling and walking) as well as introducing fuel efficiency or fuel mix standards, and infrastructure to support electric vehicles.
- The ACT's target for a fully renewable electricity supply has a clear synergy with a shift towards electric vehicles, and more generally to an electrically powered public transport system.

Mexico City has revolutionised its transport through a reformed and expanded mass public transit system and active transport initiatives such as the Ecobibi bike share program and even cycling based 'green' rickshaws for tourists.

Waste

Although activities surrounding waste management generally have a smaller GHG footprint than the energy and transport sectors, removing waste from densely populated areas has always been a matter of concern for human cultures for health, environmental and aesthetic reasons. The nature of waste management (e.g. incineration, landfill, recycling) not only determines the associated GHG emissions, but in some cases can be used to co-generate energy or secondary (recycled) materials that can reduce the emissions of the energy, agricultural and industrial sectors.

Waste in the ACT

- The ACT aims to have a carbon-neutral waste sector by 2020 and to double the energy produced by the waste sector by 2020.
- The ACT is implementing a large and diverse range of initiatives including the investigation of methane capture and waste-to-energy technologies, as well as expanding bioenergy production, increasing recycling and increasing the energy efficiency of waste collection and processing.

Waste in Australian States and Cities

- In general, both targets and measures in the waste sector are far less prevalent than in the transport or energy sectors.
- There is a variety of different initiatives ranging from waste-to-energy and bioenergy production schemes in Tasmania through to landfill bans in South Australia. No clear trend is apparent in terms of measures.
- Few Australian actors have waste emissions targets. Three jurisdictions (Brisbane, City of Melbourne and Tasmania) have goals to decrease waste going to landfill in the short term, while Brisbane also possesses a recycling goal (domestic waste recycled/ recovered to increase by 2031 in comparison to 2012). New South Wales has a range of comprehensive goals including for diversion to landfill, recycling and waste generation per capita.

The **ACT is the only jurisdiction**, among the 12 domestic and 13 international surveyed, **with a target for achieving a carbon neutral waste sector by 2020**.

Waste in Non-Australian States and Cities

- Internationally, waste targets and measures are far less prevalent than transport or energy focused policies.
- Waste measures tend to focus on waste-to-energy programs, often with reference to co-benefits such as energy generated and reduced need to dispose of waste in landfills. Both Bonn and Copenhagen have extensive bio-gasification programs for district heating. These programs not only help to reduce the impact of the waste sector but also meet existing renewable energy targets. Others such as California, the City of Vancouver and Hong Kong are implementing more general waste-to-energy measures.
- Another key common measure has been encouraging recycling, including of organic waste, as well as bans. This can be seen in Scotland, which will ban biodegradable waste going to landfill by 2021 and banned recyclable material going to waste in 2014.
- Waste targets are not widely adopted and tend to focus on diversion rates. This may be partially a problem of integration as waste goals and plans are often not reflected or mentioned in climate action plans.

Summary of Waste

- Currently the ACT has the most ambitious waste target in Australia. No other sub-national jurisdiction targets waste sector carbon neutrality.
- The main areas of focus, including waste-to-energy initiatives, bans on certain types of waste materials and encouraging recycling, are covered by the existing waste management plan.
- Waste-to-energy programs should continue to be the core of waste sector efforts due to potential co-benefits. The potential of these programs is demonstrated by their widespread adoption and use.

Conclusion

In this report we have taken stock of GHG reduction policies in Australian states, territories and capital cities, as well as selected sub-national jurisdictions overseas, and compared them to targets, policies and measures in the Australian Capital Territory.

The picture that emerges is one of widespread action as well as diverse goals and measures at the sub-national level. Policies across the world and within Australia are taking place in very different local circumstances. The ACT is among a leading group of sub-national jurisdictions nationally and internationally in terms of its emissions targets and its renewable energy targets and policies. The target for zero emissions by 2060 and reduction targets for 2020 and 2050, in a clear legislated legal form and coupled with a strategy for regularly reviewing and achieving the goal, are best practice. The targets to achieve 90 % renewable electricity supply by 2020 and 100 % renewable by 2025 are more ambitious than most other sub-national jurisdictions; the primary mechanism to achieve this contract-for-difference for large scale renewables projects including outside of the ACT's boundaries is innovative.

In some areas of relevance other jurisdictions – in particular international ones – can provide leading examples from which the ACT could benefit on the road to achieving its ambitious GHG emission targets. First, energy efficiency standards for all buildings, including existing stock, could be used to achieve emissions reductions whilst simultaneously providing longer term cost savings and improving comfort and amenity. Second, as the ACT approaches its 2025 goal of 100% renewable electricity supply, transport is becoming a dominant source of emissions in the ACT profile. Learning from other jurisdictions could be timely, especially with regard to active transport policies, the size and coverage of public transport, and powering both public and private transport by electricity, which in the near future of the ACT will be low in emissions. Such transformation also improves local air pollution, public health, traffic congestion and the liveability and attractiveness of cities.

Cities and states have an important role in the transition to lower-carbon economies. They can act as laboratories for new approaches and create examples that can be scaled up to the national level. They often have greater flexibility in designing and implementing policy measures. At the same time, the diversity and in many cases fragmentation of sub-national climate change action provides opportunities for learning and greater effectiveness through harmonisation of efforts. All of these aspects apply to the ACT.

Learning from other sub-national jurisdictions can help us reach our **ambitious goals long-term goal of zero net emissions by 2060. Higher energy efficiency standards, public transport and transport electrification** are some key examples from other cities and states.

The implementation of a public light rail network in Canberra is an example of measure that could both reduce emissions and provide other benefits that make a more attractive and livable city.

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SUB-NATIONAL CLIMATE POLICIES
How does the ACT compare?

PART 1 Report

ACT
ClimateChangeCouncil
CCC