



CLIMATE ACTION  
**ROUNDTABLE**

# TRANSITIONING TO LOW-CARBON SOCIETIES

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## OPPORTUNITIES FOR COOPERATIVE ACTION

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# EXECUTIVE SUMMARY

The United Nations Climate Change Conference in Paris, December 2015 (COP21) was a **watershed moment**, at which the “Paris Agreement” to limit climate change and its effects was negotiated by 195 countries. Signatories agreed to lower anthropogenic emissions of greenhouse gases (GHG) quickly and substantially in order to keep global warming below 2°C – aiming for a goal of 1.5°C – above pre-industrial levels. Achieving this goal will require global “net zero” GHG emissions by 2050 or sooner and a transition to “low-carbon” societies, a journey now embarked upon by local communities the world over.

Transitioning to low-carbon societies offers the **opportunity** to generate and capitalise on innovation that is ushering in a healthier, more prosperous and more sustainable future. Subnational governments control or influence many instruments related to climate change mitigation, including city and land-use planning, environmental regulation, and energy policy. They are also able to influence spending and investment in relevant areas, and are at the new “coal-face” of integrating environmental, energy and economic policy. On the other hand, they often face regulatory barriers, lack of resources, inefficient governance arrangements and portfolio siloing that can inhibit swift, integrated action.

**Australian subnational governments have a history of working together** to facilitate more coordinated and effective climate change policy, both in mitigation and adaptation. This work has included cooperating with the Commonwealth government on carbon pricing and renewable energy targets. Often policies implemented at the national level, however, have been subject to subsequent reversals and changes, resulting in uncertainty and incoherence. The Climate Action Roundtable is an opportunity for subnational governments to explore how they can collectively make national climate policies more effective and robust, as well as foster joint policies and programs at the subnational level, over which they will have more direct control.

Following on the large presence of subnational governments at COP21, the **Climate Action Roundtable** was formed to create a forum at which Australian cities, states and territories can discuss initiatives to jointly realise social and economic benefits whilst simultaneously generating effective climate action. The August 2016 Climate Action Roundtable will focus on climate change mitigation and low-carbon economies. In future, a similar body of work may be directed to climate change adaptation.

The aspirations and individual actions of many Australian subnational jurisdictions are already nation leading, especially in the areas of greenhouse gas reductions and renewable energy. Through their state, territory or local governments, over **one-third of the Australian population has committed to achieving zero net GHG emissions by 2050 or earlier**.

The greenhouse gas profiles of each jurisdiction vary, depending on the relative size, industrial and agricultural activity, and uptake of renewable energy sources. Each jurisdiction participating in the Roundtable has a success story to share, as well as common challenges and opportunities in transitioning to low-carbon societies. For this reason, each jurisdiction can be both a giver and a receiver of knowledge at the Roundtable.

**This Report** provides a snapshot of commonalities and points of difference that can inform options for future collaborative Roundtable action on climate change **mitigation**. The Report includes a review of international cooperative low-carbon activities, but is based, in largest part, on responses from 12 subnational Roundtable jurisdictions (states, territories and capital cities) that completed a pre-meeting questionnaire.

Several common themes emerged from the **Roundtable survey**. Respondents felt that:

- Cooperation amongst Australian subnational jurisdictions confers substantial, perhaps even crucial, benefit to Roundtable members. Those benefits include having a **greater voice** at national and international levels, cooperating on complementary and **integrated regulatory frameworks**, and achieving **economies of scale**. The largest jurisdictions saw joint benefit in attracting low-carbon industries to Australia and engaging in cooperative research and training in low-carbon technologies.
- The most **crucial co-benefits** of transitioning to a low-carbon society are improved jobs outlook and employment growth, reduced risks to the adverse effects of climate change, the opportunity to attract new industries, and more sustainable local societies. Also rated highly by all respondents were reduced risks associated with business uncertainty, and fostering an innovative business culture.
- The **perceived major risks** of the transition to low-carbon societies are uncertainties induced by change, and increased energy costs for the community and business.
- The current economic and industrial profiles of their regions and mainstreaming climate action across all sectors are the primary **challenges** associated with the low-carbon transition. Other frequently noted key considerations include the perceived risks in

executing any change in policy, difficulties of achieving economic scale, and regulatory and legislative hurdles.

- Promoting **energy efficiency** is important to achieving quick GHG emission (and cost) reductions, but transformational change across several sectors is required to achieve net-zero emissions by 2050 and thereby limit global warming to below 2°C.
- Renewable energy and storage industries are **key drivers of change** in the low-carbon transition, as indicated by unanimous agreement amongst respondents. Other key drivers are building standards, design, construction, city planning, and electric vehicles.
- **Renewable energy policy programs and incentives**, along with educational programs, have the highest level of societal co-benefits, with relatively little difficulty in implementation. All of the states and territories that responded are encouraging renewable energy through policies, programs or incentives.
- Emissions **regulation** of any sector – energy, industry, transport, building/planning, agriculture, and waste – is often problematic to implement, but building regulation in particular is an area in which population-dense jurisdictions see great benefit in joint action.
- **Planning and building regulation** are areas in which joint Roundtable work is seen to hold high potential benefit. Also ranked highly are legislated renewable energy targets, transport policy, and educational programs. The four largest jurisdictions placed mechanisms that influence industrial and agricultural emissions as having high potential for cooperative action.

In addition to previous Australian collaborative work, the successful cooperation by subnational jurisdictions has also been demonstrated

elsewhere, notably in the federated states of **Canada and the United States**. There, joint intra-national climate programs have taken the form of emission cap and trade agreements, leadership agreements related to emission targets and integration of clean energy sources into the grid, region-city pacts for collaborative work in the building, transport, renewable energy and waste sectors, and initiatives specifically aimed at joint, networked efforts in low-carbon transport. These have resulted in demonstrably lower greenhouse gas emissions with no detrimental effect on the economy, and in many cases have provided resources to fund the transition. Importantly, these programs are not mandatory, but “**opt-in**,” that is formed by the particular subset of subnational jurisdictions that choose to take part, increasing the speed of action.

Taken together, it would appear that there is sufficient reason, will and precedent to embark on enhanced joint subnational climate action in Australia. Complementing other on-going work, both at the national and jurisdictional levels, the **Roundtable is a unique opportunity** to progress climate action that:

- Explicitly joins the strengths and interests of states, territories and cities,
- Supports the harmonization of emissions accounting and reporting between different levels of government,
- Allows subsets of subnational jurisdictions to “opt-in” to partnerships that serve to increase the ambition of current nationally-agreed goals whilst also serving as pilot projects to inform work,
- Increases the level of certainty and economies of scale for business and citizens, and
- Has, from the outset, a particular focus on the Energy-Environment-Economy nexus, which makes itself most manifest at subnational and local levels.



# SETTING THE SCENE

At the United Nations climate conference in Paris in December of 2015 (COP21), 195 countries adopted a global pact to decrease the risks and impacts of climate change. The agreement is aimed at reducing the world's emissions of GHG quickly and substantially in order to keep global warming below 2°C – aiming for a goal of 1.5°C – above pre-industrial levels. The deal is legally binding, and to date (12 August 2016), over 180 members of the United Nations Framework Convention on Climate Change (UNFCCC), including Australia, have signed. Australia has indicated it intends to ratify before the end of calendar year 2016. If actions follow intentions, enough nations will ratify to bring the pact into force in 2016 (Reuters, 5 Aug 2016).

Most specifically, the Paris Agreement pledges “to achieve a balance between anthropogenic emissions by sources, and removals by sinks, of greenhouse gases in the second half of this century.” Because carbon dioxide is the primary component of anthropogenic emissions, this balance is sometimes called “carbon neutrality” or “net zero emissions,” and requires a transition to a “**low carbon economy**,” that is, an economy that results in little or no emissions of greenhouse gases. Signing the agreement endorses **carbon neutrality by 2050** or sooner; this is the new, agreed benchmark. As an intermediate goal, Australia’s official Intended Nationally Determined Contribution to the COP21 agreement is its pledge to reduce national emissions by 26-28% on 2005 levels by 2030.

Australian State and Territory Governments have a history of working together to facilitate a more coordinated and effective approach to climate change policy. This cooperation includes the formation of the National Emissions Trading Taskforce in 2004, which undertook substantial work on the development of a national emissions trading scheme. The Council of the Australian Federation, established in 2006, continued this carbon pricing mechanism work and, with the Commonwealth Government, commissioned the first Garnaut review of the implications of climate change for Australia (Garnaut, 2008).

Subnational governments also worked with the Australian Government through the Working Group on Climate Change and Water on a variety of climate change policy issues including the transition to a national carbon pricing mechanism, the development of the National Strategy on Energy Efficiency and the design of the expanded Renewable Energy Target.

With the repeal of the carbon pricing mechanism in 2014 and the current uncertainty in the climate change policy environment at the national level, there is a real need for Australian states, territories and cities to work together to facilitate a robust, coherent and predictable climate change policy framework for Australia.

## THE CLIMATE ACTION ROUNDTABLE

Ministers, elected officials and top public officers from major subnational governmental jurisdictions (**states, territories and capital cities**) in Australia will meet on 26 August 2016 in Canberra as members of the Climate Action Roundtable to discuss possible cooperative climate action options, focusing on those that mitigate climate change and foster low-carbon societies.

2016 Climate Action Roundtable Goals

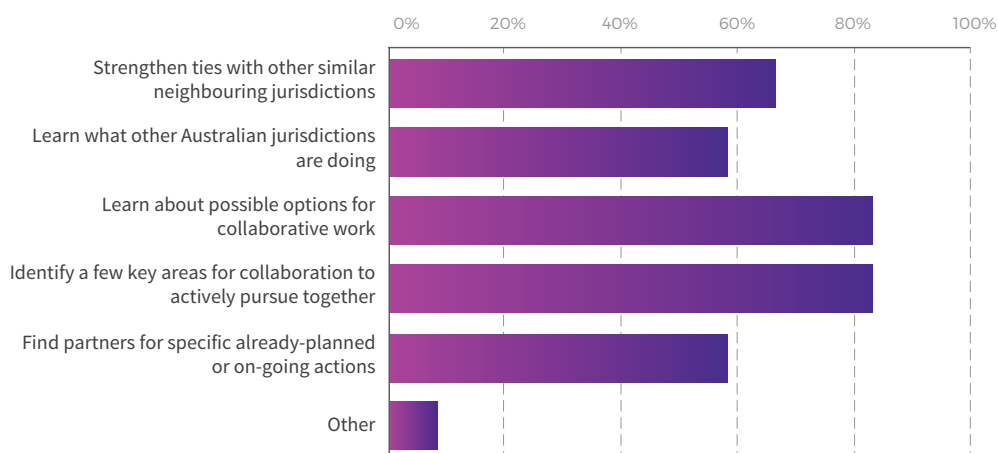


Figure 1: Goals for the Climate Action Roundtable as indicated by survey respondents

The Climate Action Roundtable meeting will release a public communiqué providing an overview of the meeting outcomes and this Report. The Report was compiled with the benefit of the pre-event stakeholder survey and other independent research, with the primary purpose of informing discussion during the August 2016 event. The survey polled Roundtable members about current and planned climate actions, emissions profiles, as well as perceived benefits, challenges and opportunities arising from climate action taken both independently and collectively.

## ROUNDTABLE MEMBER EXPECTATIONS

Prior to the event, Roundtable jurisdictions indicated their aspirations and expectations for the August meeting from a selection of choices, ticking all those that applied to their own jurisdiction. As can be seen from Figure 1 above, a large majority of jurisdictions expect to learn about options for collaboration and to identify a few key areas to actively pursue together. Strengthening intra-jurisdictional ties and identifying partners for specific projects are also expectations of most in the group. The success of the 2016 Roundtable will be measured by the degree to which these member goals are achieved.

Another nominated goal was to work toward finding a common position on the level of

ambitious climate action needed from all levels of government and the actions required to meet that ambition.

In describing expectations, respondents further noted that the Climate Action Roundtable is an opportunity to encourage long-term collaboration across jurisdictions and achieve positive economic and environmental benefits in addressing climate change. They also described it as an important opportunity for cooperative advocacy in encouraging federal and state governments to implement initiatives that support cities in making the low-carbon transition. One key issue is the resources available to coordinate activities and to act at the individual jurisdiction level. It is also felt that appropriate governance arrangements will be important for progressing action through the Climate Action Roundtable.

All major Australian subnational jurisdictions participating in the Roundtable have or are preparing a climate mitigation action plan. All major subnational jurisdictions also have climate adaptation strategies or programs in place, including cooperative work through the National Climate Change Adaptation Research Facility. As they make decisions that will shape future low-carbon societies in Australia, it is especially timely to increase learning from one another, and from international counterparts, about options for cooperative work on climate action to the benefit of all.



# LESSONS FROM ELSEWHERE

Cities, regions and other subnational authorities around the world have been working together in a variety of ways to spur climate action and invest in a low-carbon future. This cooperation has taken many forms, including joint efforts to influence national and international decision making, particularly in the lead-up to COP21, the formation of international coalitions to create knowledge networks or consortia with business and civil society, and working with other jurisdictions within the same or neighbouring countries to create joint policy, program or economic partnerships.

## SUBNATIONAL GOVERNMENTS AND THE COP21 IN PARIS

In the lead-up to COP21, over 1300 non-state stakeholders signed the *Paris Pledge for Action*, not only pledging their support for the new climate agreement, but promising to act through concrete steps that they take themselves to ensure that the level of ambition set in the Paris Agreement is met or exceeded. Recognising the triple benefits of decreased climate risk, increased sustainability and new, global, low-carbon economic possibilities, they are working independently and cooperatively to meet the imperative and the opportunity of climate change action. In many cases they are leading the countries of which they are part.

Signatories included cities and regions, businesses and trade unions, investors and civil society groups around the world.

Three Australian states and territories, namely the Australian Capital Territory (ACT), South Australia and Victoria, are among the *Paris Pledge* signatories, as are the US states of California, Minnesota, New York, Oregon, Vermont, and Washington, and the Canadian regions of British Columbia, Manitoba, Northwest Territories, and Québec.

## THE *PARIS PLEDGE* FOR ACTION:

“As cities, regions, businesses, investors, civil society groups, trade unions and other signatories, coming from every sector of society and every corner of the world, we realize that dangerous climate change threatens our ability and the ability of future generations to live and thrive in a peaceful and prosperous world. We also realize that taking strong action to reduce emissions can not only reduce the risks of climate change but also deliver better growth and sustainable development.

As a result, we the undersigned, affirm our strong commitment to a safe and stable climate in which temperature rise is limited to under 2 degrees Celsius.

In support of this, we welcome the adoption of a new, universal climate agreement at COP21 in Paris, which is a critical step on the path to solving climate change. We pledge our support to ensuring that the level of ambition set by the agreement is met or exceeded.

We will do this by taking concrete steps now, and without waiting for the entry into force of the agreement in 2020, both individually and cooperatively, to reduce greenhouse gas emissions to a safe level and build resilience against those changes already occurring.

We will look back at this moment as our turning point, when the transition to a low-emission and climate resilient economy became inevitable, irreversible and irresistible. We must, we can and, together, we will solve climate change.”

Five Mexican states, Greater Manchester, Scotland and Wales in the UK, as well as a large number of European regional areas, several in South American countries such as Brazil and Peru, and territories of Japan, Nepal, and Nigeria have signed.

Cities joining the pledge hail from every continent (except Antarctica), and span megacities to those with populations well below 1 million. Signatory cities include Melbourne and Sydney from Australia, as well as Amman, Athens, Auckland, Bogotá, Buenos Aires, Cape Town, Helsinki, Hong Kong, Houston, Jakarta,

Karachi, London, Los Angeles, Madrid, Mexico City, New York, Paris, Quito, Reykjavik, San Francisco, Seoul, Tehran, Tokyo, Vancouver, and Venice, among many others.

A very large number of businesses, both large and small, are signatories, including Adidas, Anglo American, Asia Pulp and Paper, Bank of Australia, Barclays, BASF, BHP Billiton, Coca Cola, and Deutsche Bank, just to name a few at the beginning of the alphabet. In Australia alone, investors who have joined include Australian Super, Australian Council of Superannuation Investors, Australian Ethical Investment, Christian Super, National Tertiary Education Union, NGS Super, Victorian Funds Management Corporation, and others.

## THE **PARIS CITY HALL DECLARATION** STATES IN PART:

- “We — the undersigned mayors, governors, premiers, and other local government leaders — commit collectively to:
- Advance and exceed the expected goals of the 2015 Paris Agreement to be reached at COP 21 to the full extent of our authorities;
- Produce and implement participatory resilience strategies and action plans to adapt to the rising incidence of climate- related hazards by 2020;
- Deliver up to 3.7 gigatonnes of urban greenhouse gas emissions reductions annually by 2030—the equivalent of up to 30% of the difference between current national commitments and the 2 degree emissions reduction pathway identified by the scientific community;
- Support ambitious long-term climate goals such as a transition to 100% renewable energy in our communities, or a 80% greenhouse gas emissions reduction by 2050;
- Engage in partnerships among ourselves and with global organizations, national governments, the private sector, and civil society to enhance cooperation and capacity-building programs, scale-up climate change solutions, develop metrics and promote innovative finance mechanisms and investments in low-emission projects across the world.”

## THE 2015 CLIMATE SUMMIT FOR LOCAL LEADERS

The [Climate Summit for Local Leaders](#) was held simultaneously with the COP21 meeting in Paris. The meeting was co-hosted by Anne Hidalgo, Mayor of the City of Paris and Michael Bloomberg, the UN Secretary-General’s Special Envoy for Cities and Climate Change. It has been described as the largest global convening of mayors, governors and local leaders focused on climate change. The meeting event was held on 4-6 December 2015, and had an attendance of over 1000.

The two primary products of the Climate Summit for Local Leaders are the [Paris City Hall Declaration](#) and a report entitled “[21 Solutions to Protect our Shared Planet](#).” They spell out in greater detail the commitments made by the Declaration signatories, and the means to achieve them.

The 21 Solutions Report focuses on three themes: adaptation to climate change, curbing the emissions that cause climate change, and engagement of local and regional leaders in new partnerships and platforms that reach beyond municipal borders to work with civil society, national governments, and the private sector. The report gives specific examples of actions taken by subnational jurisdictions in each of

these thematic areas, using work undertaken on the ground from signatories to the Paris City Hall Declaration.

The Paris City Hall declaration also pledges to strengthen the ongoing initiatives of cities and regions' networks, in particular the Compact of Mayors, the Covenant of Mayors, and the Compact of States and Regions.

## WHAT THE COP21 SAID ABOUT CITIES AND REGIONS

The Paris Agreement recognises the important role of these non-signatories in addressing climate change, and encouraged them to:

- scale up their efforts and support actions to **reduce emissions**;
- **build resilience** and decrease vulnerability to the adverse effects of climate change; and
- uphold and promote regional and international **cooperation**,

indicating that by doing so subnational governments will help guarantee the success of national pledges and improve the opportunities and health of their citizens.

## INTERNATIONAL COOPERATIVE ORGANISATIONS

Several collaborative **global networks of cities and other subnational jurisdictions** have been created for the express purpose of taking action on climate change. A primary benefit of these groups is knowledge sharing about both climate mitigation action, such as innovative financing mechanisms for renewable energy and economic opportunities in a low-carbon world, and climate adaptation, such as water resource management and disaster risk reduction.

A few of the most prominent groups are summarised in the table below. They are not mutually exclusive; many jurisdictions belong to more than one group.

GROUP/WEB ADDRESS	MEMBERSHIP AND GOALS
C40 Cities <a href="http://www.c40.org/">www.c40.org/</a>	A network of 83 megacities cities, covering 25% of global population, committed to addressing climate change. Goals are set by individual cities, with reporting facilitated by a common mechanism called the Carbon Disclosure Project, which also provides a protocol for business to report carbon emissions. The Cities of Melbourne and Sydney are members of C40.
Carbon Neutral Cities Alliance <a href="http://usdn.org/public/page/13/CNCA">usdn.org/public/page/13/CNCA</a>	A collaboration of about 20 international cities committed to achieving aggressive long-term carbon reduction goals and striving for carbon neutrality. The alliance provides municipal leaders with a detailed synthesis of the processes, strategies, practices, tools, and institutional structure used by leading-edge cities worldwide to plan long-term, deep reductions in carbon emissions. The Cities of Adelaide, Melbourne and Sydney are members.
The Climate Group <a href="http://www.theclimategroup.org/">www.theclimategroup.org/</a>	A coalition of 27 global subnational governments and 10 Chinese affiliates specialising in catalytic, high-profile climate and energy initiatives with business and regional governments, with the goal of creating prosperous, sustainable 'net-zero' emissions societies. Leading this work is the group's States & Regions Alliance - a network of 35 governments from six continents, which collectively account for 354 million people, 12% of global GDP and 2.9 gigatons of CO <sub>2</sub> emissions. The Australian states of New South Wales, Queensland, South Australia, Victoria, as well as the Australian Capital Territory are members.

<p>Compact of Mayors  <a href="http://www.compactofmayors.org/">www.compactofmayors.org/</a></p>	<p>The Compact of Mayors was launched by the UN with the leadership of many of the world's global city networks. The Compact establishes a common platform to capture the impact of cities' collective actions through standardized measurement of emissions and climate risk, and consistent, public reporting of their efforts. Thirteen local jurisdictions in Australia are members, including Adelaide, the ACT, Hobart, Melbourne, Perth and Sydney.</p>
<p>Compact of States and Regions  <a href="http://www.theclimategroup.org/project/compact-states-and-regions">www.theclimategroup.org/project/compact-states-and-regions</a></p>	<p>The Compact of States and Regions is a commitment by several global state and regional government networks to provide an annual assessment of their commitments (i.e. GHG reduction targets) and progress towards those commitments (i.e., GHG inventory data) to support international climate governance processes. In Australia, the ACT and South Australia are signatories.</p>
<p>Covenant of Mayors  <a href="http://www.covenantofmayors.eu">www.covenantofmayors.eu</a></p>	<p>The Covenant of Mayors for Climate &amp; Energy is a European group bringing together thousands of local and regional authorities voluntarily committed to implementing EU climate and energy objectives on their territory. New signatories pledge to reduce CO<sub>2</sub> emissions by at least 40% by 2030 and to adopt an integrated approach to tackling mitigation and adaptation to climate change.</p>
<p>ICLEI  <a href="http://www.iclei.org/">www.iclei.org/</a></p>	<p>Also known as <i>Local Governments for Sustainability</i> this is a network of more than 1,500 cities, towns and regions around committed to building a sustainable future. Together, ICLEI influences over 20% of the world's urban population. Over 40 Australian City Councils and organisations are members of ICLEI, including the ACT and the Cities of Adelaide, South Perth, Sydney.</p>
<p>Under 2 Coalition  <a href="http://under2mou.org/">under2mou.org/</a></p>	<p>An agreement that articulates the shared goal of 135 subnational jurisdictions worldwide of limiting GHG emissions to 2 tons per capita, or 80-95% below 1990 level by 2050. Collectively, signatories represent 32 countries, six continents, more than 783 million people, and \$21 trillion in GDP, equivalent to more than a quarter of the global economy. South Australia is a signatory.</p>

## INTRA-NATIONAL COOPERATIVES

Substantial cooperative action is also taking place between subnational governments within the same country, or neighbouring countries.

By 2011, 35 of the states in the USA had completed climate action plans, 3 were in the midst of writing them, and 24 states had adopted emissions reduction targets. Further, 1,044 cities had signed the U.S. Conference of Mayors Climate Protection Agreement (Thomson & Arroyo 2011).

Most notably these joint intra-national climate programs have taken the form of emission cap and trade agreements, leadership agreements related to specific emission targets and integration of clean energy sources into the grid, region-city pacts for collaborative work on emissions in the building, transport, renewable energy and waste sectors, and initiatives specifically aimed at joint, networked efforts in low-carbon transport.

Some of these intra-national collectives are described briefly below, with more details provide in Appendix A.

The **Pacific Coast Collaborative (PCC)** is an alliance for cooperative action, a forum for leadership and information sharing, and serves to provide a common voice for issues facing Pacific North America. The US states of Alaska, British Columbia, California, Oregon and Washington are members of the PCC. In June 2016, PCC regional leaders signed the Pacific Coast Climate Leadership Action Plan (PCC 2016a) outlining increasingly bold goals for decisive action in light of the COP21 global climate agreement. Notably, a **regional-city pact** was signed in June 2016 by the U.S. governors of California, Oregon and Washington, and the Environment Minister of British Columbia, Canada together with mayors of six major US West Coast cities. Called the *Pacific North America Climate Leadership Agreement*, (PCC 2016b), the compact focuses on four main areas of collaboration: low-carbon buildings, low-carbon transportation, low-carbon energy systems, and low-carbon waste.

In 2010, the **Transportation and Climate Initiative (TCI)** was founded as a regional US alliance of 11 states and the District of Columbia (Washington, DC) with the goal to develop the clean energy economy while reducing oil dependence and GHG emissions from the **transportation sector**. The TCI is directed by the leaders of transportation, energy, and environment agencies of the member jurisdictions. Participating TCI governments are taking action in four core areas: clean vehicles and fuels, sustainable communities, increased freight efficiency, and innovative information technologies. It is estimated that clean transportation policies could cut GHG emissions between 29 to 40% in the TCI region by 2030, whilst resulting in net cost savings of up to \$72.5 billion over 15 years for businesses and consumers, improving public health and generating tens of thousands of new jobs.

The **Regional Greenhouse Gas Initiative (RGGI)** is a **mandatory market-based program** in the United States to reduce GHG emissions formed from nine north-eastern states that together represent about 40 million people. The collective reports that in the period 2005 to 2013, their regions experienced a reduction of over 40% in power sector CO<sub>2</sub> emissions since 2005, while the regional economy has grown 8% adjusted for inflation. As of March 2016, RGGI auction proceeds have raised a total of \$2.4 billion (USD). States reinvest these monies in consumer benefit initiatives, including energy efficiency, renewable energy, direct bill assistance, and GHG abatement programs.

The **Western Climate Initiative (WCI)** is a non-profit corporation formed to provide administrative and technical services to support the implementation of **GHG emissions trading programs**. Current WCI members are California in the United States, and the provinces of Québec, British Columbia, Manitoba, and Ontario in Canada. On 1 January 2014, the California Cap and Trade Program and the Québec Cap and Trade System officially linked, and in May 2016, Ontario passed cap and trade legislation, planning to join the California-Québec market in 2018. California has instituted an economy-wide cap on major sources of GHG emissions; it is estimated that these account for about 85% of California's emissions. Proceeds from allowance auctions are reinvested in California for projects that further reduce GHG emissions, amounting to over 4 billion USD since program inception.



# KEY JURISDICTIONAL STATISTICS

Australian subnational jurisdictions vary greatly, in size, population, density, carbon footprint, gross regional product, heavy industrial and agricultural activity, and GHG emissions profile. Pathways to low-carbon economies will depend on these factors, with different approaches required in different areas at different points in time.

While each subnational jurisdiction will have its own path to de-carbonised societies, all can learn from one another, and indeed are dependent on one another. Food, energy and minerals are largely produced outside municipal areas, whereas manufacturing, services and knowledge generation are primarily located in cities. A large fraction of GHG emissions are generated to create products that are then consumed elsewhere, either domestically or through export. This distinction between and interconnectivity amongst cities and regions means that while subnational jurisdictions will face different challenges in reducing GHG emissions, they must work together to achieve the best outcomes.

This section provides a snapshot of the jurisdictions of the Roundtable in terms of their size, current carbon footprint and emissions profile, and on key current indicators of successful low-carbon economies. Data for these statistics were provided by the survey, or from other sources, as noted.

## RELATIVE SIZE OF JURISDICTIONS

Size varies widely over the jurisdictions of the Climate Action Roundtable, which includes all Australian states, territories, and capital cities. The disparity is so large that, in Figure 2 below,

a logarithmic representation has been used, so that every labelled increment is 10 times larger than the previous. Total population is indicated on the horizontal axis, while population density is plotted vertically. For consistency, data are taken from the Australian Bureau of Statistics (Dec 2015 estimates) and Geoscience Australia for states and territories, and from information provided in the survey from capital cities.

New South Wales is the most populous of the major Australian subnational jurisdictions, followed by Victoria and Queensland. Not surprisingly, capital cities have the highest density of population, topped by City of Sydney, followed by the Cities of Perth, Adelaide, Melbourne, Brisbane and Darwin. (With the exception of Brisbane, most cities are reporting numbers for relatively small central city councils, rather than for a wider metropolitan area.) The Australian Capital Territory (ACT) and Tasmania occupy the mid-range between these two groups, with the ACT more population dense than City of Hobart. The geographically large areas of the Northern Territory, Western Australia and South Australia, coupled with their moderately sized populations, result in their substantially smaller population densities compared to other jurisdictions.

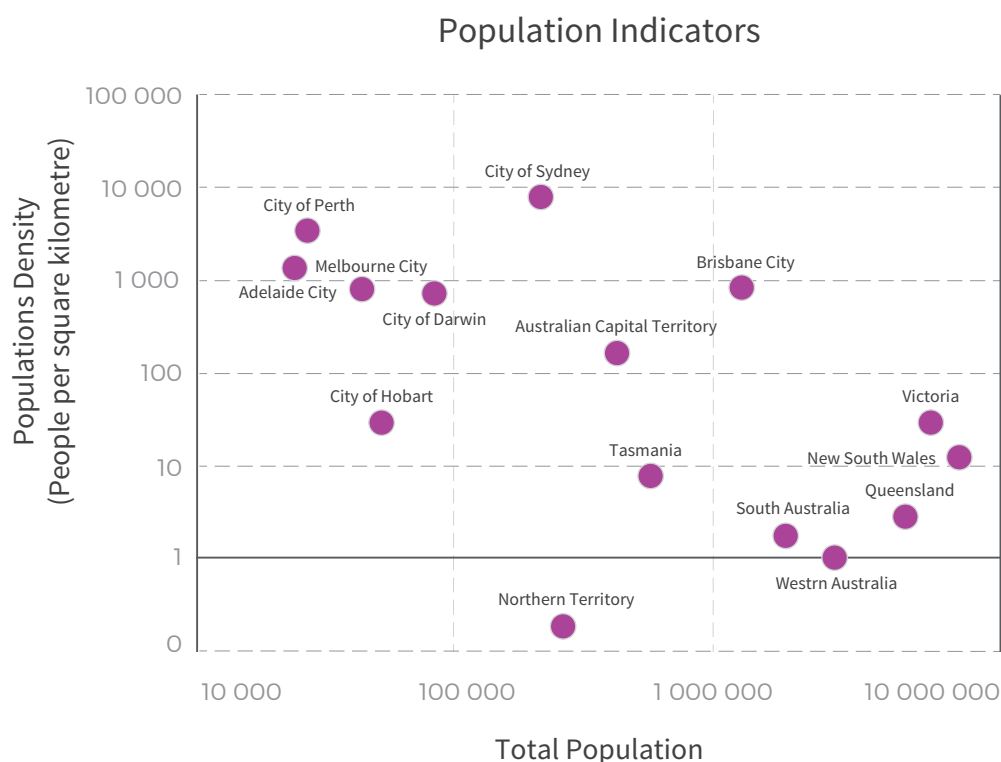


Figure 2: Population indicators for Australian regions and cities: Total population and density

## TOTAL CARBON FOOTPRINT

Another way to measure size, particularly relevant for this Report, is to consider the carbon footprint of each jurisdiction. As Australian states and territories are required to report this statistic annually, comparably determined measures are readily available for all eight of these regions from the National Greenhouse Gas Inventory (NGGI). In the NGGI, GHG emissions are measured in (metric) tonnes of CO<sub>2</sub>-e, that is, of “equivalent carbon dioxide,” which is the international-recognised standard for emissions reporting.<sup>1</sup>

Carbon footprints for regions are calculated in one of two ways, one excluding and one including emissions from direct **human-induced land use, land use change and forestry (LULUCF)** activities. Emissions from the LULUCF sector are distinct from those attributed to the agricultural

sector, and may be positive or negative, depending on whether the activity increases GHG emissions, or causes them to be removed from the atmosphere. For example, deforestation causes the stock of carbon stored in the land (in trees) to be released into the atmosphere where it increases global warming. Reforestation does the opposite, and so is a source of “negative” emissions, sometimes called a “sink.”

The chart below (Figure 3) shows the total greenhouse gases emitted by each jurisdiction in 2014 in tonnes of CO<sub>2</sub>-e, according to NGGI reporting (Commonwealth of Australia, 2016). Emissions and removals of greenhouse gases resulting from direct human-induced LULUCF activities are not included in the plot. Heavily populated regions and those with large carbon-intensive fossil fuel powered industries are more likely to have large carbon footprints.

<sup>1</sup> Greenhouse gases are responsible for radiative (or climate) forcing, that is for causing a difference between the amount of sunlight that is absorbed by the Earth and the amount that is radiated back into space. As carbon dioxide is responsible for the largest share of the radiative forcing of all anthropogenic emissions, the effect of other greenhouse gases is often calculated as the amount of carbon dioxide that would create a similar level of forcing, which is denoted as CO<sub>2</sub>-e.

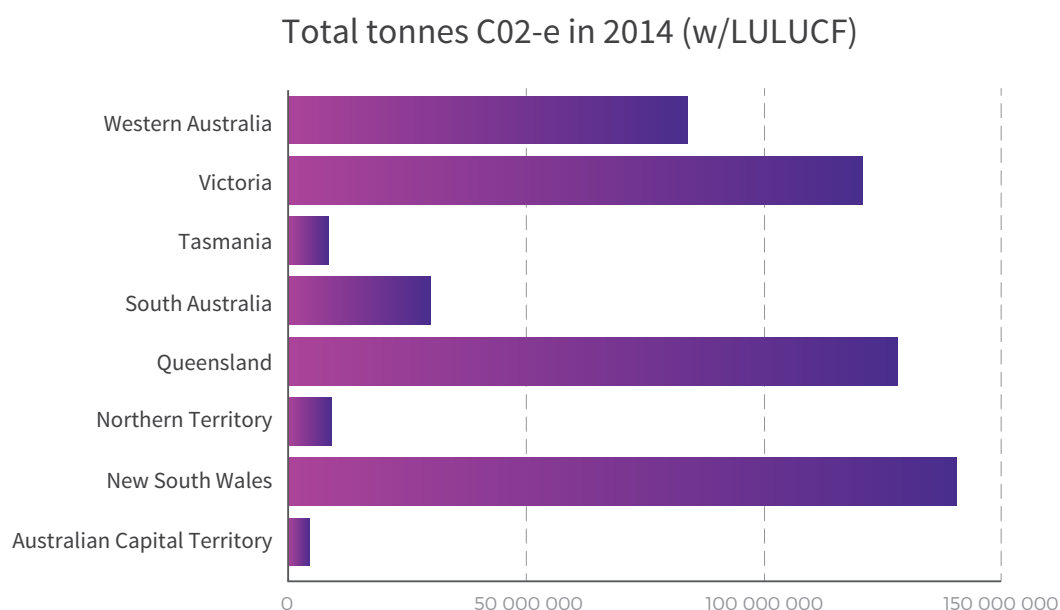


Figure 3: Total GHG emissions from 2014 NGGI (excluding LULUCF). Scope 2 included for ACT

The Australian Capital Territory tracks so-called Scope 2 emissions from electricity that is used inside the ACT but generated elsewhere; these emissions have been included in the ACT carbon footprint. For all other states and territories, Scope 1 energy sources of greenhouse gases are indicated in the chart.

It is useful to look at the representation of carbon footprint that excludes LULUCF emissions for several reasons. They are difficult to estimate

and can potentially be reversed, which is to say that land-based accumulated carbon stocks are not permanent. Naturally occurring forest fires, for example, place carbon stored in trees back into the atmosphere. **Carbon forestry** is also not a long-term solution, as more trees must be planted every year to keep stable levels of annual abatement.

On the other hand, deforestation is a significant contributor to increasing atmospheric CO<sub>2</sub> levels, and thus to global warming. For this reason, carbon footprints including emissions from the LULUCF are also valuable to consider. In Figure 4, the *ratio* of LULUCF sector emissions to all other emissions is shown for every Australian State and Territory in the 2014 reporting year.

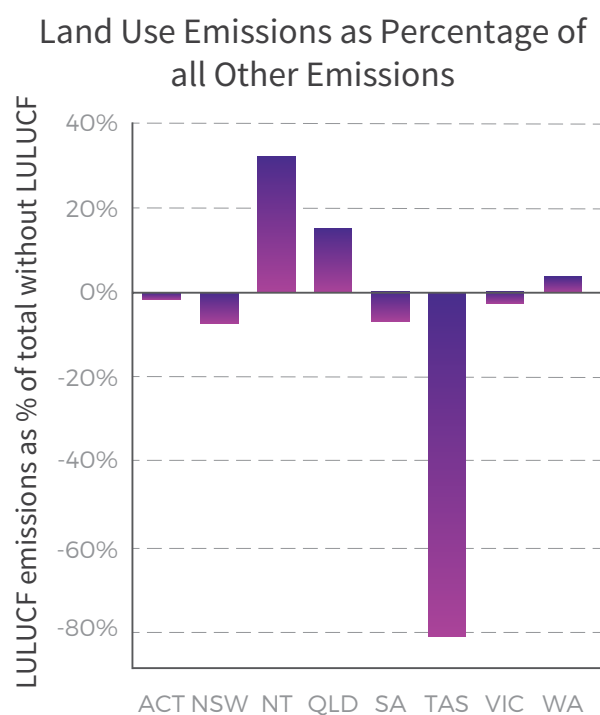


Figure 4: Ratio of LULUCF emissions to all other emissions from 2014 NGGI

The Northern Territory, Queensland and Western Australia report positive LULUCF emissions that are 32%, 15% and 3% of their non-LULUCF emissions, respectively. This means that in 2014, land use and forestry in these areas contributed to global warming. The ACT reported a small negative contribution to emissions from LULUCF. The other four regions, New South Wales, South Australia, Tasmania and Victoria report negative LULUCF emissions, which serve to decrease global warming and thus offset a proportion of their non-LULUCF emissions for that year, by amounts of 7%, 7%, 81% and 2%, respectively. LULUCF emissions tend to vary greatly year by year.

Capital cities are beginning to assess their own carbon footprints. In some cases this can be fraught with difficulties that are not experienced at a state level because the geographical, jurisdictional, economic and transport and larger metropolitan areas of central cities do not coincide. In the absence of a standard and complete reporting method used by all Australia capital cities, their total GHG emissions are not reported here. However, the *Global Protocol for Community-Scale Greenhouse Gas Emission Inventories* (the GPC) is emerging as one global standard for city-level emissions reporting.

One characterisation of the total carbon footprint that varies dramatically with the size of the subnational jurisdiction is the relative size of **Scope 2** emissions. Scope 1 emissions from the energy sector are those directly produced in the prescribed region. Scope 2 emissions represent the GHG emissions from the generation of electricity consumed in the region. Scope 2 emissions therefore represent the emission impact of electricity consumption in a region, rather than electricity generation. The sum of all Scope 2 emissions from all regions is equal to the direct (Scope 1) emissions from electricity generation in all regions.

The NGGI uses Scope 1 accounting but also records Scope 2 emissions for all Australian states and territories. The local jurisdictions of Adelaide City Council and the Cities of Melbourne

and Sydney have estimated their direct Scope 1 emissions from the transport and stationary energy sectors as well as their Scope 2 emissions. In Figure 5 below, the *ratio* of Scope 2 (purchased electricity) emissions is shown as a percentage of Scope 1 energy emissions (stationary and transport) for those subnational jurisdictions for which sufficient data are available to compute this particular statistic. Data are taken from the 2014 NGGI where available; otherwise data are taken from Roundtable survey results.

The ACT has the largest relative percentage of Scope 2 emissions of all Australian states and territories, since most of its electricity is purchased from other states. In calculating the carbon footprint of the ACT for its own policy-making, the ACT has decided to count Scope 2 emissions directly in its carbon footprint, thereby taking responsibility for the emissions produced in generating the electricity it purchases from others. South Australia has done the same.

As can be seen figure 5, for the ACT, and the Cities of Adelaide, Melbourne and Sydney, emissions associated with the electricity purchased from others is larger than the direct energy emissions generated in their jurisdictions. Despite a significant component of transport emissions **in these small, urban jurisdictions, emissions from purchased electricity dominate.**

In New South Wales and Victoria, Scope 2

Scope 2 stationary energy as percentage of all Scope 1 energy

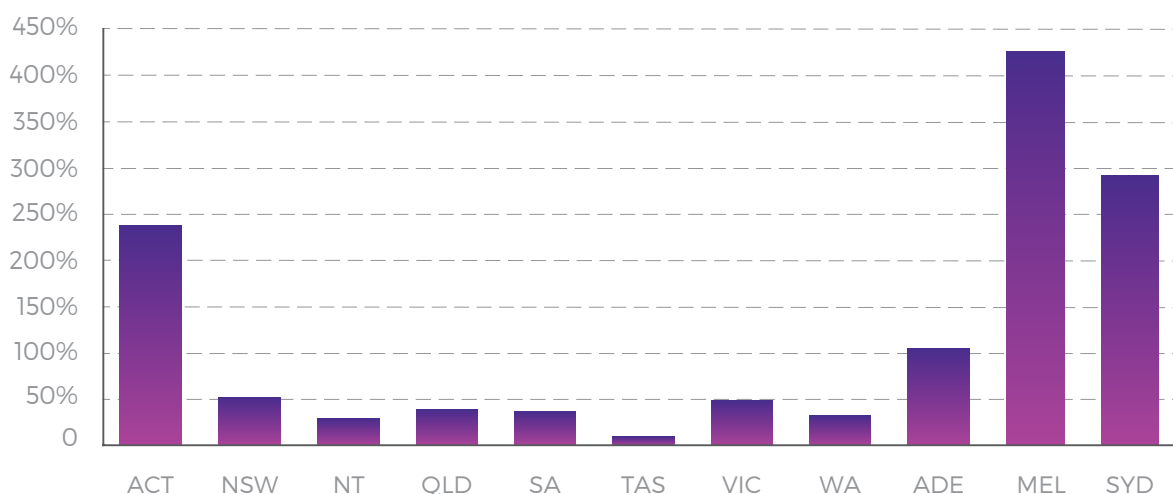


Figure 5: Importance of Scope 2 stationary energy emissions

emissions are about half of the emissions directly produced in the state from the stationary and energy and transport sectors. Larger states and territories generally have a lower ratio of Scope 2 emissions. The exception to this rule is the relatively small state of Tasmania, which is rich in renewable energy that supplies much of its own needs. Nevertheless, all areas are interconnected, as all states and territories purchase at least some of their electricity from out-of-state. Seen from a Scope 2 accounting perspective, states that produce, use and sell renewable energy, lower not only their carbon consumption, but indirectly that of their fellow jurisdictions as well.

## CARBON EMISSION PROFILES

From the data contained in the 2014 NGGI, emission profiles can be created for each Australian state and territory. These are shown in Figure 6 below, in which emissions from each sector are expressed as a percentage of the total emissions (without LULUCF) for each jurisdiction.

For every jurisdiction save Tasmania, emissions associated with stationary energy are by far the largest portion of the profile. For this reason, cooperative work on low-carbon, renewable energy sources is likely to have the largest impact on jurisdictional carbon footprints. With its large component of renewable energy, Tasmania has roughly equal emission contributions from stationary energy and agriculture. Also unique to Tasmania is the large offset it receives from the large emission “sink” associated with its LULUCF sector in 2014, and the fact that industrial emissions form a higher fraction of its profile than for any other region.

Emissions from industrial processes make up a significant piece of the emission profiles of especially New South Wales, South Australia, Western Australia and Tasmania. Transport composes a sizeable profile fraction for all states and territories, and agriculture is an important component for every region except the ACT. The Northern Territory and Queensland are challenged by the relatively large components of positive emissions from their LULUCF sectors.

As mentioned, the emission profiles for some city centres and municipal regions can be difficult to

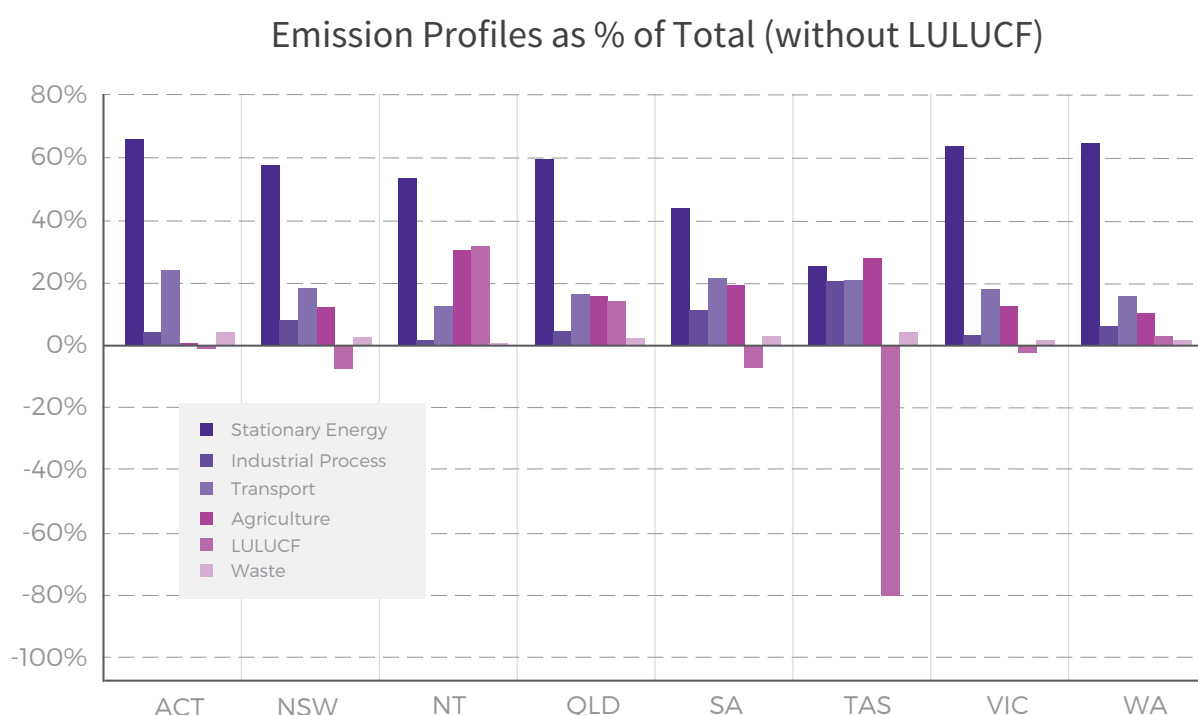


Figure 6: State and Territory emission profiles. Data from 2014 NGGI, plus Scope 2 electricity for ACT

assess, but estimates indicate that collectively 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. In Australia, progress is being made. The cities of Adelaide, Brisbane, Darwin, Hobart, Melbourne and Sydney have made estimates for some components of their emissions profiles, while the City of Perth expects to do so within a year.

The Cities of Adelaide, Melbourne and Sydney also estimate Scope 3 emissions, that is, other indirect emissions that can include those from the extraction and production of purchased materials and fuels, electricity-related activities not covered in Scope 1 (such as losses due to transmission and distribution), outsourced activities, waste disposal, and so forth.

## STRONG LOW-CARBON ECONOMIES

Healthy low-carbon economies are those that have strong performing economies and also produce a relatively large Gross State Product (GSP) for the size of its carbon footprint. There are many ways to measure the strength of a state economy, including GSP, GSP per capita, diversity of goods and services,

growth trends, export profile, and adaptability and resilience to change to name a few. Such an analysis is beyond the scope of this report. What can be computed from readily available data is the GSP generated in Australian states and territories for every tonne of CO<sub>2</sub>-e emissions. This is shown in Figure 7 below. Data are taken from the 2014 NGGI (with Scope 2 electricity emissions added for the ACT), and GSP data from Australia Bureau of Statistics for June 2015.

For the ACT, (Scope 2) emissions from purchased electricity are added to GHG emissions emitted with the Territory. Nevertheless, the ACT has the most carbon efficient economy of Australian states and territories, producing around \$8,400 of GSP for every tonne of CO<sub>2</sub>-e. In part, this is due to the relative scarcity of heavy industry or agriculture in the Territory. Other states and territories are roughly comparable in the carbon efficiencies of their current economies, with the Northern Territory and Queensland somewhat less carbon efficient.

In a transition to a low-carbon economy, the overall goal is that each bar on this chart moves rapidly and substantially upward, whilst keeping local economies strong. This will happen to the extent that energy generation and consumption, including transport, is dominated by low-carbon

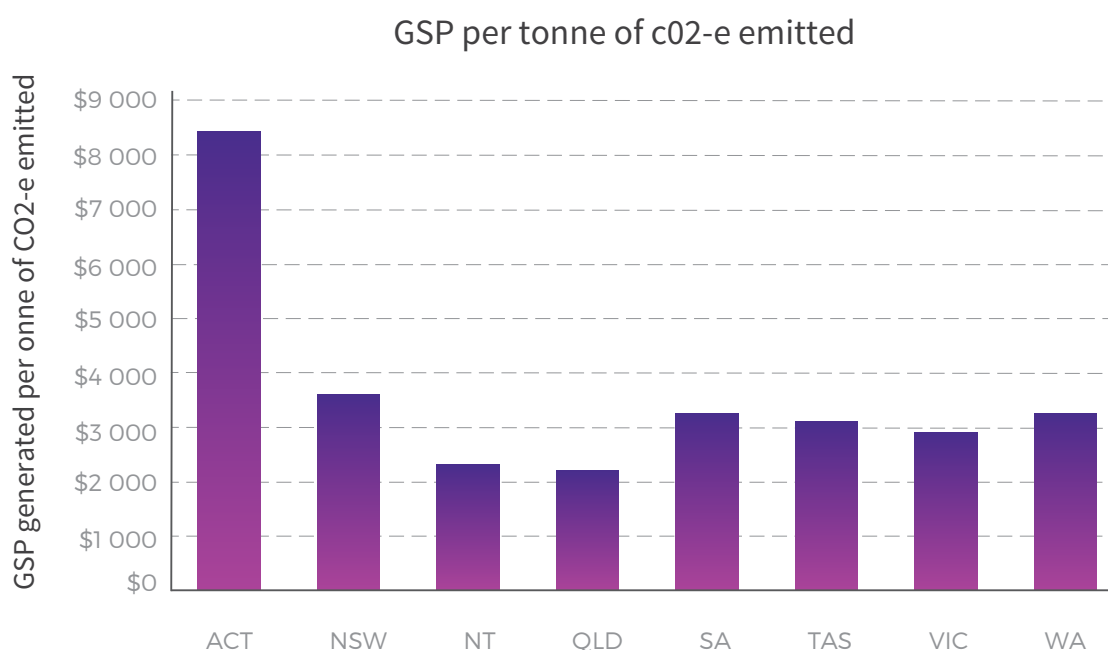


Figure 7: Measure of the Carbon Efficiency of State and Territory Economies

sources, energy efficiency is embraced, and goods and services, including the disposal of waste, are provided in a low-carbon manner. That said, as the extent of future climate change depends on the absolute amount of GHG emissions released, energy efficiency, or energy productivity as it is sometimes called, is insufficient as a single measure of success. The absolute, cumulative, **global carbon footprint remains the key climate indicator.**

Of course, a healthy low-carbon *society* (as opposed to low-carbon economy) is one in which “green” GSP is spread equitably amongst its jurisdictional citizens. Examination of equitable distribution of economic wealth is beyond the scope of this report.

Central city districts have economies that are not so easily confined to their jurisdictional boundaries. Nevertheless, research by the City of Sydney undertaken with Deloitte and using the [Kinesis CCAP City tool](#), for example, indicates that the economy of the local government area increased by 27% during the period between 2006 and 2014, whilst at the same time GHG emissions for the local government area decreased by 19%. This is indicative of the **decoupling of economy and emissions** that is necessary in healthy low-carbon economies.

Studies indicate that an Australia transition to a net-zero emissions society by 2050 can be achieved with a growing domestic product and export profile, increase in jobs, and strong primary industries.

The [Deep Decarbonization Pathways Project \(DDPP\)](#) is a collaborative initiative of independent researchers from 15 different countries, including Australia, developing preliminary plans illustrating how each individual nation could simultaneously transition to a low-carbon society, meet its development goals, and together hold global warming below the internationally-agreed 2°C limit by decarbonizing by 2050. Participating countries represent about 75% of global GHG

emissions. DDPP’s focus is on technical feasibility, and the recognition that societal health, economic development, and the environment are inextricably linked. Although each country will have different decarbonisation profiles, they share three common points for national energy systems: ambitious **energy efficiency** and conservation; generation of **low-carbon electricity**; and electrification and **fuel switching** in all sectors. In addition for Australia there is a fourth pillar: **reducing non-energy emissions in industry and agriculture.**

The Australian DDPP model, which is grounded in economic modelling, and supported by sectoral analysis of technical emissions reduction potential, shows that deep decarbonisation can be achieved while **real gross domestic product (GDP) grows at 2.4% per year** on average, while **exports grow at 3.5% per annum**. Whilst electricity prices per MWh rise modestly overall, electricity bills are lower by as much as 30%, because households and industries have become more energy efficient. The DDPP work indicates that Australia’s vast renewable energy resources, continued strong primary industries, potential for geological sequestration and vast land resources available for carbon forestry, give the country **distinct opportunities in a decarbonised world.**

These new low-carbon opportunities are linked to **Australian jobs**. A recent study (CCA 2016) compared two scenarios, a standard renewable energy uptake path of 34% by 2030, and an accelerated renewables path of 50% by 2030 that is more indicative of total decarbonisation by 2050 and holding global warming under 2°C. Both paths create nationwide employment opportunities in every state and territory, but the more rapid uptake of renewables results in 50% more employment in the electricity sector. The jobs, most of which would be new to the Australian economy, would be in construction and installation, and utility scale renewable power in remote and regional Australia, and would be expected to increase employment in other sectors as well in these areas.



# ASPIRATIONS, POTENTIAL AND SUCCESSES

In order to understand the commonalities of intent and current action, as well as sectoral areas with potential to drive climate action toward a low-carbon economy, Roundtable members were asked to articulate their aspirations, including for their own operations, provide examples of success stories in their own jurisdiction, and nominate sectors most likely to drive climate action. This section presents the results of the Roundtable survey, and as such is not intended to be a comprehensive analysis.

## ROUNDTABLE MEMBER CLIMATE ASPIRATIONS

Roundtable members have set high aspirations for climate action in their jurisdictions. Some centre on reducing GHG emissions in their own governmental operations, as described in the next section. Broader goals of Roundtable jurisdictions include overall emissions targets in their region, targets for renewable energy uptake, and facilitating sustainable transport and climate responsive built form. A few of these are discussed below.

The Tasmanian Government boasts one of the greatest reductions of net GHG emissions in the world (over 90% on 1990 levels in 2014), partly because over 90% of its electricity supply is from large-scale hydro and other renewable sources, but primarily because it offsets over 80% of its emissions with carbon sinks due to land use and forestry. Given this, it is currently reviewing its Climate Change Act and developing a new 5-year climate change action plan that will focus on continued emission reduction and climate change adaptation.

The ACT, South Australia, and Victoria have all committed to becoming **carbon neutral** by

2050, as has the City of Sydney, whilst the City of Melbourne has pledged to do so by 2020 and the City of Adelaide by 2025. Combined, **these zero carbon commitments encompass over one-third of the total Australian population.**

Roundtable members support a variety of other **intermediate emission reduction** targets:

- ACT: 40% legislated reduction in GHG emissions (on 1990 levels) by 2020;
- Adelaide City Council: 35% reduction of GHG emission (on 2006–07) by 2020;
- Brisbane City Council: average household emissions from energy, waste and transport will be less than 6 tonnes CO<sub>2</sub>-e by 2031;
- Hobart City Council: 17% GHG emission reduction (on 2010 levels) by 2020;
- Hobart City Council: 35% energy consumption reduction (from 2010 levels) by 2020;
- City of Perth: 30% reduction in city-wide GHG by 2030 (compared to 2006 for residential and 2012 for corporate emissions);
- City of Sydney: 70% GHG emission reduction (on 2006 levels) by 2030,

and **renewable energy targets**:

- ACT: 100% renewable electricity supply by 2020;

- City of Melbourne: 25% of energy from renewable sources by 2018;
- City of Perth: 20% of city-wide energy from renewable or low-carbon sources by 2030;
- Queensland: Credible pathway to achieving 50% renewable energy by 2030;
- South Australia: 50% renewable energy generation target by 2025; and
- City of Sydney: 50% renewable electricity supply by 2030.
- Victoria: 25% renewable electricity generation by 2020 and 40% by 2025.

City of Darwin has also expressed the aspiration of assisting in the reduction of its community's carbon footprint, and the City of Hobart is investigating a Renewable Energy Target as part of its review of its climate change strategy.

For context, as a nation, Australia currently has no carbon-neutral target, has an intermediate target of reducing national emissions by 26-28% on 2005 levels by 2030, and a renewable energy target of 33,000 GWh of large-scale renewable energy generation by 2020, approximately equivalent to 23.5% of Australia's electricity generation in that year.

## DRIVERS OF THE LOW-CARBON TRANSITION

In the pre-meeting survey, Roundtable members were asked to think about sectoral areas with potential for their own jurisdictions in a transition to a low-carbon society, and to report on efforts to directly reduce greenhouse gases in their own governmental operations.

### KEY SECTORAL AREAS PERCEIVED TO DRIVE LOW-CARBON CHANGE

Specifically, jurisdictions were asked to choose up to five sectors that are most likely to hold promise in driving a transition to a low-carbon society in their jurisdictions. Their responses are displayed in Figure 8 below, with the percentage of responding jurisdictions choosing a sector indicated by the length of the bar.

While all of these sectors will be required to move Australian subnational governments to low- or zero-carbon societies, there was broad Roundtable consensus about those that were most critical to the transition.

#### Sectors with Most Low-Carbon Potential

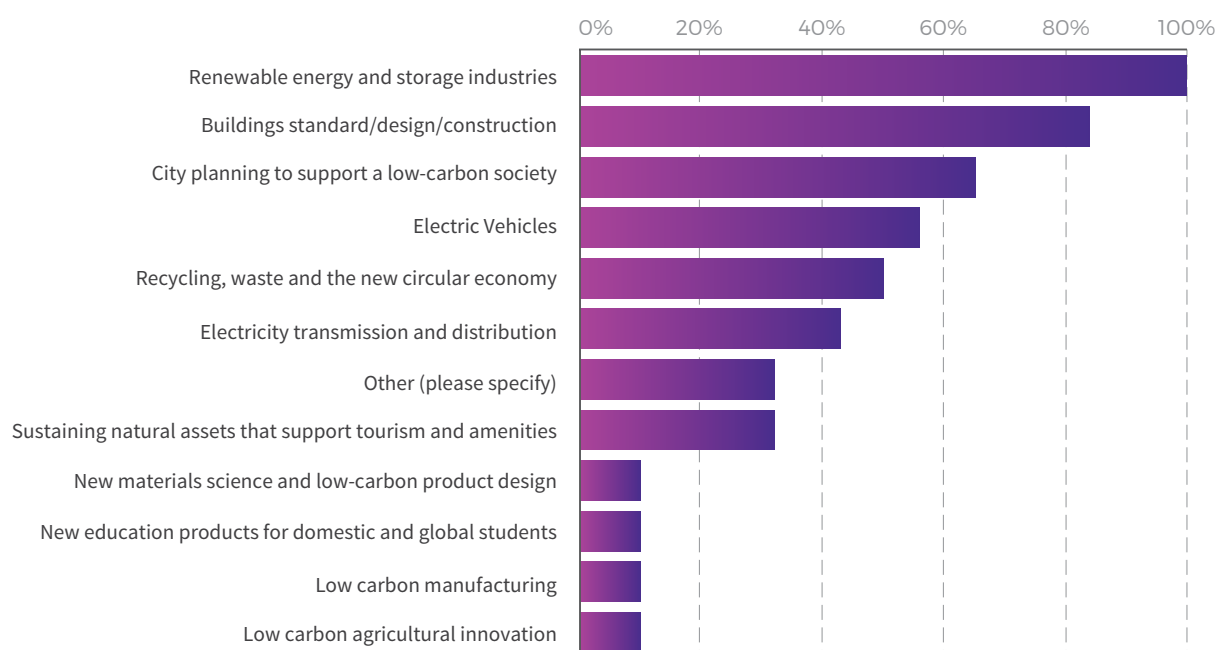


Figure 8: Sectors with low-carbon potential: % of Roundtable survey respondents electing

Strikingly, 100% of the respondents indicated that renewable energy and storage industries were key to a low-carbon transition. More than 80% also elected building standards, design, construction, while two-thirds selected city planning more generally. Over half of jurisdictions consider electric vehicles, or zero emissions vehicles more generally, as key. Also regarded as important were recycling, waste and the circular economy, and electricity transmission and distribution.

Survey participants also nominated sectors to drive the low-carbon transition that did not appear on the original list, namely: **carbon forestry** and **energy efficiency** garnered two votes apiece, while one respondent chose community engagement.

## EMISSIONS FROM GOVERNMENTAL OPERATIONS

One area in which subnational jurisdictions have considerable control and ability to show leadership is in reducing the carbon emissions from their own governmental operations. Many members of the Climate Action Roundtable are leading in this way.

**Hobart City Council** has reduced GHG emissions from its own governmental operations by 75% from 2000 to 2010, largely through actions taken at waste treatment facilities to reduce methane emissions. The City has committed to a further GHG reduction of 17% from the 2010 levels by 2020, and a target of 35% reduction in energy use over this period. To date, emissions have been reduced by 12% and energy use by 26% since 2010, with realised savings of at least \$1m per annum. Some of the measures credited with producing these successes in City of Hobart operations include use of more fuel efficient vehicles, minimising distance travelled in waste collection, replacing 80 Watt mercury vapour lights with 18 Watt LED lights in suburban streets, upgrades to heating and cooling systems, and installation of solar panels.

The **ACT** Carbon Neutral Government Framework underpins the government's target of being

carbon neutral in its operations by 2020. Since 2013, emissions by the ACT Government, an organization of 20,000 employees, have reduced by 19%.

**Adelaide** City Council also has a target of zero net carbon emissions from its operations by 2020. Since 2009-10, energy efficiency projects have reduced energy use in the Council's own operations by more than 15%, saving Council in excess of \$800k/year in recurring costs. The Council's off-street car park business reports 50% reductions in operational electricity use in two car parks following recent LED light upgrades.

The City of **Perth** Council has set two targets for itself: to reduce by 30% emissions from operations by 2030, and to source 25% of the City's operational energy from renewable or low carbon sources by that date.

The **Brisbane** City Council has been purchasing 100% Green Power since 2010 for its own operations and has set a target that all of its Council operations to be carbon-neutral by 2017.

City of **Darwin's** Climate Change Action Plan outlines initiatives to reduce their own carbon footprint in city operations.

The **Tasmanian** Government has instituted monitoring and reporting of agency energy and transport use, and is improving energy efficiency through capital upgrades, behaviour change, and vehicle selection.

The **Victorian** Government is developing a whole-of-Government pledge to reduce emissions from its operations through reduced energy use in buildings and appliances, and changes to vehicle fleet, waste management, and procurement.

A **South Australian** energy efficiency investment program has been developed that mandates that all agencies identify and implement energy efficiency upgrades in government-owned buildings. The South Australian Government will source about 25% of its power from dispatchable renewable energy providers that utilise technology such as battery storage and electricity generation from biomass.

The State will reduce emissions from its own fleet by increasing the proportion of low emission vehicles (LEVs) in the Government fleet to 30% over the next three years.

City of **Sydney** applies its low-carbon city targets to its own Council operations as well. Through energy efficiency retrofits, LED lighting upgrades and solar PV installations, the City has already achieved more than 25% energy savings on 2006 levels. The City of Sydney was the first local council to be recognised as carbon neutral in 2011, a practice in place since 2007.

The City of **Melbourne** is committed to maintaining carbon neutrality of its operations. More broadly, the City is finalising a five-year Emissions Reduction Plan that explores the use of a science-based emissions reduction target and outlines seven priority areas for action.

## CURRENT ROUNDTABLE SUCCESS STORIES

One of the benefits of cooperative climate action among Australian subnational governments is the opportunity to learn from proven successes in other jurisdictions. A few “success stories” are presented below from Roundtable members.

**South Australia** acted early on renewable energy policy and has achieved high rates of renewable energy penetration with 41% of its electricity generated from renewable sources in 2014/15. This was achieved through a premium feed-in tariff mechanism to support the installation of solar photovoltaic systems and by ensuring that regulatory frameworks were supportive of renewable energy. South Australia’s planning guidelines for wind farms provides certainty to the community and investors about the development of wind farms, for example by specifically allowing a wind farm on Crown Land to co-exist with the activities of pastoral leaseholders. Legislation to facilitate expedited access to pastoral land for solar energy projects has also been enacted.

In **Victoria**, state-based feed in tariffs have driven significant uptake of residential solar PV

in the last ten years with over 278,000 systems already installed, with a combined capacity of over 870 MW. More than 1.5 million Victorian households have benefited from energy efficiency measures through the Victorian Energy Efficiency Target (VEET) Scheme. The scheme will generate Victorian Energy Efficiency Certificates between 2016 and 2020 that represent total GHG emissions reductions of 30.2 megatonnes of CO<sub>2</sub>-e. The state is also running programs to assist small and medium businesses and vulnerable households to implement energy efficiency improvements and is soon to roll-out the Residential Efficiency Scorecard.

The **ACT** has used a large-scale reverse-auction process to progress its goals of 100% renewable energy by 2020 and GHG emissions reduced by 40% below 1990 levels in the same year. The government estimates that solar and wind energy secured through the reverse-auction process will account for around 70% of the emission reduction needed. To June 2016, the auctions have successfully secured 440MW of wind and solar capacity, with the nation’s lowest known prices. A further 200MW is currently being auctioned, supporting one of the world’s largest distributed battery storage rollouts. Benefits cited by the ACT government include attracting local and international renewables business, university courses sponsorship and research, and contribution to the ACT’s knowledge industry.

**Tasmania** has a strong focus on delivering energy efficiency programs with local government, households and businesses. This includes assisting low-income households, public housing tenants and aged care facilities to improve energy efficiency through a variety of measures, with a corresponding \$190 per year savings per household, on average. The State is also introducing a \$10 million energy efficiency loan scheme, which will provide no interest loans to households and small businesses to install energy efficient equipment and appliances. An education program is being developed for community sector professionals to assist clients to further reduce their energy use.

**Hobart** City Council has been engaged in climate action since 1999 and embedded climate change action across all its key corporate documents. Given the significant emissions reduction of 70% from 2000 to 2010 achieved through cogeneration at its landfill, coupled with the sourcing of Tasmania's electricity from renewable hydro, the City has focused its efforts on the energy sector. The City has shaped its emissions reduction program around a goal of a 35% energy reduction in 2010 levels by 2020. To date this has resulted in about \$1million in savings per year. The City's energy and greenhouse gas action is delivered through its Energy Savings Action Plan 2014 – 2017, and annual reporting.

In **Adelaide**, office-leasing policies introduced by the South Australian Government have contributed to more than 243,000m<sup>2</sup> of GBCA Green Star rated floor space between 2007 and 2013 in the City. Assessments encouraged energy efficient buildings with at least 4.5 Star NABERS Energy ratings. Through its Sustainable City Incentives Scheme, the City has seen a 26.4% increase in installed small-scale PV systems in only 10 months time.

The City of **Darwin** also reports an increase in the installation of rooftop solar. Since 2014, the City has installed about 100kW of rooftop solar panels every year.

The Better Buildings Partnership is a successful **Sydney** program working with institutional property firms that own or manage more than half of the premium commercial office buildings in the city centre. These firms have agreed to help the City of Sydney meet its target of 70% GHG reductions by 2030, and to date have already achieved 45% reduction within their own portfolio. The plan now is to replicate this model to the office tenants, and lower tier office buildings.

In April 2016, the City of **Melbourne**, together with other local governments, cultural and educational institutions, and private-sector corporations launched a competitive tender to purchase renewable energy through a group-purchasing model. The group is seeking to

purchase 110 GWh of energy from new, large-scale renewable energy facilities. It is estimated that this amount of renewable energy is sufficient to power 28,475 Melbourne households and will save up to 138,600 tonnes of CO<sub>2</sub>e each year, the equivalent of planting more than 160,000 trees annually. The tender evaluation is currently ongoing.

The **Brisbane** City Council lists landfill gas management, its public transport initiatives, and replacing 25,000 mercury vapour lights with energy saving bulbs in suburban streets among its most successful actions to reduce GHG emissions. Also cited is the acquisition of new bushland and protective zoning of current bushland to serve as “green lungs” for the City. More than 2 million trees have been planted, with increasing carbon storage within Brisbane.

In September 2015, City of **Perth** signed the Compact of Mayors, a global coalition of mayors and city officials committing to reducing local GHG emissions, enhancing resilience to climate change and tracking their progress publicly. Signing the commitment to the Compact commits the City to a number of obligations within a three-year timeframe. Currently, the City is working on the first year requirements, which include undertaking a Community Greenhouse Gas Emission Inventory and assessing the current and future climate hazards for the City. By the third year, the Perth will have undertaken a Greenhouse Gas Inventory, set emission reduction targets, and submitted a climate action plan that outlines how it will deliver its commitments.

# RISKS, BENEFITS AND CHALLENGES

Subnational governments must consider risks, weigh benefits and opportunities, and overcome challenges in order to assist their communities in transitioning to low carbon societies. Roundtable members were asked about their perceptions of each of these.

## RISKS

Risks and the possibility of adverse side effects are associated with any transition, including the one to low-carbon societies. Roundtable respondents to the pre-meeting survey chose up to three such possible downsides to low-carbon climate action; their responses are presented in Figure 9 below.

Nearly 70% of respondents chose the uncertainty induced by accelerated structural change as a major risk of a low-carbon transition. Over half listed increased energy costs for the community and business as a possible downside. More than one-third listed the possibility of increased business costs and possible adverse side effects from change that is poorly informed as risks to be managed.

## BENEFITS

Notwithstanding the possibility of downsides, significant co-benefits have been identified with acting on climate change through a transition to low-carbon societies. Roundtable participants were asked to consider the importance of several of these co-benefits to their own jurisdictions. Their cumulative responses are indicated in the table below (Figure 10), listed in order of the perceived importance of the societal co-benefit.

Roundtable jurisdictions found that the three most crucial co-benefits of transitioning to a low-carbon society were employment growth, reduced risks to the adverse effects of climate change, and the opportunity to attract new industries. Also rated as highly important

Possible downsides to be managed in transition to low-carbon economy

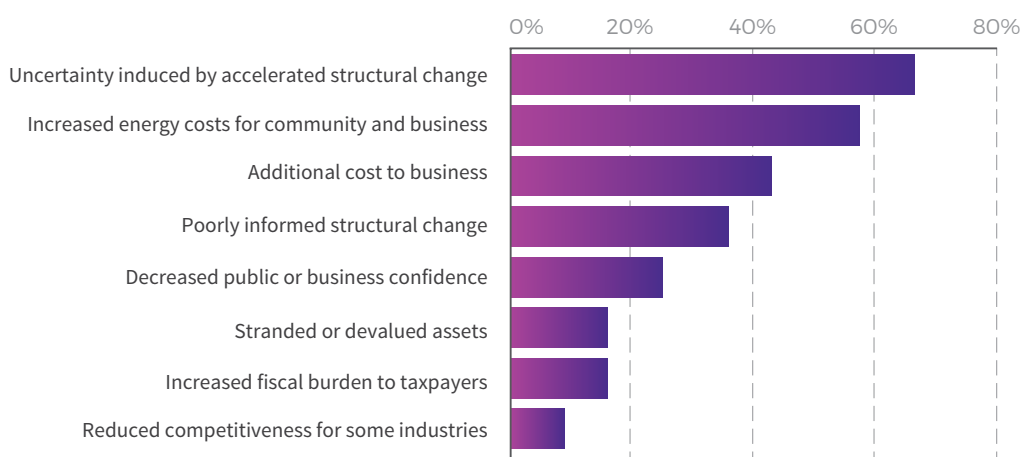


Figure 9: Possible downsides to be managed: % of Roundtable survey respondents electing

POSSIBLE CO-BENEFITS	CRUCIALLY IMPORTANT	VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT VERY IMPORTANT	NOT AT ALL IMPORTANT
Improved jobs outlook and employment growth	83%	17%	0%	0%	0%
Reduced risk to adverse effects of climate change	67%	25%	8%	0%	0%
Opportunity to attract new industries	67%	25%	8%	0%	0%
More sustainable local society and economy	42%	42%	17%	0%	0%
Opportunity to demonstrate local leadership	33%	58%	8%	0%	0%
Reduced business risk from uncertain response	25%	75%	0%	0%	0%
Fostering an innovative business culture	25%	75%	0%	0%	0%
Improved environmental and land management	17%	58%	25%	0%	0%
Improved citizen health	8%	58%	33%	0%	0%
Decreased reliance on external energy sources	0%	25%	50%	25%	0%

Figure 10: Co-benefits to climate change action: % Roundtable survey respondents electing

by all respondents were the co-benefits of a sustainable local society, the opportunity to demonstrate local leadership, reduced risks associated with business uncertainty, and fostering an innovative business culture. Benefits associated with a decreased reliance on external energy sources were considered to be only somewhat important.

## CHALLENGES

Roundtable jurisdictions were asked to consider up to three challenges and other considerations to the transition to a low carbon society in their region. Their responses are illustrated in Figure 11.

Half of survey participants nominated challenges of mainstreaming climate action across all sectors and the specific current economic and industrial profiles of their regions as primary challenges. Also ranked highly as key considerations were the perceived risk in executing any change in policy, difficulties of achieving economic scale, and regulatory and legislative hurdles. Regulatory or legislative decisions that are enacted by one level of government, but implemented by another can create governance issues that create barriers. None of the respondents considered lack of knowledge of likely local impacts as an issue.

Specifically, separate policy portfolios for the environment, energy and the economy can frustrate attempts to build coherent and stable policy that produces the best results overall. The Australian Commonwealth government has recently combined its energy and environment portfolios, which may be a first step in recognizing the nexus of these issues.

It may be that some of these challenges can be met in the near term through subnational efforts that bring together precisely those jurisdictions that are most interested in particular sectors or courses of climate action. In this way, the action can be more nimble, whilst still growing economies of scale.

## MANAGING THE CHALLENGES

Roundtable members are tackling possible risks and challenges associated with climate change action through a variety of mechanisms, one of the most common of which is the formulation of **strategic, staged, action plans**, grasping and **showcasing opportunities**, and **working with others** to increase influence and effectiveness.

**Adelaide** is preparing a Low Carbon Economy Plan, expecting its completion by 2018. The second climate change action plan of the **ACT** is credited with the Territory now being on track

to deliver its 40% GHG reduction target in 2020 through continued roll out of energy efficiency projects and large scale renewables. The **Hobart** City Council is currently developing a Community Energy Action program with fit-to-purpose methodology for local community (residential, retail/business and industrial) emissions and energy use. Ongoing measurement will enable programs that are the most effective and efficient in terms of use of resources and outcomes. City of **Perth** is developing its Community Climate Action Plan, which will involve extensive internal and external stakeholder engagement in order to collaboratively identify mutual benefits, and thereby create buy-in for progressive climate action.

Increasing levels of community engagement, as a means of influencing community opinion, is also a path that **South Australia** is taking, with an increased focus on the benefits and opportunities in transitioning to a low carbon economy. Policy change engagement, including longer lead times, will assist with the perceived risks of changes in policy.

**Victoria's** path includes reforming the Climate Change Act to include a long-term net zero emissions target and 5-yearly staged, interim targets to provide a clear path for planning and investment. The reforms will expand the range of government bodies required to consider climate change in their decisions.

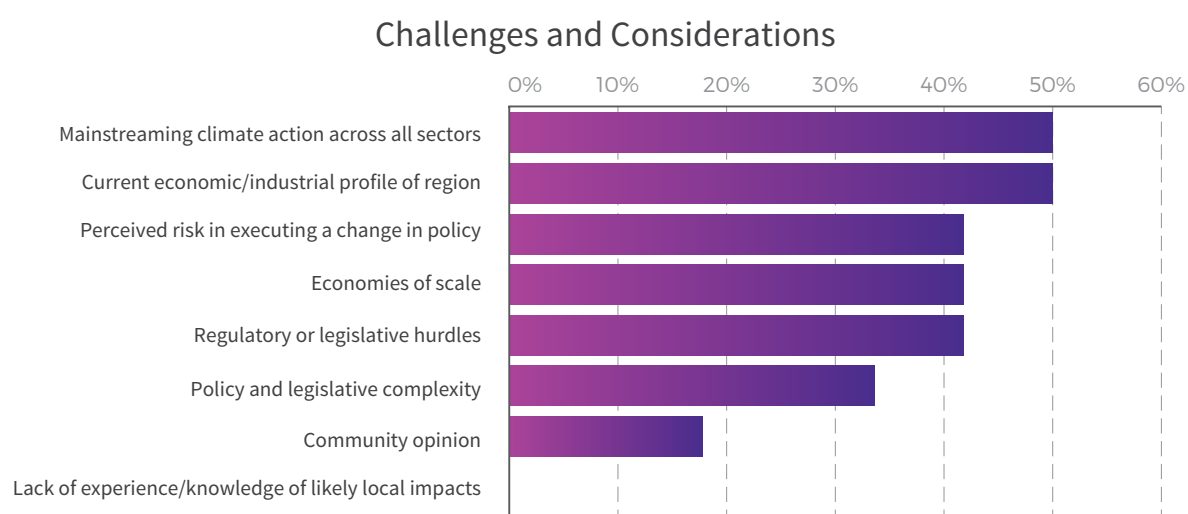


Figure 11: Considerations in low-carbon transition: % of Roundtable survey respondents electing

Victoria's TAKE2 climate change pledging program encourages and supports a shared responsibility for emissions reduction by Government, business and the community. The Victorian Government is also developing renewable energy and energy productivity strategies, which will help Victoria capture investment, jobs and industries for the low carbon future.

**Queensland** cites benefits from significant research and investment in the bio-energy sector and growing investment in carbon forestry projects as ways to mitigate risk. The state also sees opportunities in the large scale mining and manufacturing sectors, where Queensland can combine its manufacturing expertise, large resource base and renewable energy potential to produce low emissions products and resources. In particular, Queensland believes it has the potential to be a net exporter of renewable energy to other states.

Partly as a risk mitigation technique, the City of **Darwin** is focusing on adaptation to climate variability in the first instance, with a gradual shift to proven low emissions technologies.

Not all challenges are under direct local government control, including energy market rules. The City of **Sydney** is working with the Total Environment Centre and the Property Council of Australia, to progress a rule change proposal for local energy generation credits as one way to encourage useful change outside their direct control.

The City of **Melbourne** is developing and delivering projects/programs locally, in order to show the economic benefit and opportunity of action to other levels of government and private sector, and thus increase influence and advocacy.

The **Hobart** City Council coordinates, under the auspices of the Southern Tasmanian Councils Authority, a Regional Climate Change Initiative that provides a forum to share knowledge and information across the 12 southern councils, and allows for collaboration on projects and programs, and the possibility to attract funding and advocate on behalf of local government.

The forum meets quarterly and is attended by representatives from the Tasmanian Government and the Local Government Association of Tasmania.

Learning from others is also key; **Tasmania** and the City of **Perth** both plan to draw on the experience of others and to examine case studies.



# LEVERS OF ACTION IN GOVERNMENT

Subnational governments have many levers for action at their disposal for effecting positive change in their jurisdictions. Roundtable participants were asked in the pre-meeting survey to indicate which levers they were pulling, which have been most effective in reducing GHG emissions, which have the most significant economic, environmental and social co-benefits, and which are currently most difficult or problematic.

## TOOLS BEING USED BY ROUNDTABLE JURISDICTIONS

To understand the current state of play, Roundtable jurisdictions were asked to list all of the mechanisms that they currently use to reduce GHG emissions and thereby move to low-carbon societies. These include policies, programs, legislation and regulation in the primary sectors responsible for GHG emissions: energy, industry, agriculture/land use, transport, built environment and waste. Figure 12 below illustrates the relative frequency with which different tools are being employed by Roundtable jurisdictions.

All but one of the jurisdictions has either **aspirational or legislated emissions reduction targets**, and two-thirds have aspirational or legislated targets for the **take up of renewable energy**. All of the responding states and territories are encouraging renewable energy through policies, programs or incentives.

All but two of the jurisdictions completing the survey have policies, programs and or regulation in place to manage emissions from the **waste sector**.

In the survey, only Victoria reports currently employing the levers of government to directly manage industrial emissions through regulation, policy or programs, but four of the five reporting states and territories are tackling agricultural emissions through regulation, policy or incentives. Only one subnational jurisdiction reported the use of regulation in the transport sector but three-quarters of respondents are using policy and/or programs to tackle **transport emissions**.

All but two reporting jurisdictions are using regulation, policy or programs to reduce **emissions in the built sector**.

Two-thirds of those responding are monitoring local GHG emissions.

Whilst it can be especially challenging to track emissions in a small council that is part of a larger municipal area, the Cities of Sydney, Melbourne and Adelaide are transitioning to using the **Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)** (WRI 2014) in an attempt to track and report emissions in a manner that is consistent with IPCC guidelines. The GPC requires cities to report GHG emissions by scope and sector, and total these using two distinct but complementary approaches. One captures emissions from both production and consumption activities taking

## Mechanisms Currently used by Roundtable Members to Reduce Emissions

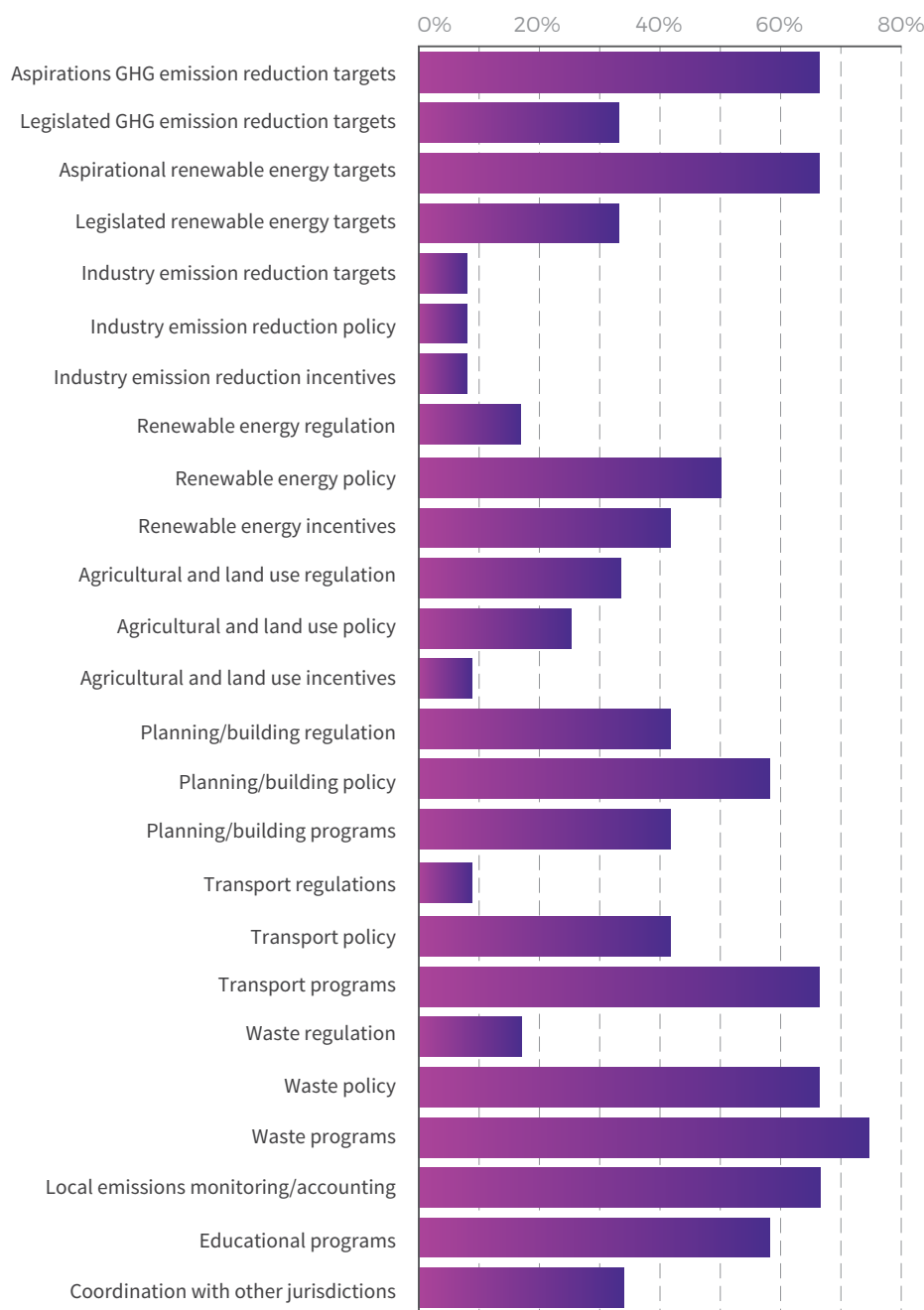


Figure 12: Current mechanisms to reduce GHG emissions: % of Roundtable survey respondents using

place within the city boundary, including some emissions released outside the city boundary. The other categorizes all emissions into “scopes,” depending on where they physically occur. The GPC is collaboration between C40, the World Resources Institute and ICLEI to develop a single global standard; it was officially launched in December 2014.

Over half of the jurisdictions responding to the snapshot survey employ **educational programs** targeted at schools or households.

Four subnational governments report cooperative efforts with other jurisdictions, a number that the Roundtable meeting itself seeks to increase.

## EFFECTIVE, CO-BENEFICIAL, DIFFICULT?

In the snapshot survey, jurisdictions were asked, based on their experience, which of the listed levers of government were most effective, which carried the most co-benefits, and which were the most difficult or problematic, e.g., in terms of cost, ineffectiveness, economic impact, politico-social license, or risk (Figure 13). Each respondent could choose up to five from the list.

The tools of government judged to be **most effective** for emissions reduction were:

- Aspirational targets for GHG emissions
- Renewable energy policy
- Renewable energy incentives
- Waste programs
- Education programs

Renewable energy policy programs and incentives, along with educational programs were ranked as having the **highest level of societal co-benefits**, with relatively little difficulty in implementation. Given this, it is not surprising that most jurisdictions completing the snapshot survey currently have a target for renewable energy uptake, are directly encouraging renewable energy with policy, regulation or incentives, and are employing education programs.

Interestingly, aspirational targets for GHG emission reductions were seen as more effective than legislative ones, perhaps because individual City Councils often do not have legislative authority.

Monitoring and accounting of emissions, and transport regulation are also seen to have high levels of co-benefit.

Emissions regulation of industry, building/ planning, and agriculture, was judged to be **problematic and/or difficult** by at least a third of the respondents. Transport regulation was seen by some to have co-benefits, but also problematic and not currently effective.

When asked to provide reasons underpinning why some mechanisms for change were felt to be difficult or problematic, respondents cited:

- Institutional hesitancy
- Perception that strong climate change action is not possible
- Perception that climate action will be at the expense of jobs and economic prosperity
- Resistance to industry regulation
- Complexity of interfacing renewables to current infrastructure and the national energy market
- Competing land uses in the agricultural/land sector
- Powerful, vested interests in some parts of the industrial sector
- Lack of recognition that built infrastructure, in particular, should be carbon neutral by 2050

Examination of the survey results for these questions reveals that several respondents considered coordination with other jurisdictions to carry high co-benefits, and little difficulty in implementation, but none rated it as currently effective. Increasing the effectiveness of subnational jurisdictional cooperation is, of course, a main aim of the Roundtable itself, and opportunities to do so are discussed in the next section.

## Tools of Government: Roundtable Characterisation

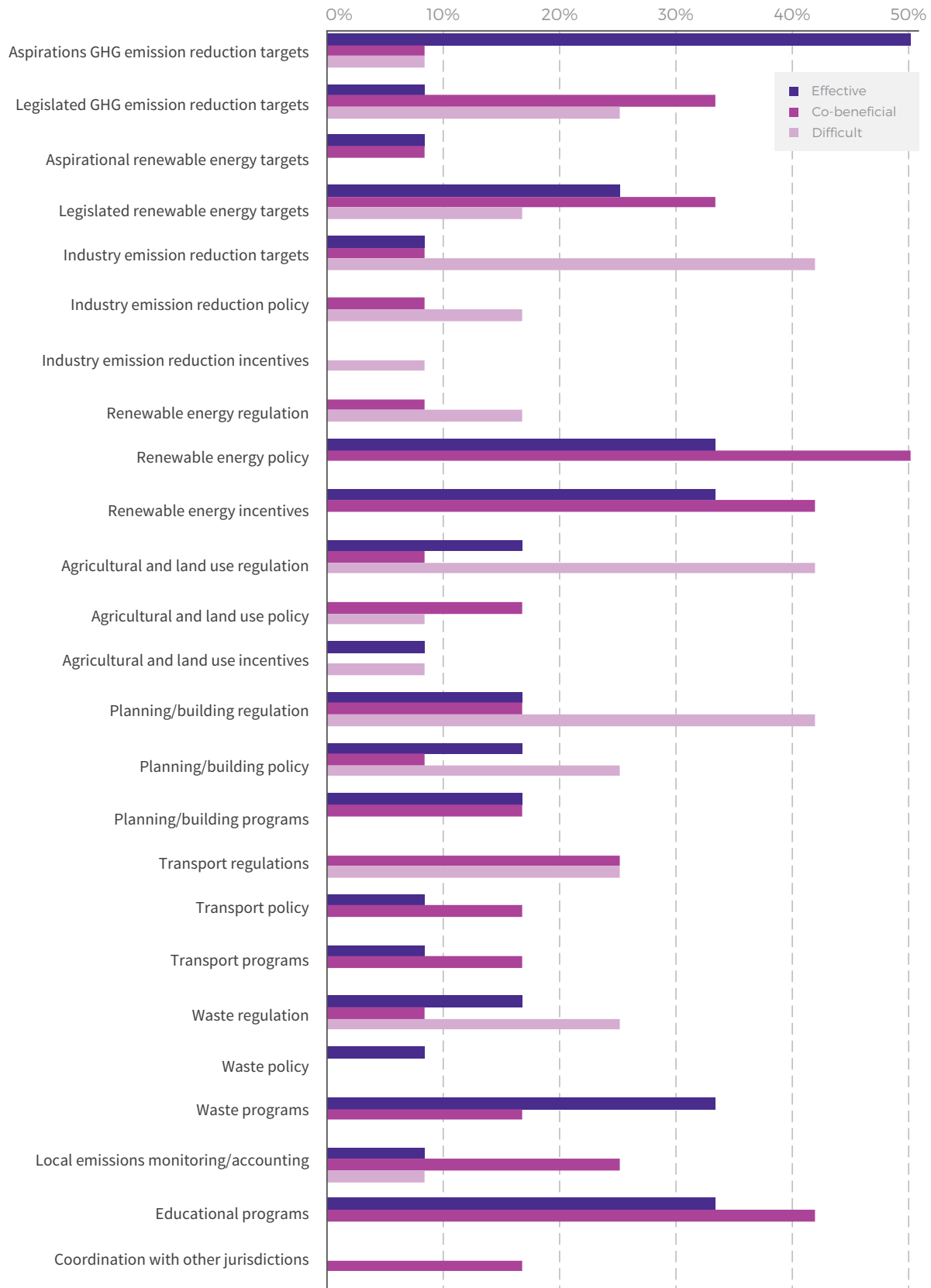


Figure 13: Rating Levers of Government as Effective, Co-beneficial, and/or Difficult: % of Roundtable survey respondents electing

# OPPORTUNITIES FOR COOPERATIVE ACTION

It is clear that most Australian states, territories and capital cities are acting individually to reduce their carbon footprints and to grasp opportunities in the low-carbon transition. In addition, several bodies and governance arrangements already exist to facilitate subnational collaboration in Australia on climate change and the low-carbon transition. Among others, these include the Council of Capital City Lord Mayors, the Council of Australian Governments (COAG) Energy Council, the Australian Building Code Board (ABCB, also a COAG body), the National Electricity Market (NEM). Benefit from the Climate Action Roundtable will accrue in areas that extend and complement these existing actions and structures, or improve their responsiveness and effectiveness.

## INTERNATIONAL AND AUSTRALIAN COOPERATION

Most roundtable survey respondents saw substantial or outstanding benefit in working with international organisations of subnational governments (such as ICLEI, The Climate Group, etc.) on climate action and the low-carbon economy. Working with other Australian subnational jurisdictions on these issues was considered even more beneficial, with over 90% considering it to have crucial/outstanding or substantial benefit (Figure 14). This bodes well for the success of the Roundtable.

More detail on the specific areas for joint action with Australian cohorts is given in the next section.

## ROUNDTABLE SYNERGIES

Roundtable members were asked in the pre-meeting snapshot survey what might be the greatest benefits of joint action on climate change and transitioning to low-carbon society, and which policy, program, legislative and regulatory mechanisms would most benefit from cooperation amongst Australian subnational governments.

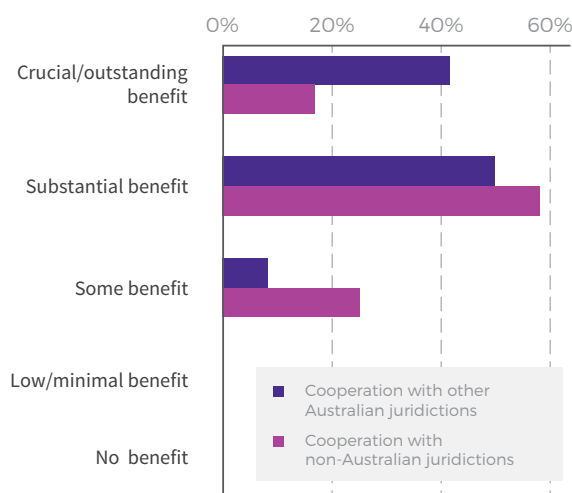


Figure 14: Extent of climate cooperation benefit: % of Roundtable survey respondents electing

## Possible benefits of Joint Roundtable Climate Action

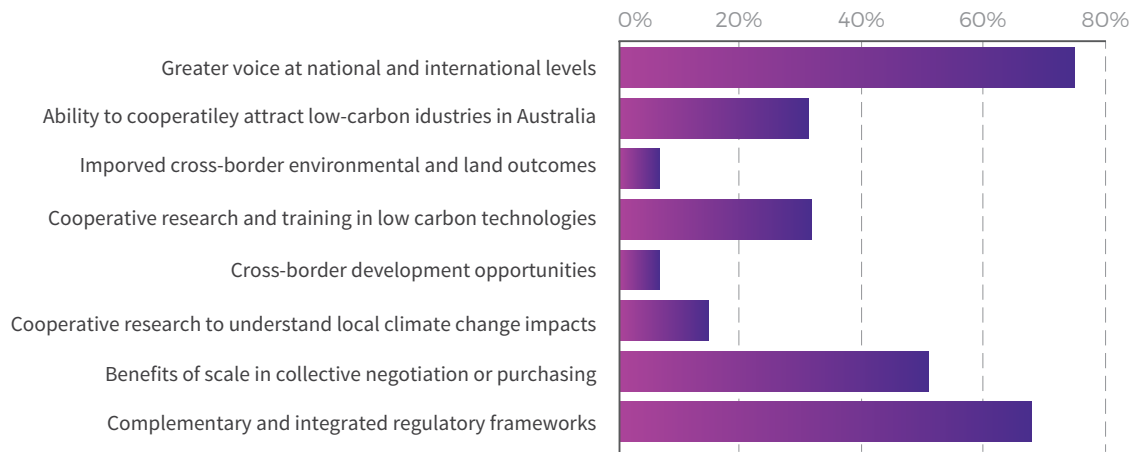


Figure 15: Specific benefits of joint Roundtable climate action: % of survey respondents electing

Asked to nominate up to three broad benefits (from a list of eight) of joint action, two areas emerged as clear front-runners: Developing a **greater voice** at national and international levels, and cooperating on **complementary and integrated regulatory frameworks**. These benefits were cited highly both by Capital Cities and States/Territories. Benefits of **greater economies of scale** in collective negotiation or purchasing was also seen as promising, as well as working cooperatively to attract low-carbon industries to Australia and engaging in cooperative research and training in low-carbon technologies. Figure 15 above taken from Roundtable survey responses illustrates these points.

Not surprisingly, the smallest jurisdictions, namely capital cities and the ACT, were particularly interested in the benefits of achieving economies of scale in negotiation and purchasing. The larger states and territories dominated those jurisdictions attracted to the benefits of cooperatively attracting low-carbon industry and participating in cooperative research and training in low carbon technologies.

In considering which mechanisms, or tools, of subnational government might most benefit

from cooperative work by Roundtable members, survey respondents chose up to five from the long list of levers considered in the previous section. Figure 16 summarises survey responses to this question.

Topping the list for most votes collected were **planning and building regulation and policy**, which was particularly important to population-dense jurisdictions, followed by **legislated renewable energy targets, transport policy, and educational programs**.

The total number of responses is dominated by the smaller jurisdictions: seven capital cities and the ACT. The **four largest jurisdictions** placed mechanisms that influence **industrial and agricultural emissions** very high on their lists for cooperative action.

It is noteworthy that mechanisms for change in planning/building, transport and industrial emissions were viewed as somewhat problematic in Section 8. Despite this, or perhaps because of it, respondents to the Roundtable snapshot survey feel that these areas hold high promise for cooperative work on the subnational level.

## Mechanisms for which cooperation may be valuable

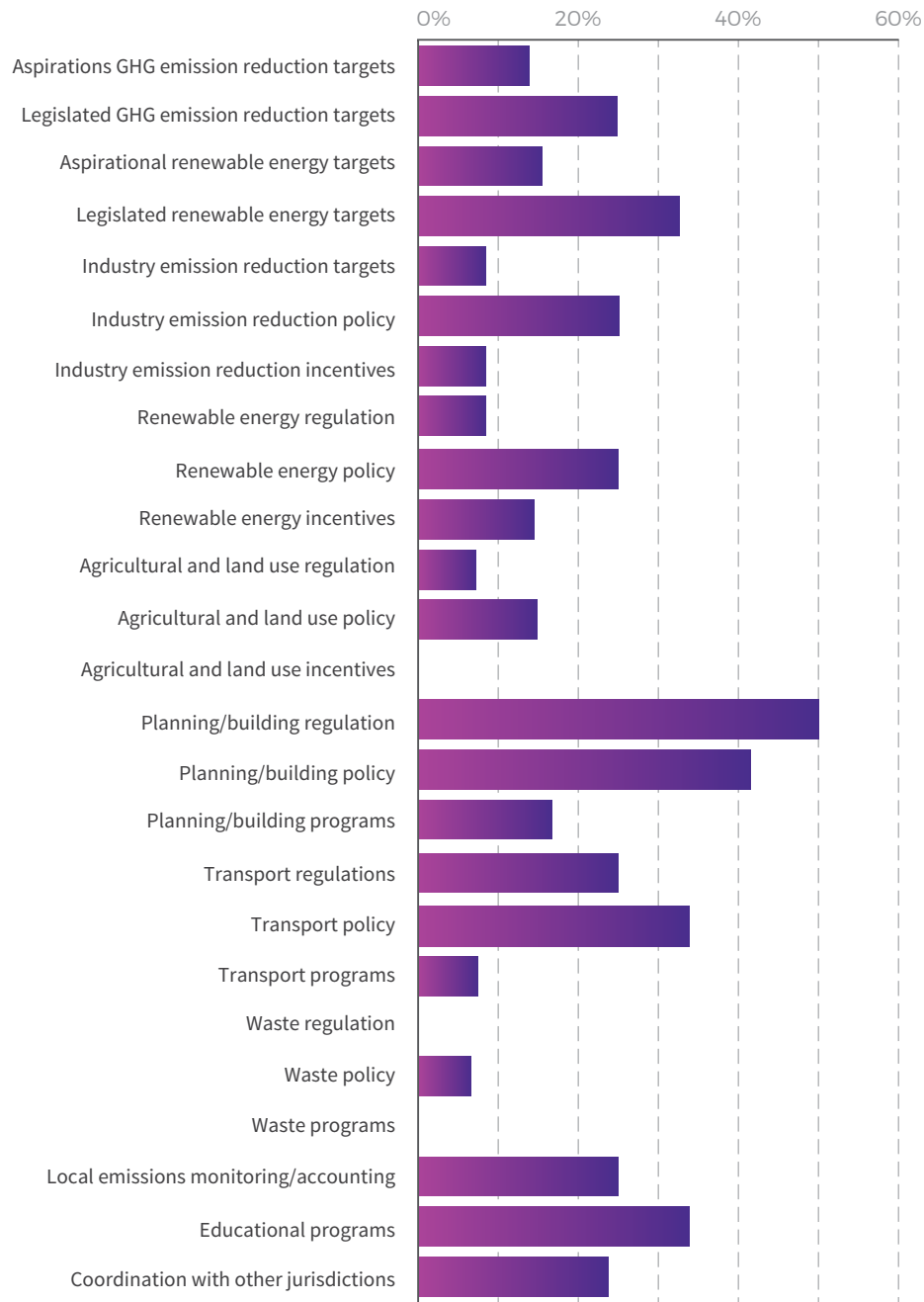


Figure 16: Specific tools of government rated as most beneficial for joint Roundtable action: % of survey respondents electing

This is also echoed by the high-ranking received by complementary and integrated regulatory frameworks as a benefit of subnational collaboration.

The Climate Action Roundtable has an opportunity to complement the several subnational bodies that already have the ability to influence climate change outcomes and the transition to low-carbon societies. These bodies include, among others, the Council of Capital City Lord Mayors who advocate on all matters related to cities, including climate change, COAG, the ABCB, which oversees the National Construction Code, and the NEM, which serves the ACT, New South Wales, Queensland, South Australia, Tasmania and Victoria.

In particular, the **Roundtable is a unique opportunity** to discuss mechanisms by which subnational cooperative climate action could occur that:

- Explicitly joins the strengths and interests of states, territories and cities,
- Harmonises emissions accounting and reporting between different levels of government,
- Allows subsets of subnational jurisdictions to partner in areas of most interest to them that both serve to increase the ambition of current nationally-agreed goals whilst also serving as pilot projects to inform later action by others, and
- From the outset has a particular focus on the Energy-Environment-Economy nexus.

Certainly the work of the COAG Energy Council, the NEM and the ABCB is crucial to many of the interests and opportunities for benefit

articulated by Roundtable survey respondents. In particular, it is notable that the Energy Council recognises the need for cooperative effort to better integrate energy and climate policy.

The Energy Council's recently released *National Energy Productivity Plan* (Commonwealth of Australia, 2015) sets part of the background that will inform joint Roundtable action, just as cooperative work within the Roundtable can be used as on-the-ground pilot solutions to climate change that take advantage of new opportunities in a low carbon world.

## IN SUM

In sum, clear trends have emerged in the aspirations, challenges and perception of benefit for joint action by the Roundtable on climate change and the transition to the low-carbon economy. These are set out in the Executive Summary of this Report. Working together, Australian subnational jurisdictions can extend on work done in the past by overcoming cooperatively some of difficulties faced in the past associated with governance arrangements, national policy uncertainty, regulatory barriers, portfolio silos, and resourcing challenges.

The ultimate goal is to work collectively to deliver low-carbon social and economic benefits to each subnational jurisdiction, whilst helping to deliver effective climate action for all.

For more information on the climate plans of Roundtable jurisdictions participating in the pre-meeting survey, see:

### THE **COAG ENERGY COUNCIL'S DECEMBER 2015 COMMUNIQUE** STATES IN PART:

*“Ministers agreed to a national, cooperative effort to better integrate energy and climate policy, with a clear focus on ensuring that consumers and industry have access to low-cost, reliable energy as Australia moves towards a lower-emissions economy.*

*Ministers also agreed that, fundamental to solving our energy challenges, is increasing the amount of supply, the number of suppliers, and removing obstacles towards this end.*

*The Energy Council also agreed to modernise regulatory frameworks and consumer protections so consumers can engage with increasingly dynamic and decentralised energy markets driven by the need to accommodate emerging technologies”.*

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#### **Australian Capital Territory**

[www.environment.act.gov.au/cc/what-government-is-doing/emissions-and-mitigation](http://www.environment.act.gov.au/cc/what-government-is-doing/emissions-and-mitigation)

#### **Brisbane**

[www.brisbane.qld.gov.au/about-council/governance-strategy/vision-strategy/brisbanes-plan-action](http://www.brisbane.qld.gov.au/about-council/governance-strategy/vision-strategy/brisbanes-plan-action)

#### **Darwin**

[www.darwin.nt.gov.au/climate-change/climate-change](http://www.darwin.nt.gov.au/climate-change/climate-change)

#### **Hobart**

[www.hobartcity.com.au/Environment/Climate\\_and\\_Energy](http://www.hobartcity.com.au/Environment/Climate_and_Energy)

#### **Melbourne**

[www.melbourne.vic.gov.au/about-council/vision-goals/eco-city/Pages/climate-change-adaption-strategy.aspx](http://www.melbourne.vic.gov.au/about-council/vision-goals/eco-city/Pages/climate-change-adaption-strategy.aspx)

#### **Perth**

[www.perth.wa.gov.au/city-perth-environment-strategypdf](http://www.perth.wa.gov.au/city-perth-environment-strategypdf)

#### **Queensland**

[www.qld.gov.au/environment/climate/climate-change/](http://www.qld.gov.au/environment/climate/climate-change/)

#### **South Australia**

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

#### **Sydney**

[www.cityofsydney.nsw.gov.au/vision/towards-2030/sustainability](http://www.cityofsydney.nsw.gov.au/vision/towards-2030/sustainability)

#### **Tasmania**

[www.dpac.tas.gov.au/divisions/climatechange](http://www.dpac.tas.gov.au/divisions/climatechange)

#### **Victoria**

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

# LIST OF ACRONYMS

<b>ABCB</b>	Australian Building Code Board
<b>ACT</b>	Australian Capital Territory
<b>C40</b>	C40 Cities Climate Leadership Group
<b>CEFC</b>	(Australian) Clean Energy Finance Corporation
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>CO<sub>2</sub>e</b>	Carbon dioxide equivalent
<b>COAG</b>	Council of Australian Governments
<b>COP21</b>	2015 United Nations Climate Change Conference, 21 <sup>st</sup> Conference of Parties
<b>DDPP</b>	Deep Decarbonization Pathways Project
<b>EV</b>	Electric vehicle
<b>GHG</b>	Greenhouse gas
<b>GBCA</b>	Green Building Council of Australia
<b>GDP</b>	Gross Domestic Product
<b>GPC</b>	Global Protocol for Community-Scale Greenhouse Gas Emission Inventories
<b>GSP</b>	Gross State Product
<b>GWh</b>	GigaWatt-hour
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>ICLEI</b>	International Council for Local Environmental Initiatives, also known as Local Governments for Sustainability
<b>LULUCF</b>	Land Use, Land Use Change, and Forestry
<b>MWh</b>	MegaWatt-hour
<b>NABERS</b>	National Australian Built Environment Rating System
<b>NGGI</b>	(Australian) National Greenhouse Gas Inventory
<b>PCC</b>	(US-Canada) Pacific Coast Collaborative
<b>PV</b>	Photo voltaic solar cells
<b>RGGI</b>	(US) Regional Greenhouse Gas Initiative
<b>TCI</b>	(US) Transportation and Climate Initiative
<b>Under2MOU</b>	Subnational Global Climate Leadership Memorandum of Understanding
<b>UNFCCC</b>	United Nations Framework Convention for Climate Change
<b>WCI</b>	Western Climate Initiative, Inc.
<b>ZEV</b>	Zero Emission Vehicle



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Compact of States and Regions  
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# APPENDIX A: US AND CANADIAN COOPERATIVES

More information is provided here about the intra-national collaborations mentioned in Section 3.3 for joint climate action and support of low-carbon economies in the USA and Canada.

## CLIMATE LEADERSHIP AGREEMENTS: PACIFIC NORTH AMERICA

The [Pacific Coast Collaborative \(PCC\)](#) is an alliance with broad goals: it is a formal mechanism for cooperative action, a forum for leadership and information sharing, and provides a common voice for issues facing Pacific North America. The US states of Alaska, British Columbia, California, Oregon and Washington are members of the PCC. British Columbia, California, Oregon and Washington are also signatories to the global Under2MOU.

In June 2016, these same PCC regional leaders met to sign the Pacific Coast Climate Leadership Action Plan (PCC 2016a) an update of their 2013 climate and energy plan. The new plan outlines increasingly bold goals for decisive action in light of the COP21 global climate agreement. It places stronger emphasis issues such as:

- ocean acidification;
- the integration of clean energy into the power grid;
- support for efforts by the insurance industry and regulatory system to highlight the economic costs of climate change;
- reduction of the so-called “super pollutants” (also known as short-lived climate pollutants) including black carbon, methane and fluorinated gases;

- fostering climate resilient communities with a focus on disadvantaged residents who bear the brunt of climate change impacts.

Perhaps most notable was the **regional-city pact** signed in June 2016 by the U.S. governors of California, Oregon and Washington, and the Environment Minister of British Columbia, Canada together with mayors of six major US West Coast cities. Called the *Pacific North America Climate Leadership Agreement*, (PCC 2016b), the compact, signed on behalf of 53 million residents of the Pacific North American region, unified the provincial and state leaders with the mayors of the cities of Los Angeles (CA), Oakland (CA), Portland (OR), San Francisco (CA), Seattle (WA), and Vancouver (BA), to work together on the following:

- *Low carbon buildings*, specifically by collaborating on the design and implementation of large building energy benchmarking and disclosure, with the aim of at least 75% of eligible large buildings on the Pacific Coast reporting energy data through harmonized programs.
- *Low carbon transportation*, specifically by encouraging consumer adoption of Zero Emission Vehicles (ZEVs) through incentives and by urging manufacturers and retailers to increase the volume and variety of ZEVs in the region. Also pledged is the creation of a comprehensive Pacific Coast charging network along major highway systems from Southern California to British Columbia,

accelerated deployment of residential, workplace, and public charging infrastructure in major population centers, and achieving a procurement target of 10% ZEVs for government fleets.

- *Low carbon energy systems*, specifically by accelerating deployment of distributed and community-scale renewable energy and associated infrastructure and integration into the grid. Also pledged is lowering the carbon intensity of heating fuels in residential and commercial buildings.
- *Low carbon waste*, specifically by reducing carbon emissions from the food waste stream and returning carbon to the soil through composting through organic waste prevention and recovery initiatives.

Progress against these goals will be assessed and the agreement itself re-evaluated in three years. The pact carries no legal force.

## TRANSPORT INITIATIVES: TCI

In 2010, the [Transportation and Climate Initiative \(TCI\)](#) was founded as a regional US alliance of 11 states and the District of Columbia (Washington, DC) with the goal to develop the clean energy economy while reducing oil dependence and GHG emissions from the transportation sector. The 11 participating states are: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. The TCI is directed by the leaders transportation, energy, and environment agencies of the member jurisdictions. Each agency is free to determine whether and how they will participate in individual projects and working groups. The initiative is facilitated by the [Georgetown Climate Center](#) and its funders, and supported by a grant from the US Department of Energy.

Recognising that in their jurisdictions about one-third of all GHG emissions come from transport (Australia-wide the fraction is about half that), the participating TCI governments have started taking action in four core areas: clean vehicles and fuels, sustainable communities, increased freight efficiency, and innovative information

technologies. The commissioned a recently released report (Georgetown Climate Center, 2015) that analyses the potential for greenhouse gas (GHG) reductions from the transportation sector and the resulting benefits, costs, and macroeconomic impacts for their region. The report finds that clean transportation policies could cut GHG emissions between 29 to 40% in the TCI region by 2030. A comprehensive implementation of state policies could result in net cost savings of up to \$72.5 billion over 15 years for businesses and consumers, along with tens of thousands of new jobs and improvements in public health.

Two consequences of the TCI collaboration to date have been the launch of the [Northeast Electric Vehicle Network](#) and a research study of freight flows in the region.

The Northeast Electric Vehicle Network will enable travellers to drive their plug-in cars and trucks anywhere along routes from northern New England in the USA to Washington D.C. Public electric vehicle (EV) charging stations in the region have grown by 190% in the past three years. More than 1,700 public stations are now available. Simultaneously, the number of EVs in the region has increased 30-fold.

The TCI freight study looks at all truck, rail, air, and ship flows through the TCI region and indicated that 80% of all freight moved in TCI states is transported by heavy trucks, which often produce more GHG emissions than other modes of transportation. A follow-up study has been proposed that to explore the energy use and emissions associated with regional freight movement and identify freight routes by vehicle miles travelled and time-to-market metrics in order to determine potential transportation improvements.

Five TCI states (Connecticut, Delaware, New York, Rhode Island and Vermont) and the District of Columbia announced in November 2015 that they would also work together to develop regional, market-based policy to achieve significant reductions in GHG emissions and other pollution from the transportation sector.

Such policies may include an emissions budget program, carbon fee, or mileage-based user fee, which could increase the range of emission reductions to 32% to 40% in 2030 whilst

## THE *TCI* DECLARATION OF INTENT STATES IN PART:

“At a time when countries around the world are engaged in a race to build the clean energy economy and reduce greenhouse gas emissions, U.S. states in the Northeast and Mid-Atlantic regions are once again poised to lead the way.

The Transportation and Climate Initiative provides our states with the opportunity to expand safe and reliable transportation options, attract federal investment, lower transportation costs, improve overall air quality and public health, and mitigate the transportation sector’s impact on climate change. Additionally, the TCI provides our states with the opportunity to further our collaboration on the research and development of advanced transportation technologies.

We further believe that this collaboration will aid our current efforts to:

- Reduce traffic congestion;
- Encourage job growth and accommodate the flow of goods and services;
- Establish state and local land use strategies that increase commercial and residential housing density and encourage transit-friendly design;
- Improve the performance of existing highway, transit and other transportation modes while enhancing neighborhoods and urban centers; and
- Promote mixed-use development that supports viable alternatives to driving.

We understand that the future of transportation and job growth in our states requires forward thinking, the early adoption and deployment of clean energy technologies and a regional approach to clean transportation. We also understand that talking about the future is not enough. We must act.”

generating proceeds to fund transportation investments. Over 15 years, it has been estimated that businesses would save \$28.7 billion to \$54.5 billion and consumers would save \$3.6 billion to \$18 billion from a suite of clean transportation initiatives funded in this way, and that these cost savings from reduced fuel consumption, congestion, and consumer incentives would more than offset increased vehicle costs and fees. Such changes would increase gross regional product, personal disposable income and create new jobs, the TCI report said (Georgetown Climate Center 2015).

## MANDATORY CAP AND TRADE COMMON MARKET: RGGI

The [Regional Greenhouse Gas Initiative \(RGGI\)](#) is the first mandatory market-based program in the United States to reduce GHG emissions. In 2005, governors of seven north-eastern states signed the agreement to cap the carbon dioxide levels of their power plants at 2009 levels. Nine states now take part in RGGI: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Together these states account for more than 40 million people, about 13% of the total US population. Collectively, the RGGI states have 6 Democratic governors and 3 Republican governors.

RGGI market members say that the program is spurring innovation in the clean energy economy and creating green jobs in their states. They report that in the period 2005 to 2013, their region has experienced a reduction of over 40% in power sector CO<sub>2</sub> emissions since 2005, while the regional economy has grown 8% adjusted for inflation (see Figure 17).

The RGGI CO<sub>2</sub> Budget Trading Program comprises:

- A multi-state CO<sub>2</sub> emissions budget, or “cap.” This cap is periodically reviewed, and is currently declining at the rate of 2.5% per year.

- Requirements that “regulated sources,” namely fossil fuel-fired electric power generators with a capacity of 25 megawatts or more, to hold allowances equal to their CO<sub>2</sub> emissions over a three-year control period. There are about 163 such facilities in the market region.
- Allocating CO<sub>2</sub> allowances through quarterly, regional CO<sub>2</sub> allowance auctions
- Investing the proceeds from the auctions in consumer benefit programs to improve energy efficiency and accelerate the deployment of renewable energy.
- Allowing qualifying offsets (i.e., GHG emissions reduction or carbon sequestration projects outside the electricity sector) to help power plants meet up to 3.3% of their compliance obligation for each three-year control period. Regulatory requirements ensure that offsets are real, additional, verifiable, enforceable, permanent and located within one of the RGGI States.
- An emissions and allowance tracking system to record and track RGGI market and program data, including CO<sub>2</sub> emissions from regulated power plants and allowance transactions among market participants. These data are public.

Originally RGGI had 10 signatories, but under Governor Chris Christie (R), New Jersey withdrew its membership in 2011. He cited the increased

reliance on natural gas over coal in its energy mix, rather than RGGI, as the reason New Jersey was reducing its CO<sub>2</sub> emissions (New York Times 2011). In early years of the program, power suppliers were able to meet their caps easily, and RGGI carbon allowances traded at bottom-level prices because power plants were able to take advantage of cheap prices for natural gas, which is less polluting than coal.

Following a comprehensive program review in 2012, the RGGI states implemented a new, lower, RGGI cap of 91 million short tons (1 short ton = 2000 pounds = 0.8929 metric tonnes) for 2014. The RGGI CO<sub>2</sub> cap then declines 2.5 per cent each year from 2015 to 2020. Another program review will be held this year, in 2016.

As of March 2016, RGGI auction proceeds have raised a total of \$2.4 billion (USD). States reinvest these monies in consumer benefit initiatives, including energy efficiency, renewable energy, direct bill assistance, and GHG abatement programs.

An independent market monitor tracks the performance and efficiency of the RGGI CO<sub>2</sub> allowance auctions and the secondary CO<sub>2</sub> allowance market, issuing public reports quarterly and after each RGGI auction. Shown in Figure 18 are the RGGI allowance prices in USD/short ton of CO<sub>2</sub> over the 2014 and 2015 calendar years (RGGI 2016). For comparison, the average price was 1.89 USD/short ton in 2011,



Figure 17: Trends in CO2 Emissions and GDP for RGGI participating states between 2005 and 2013

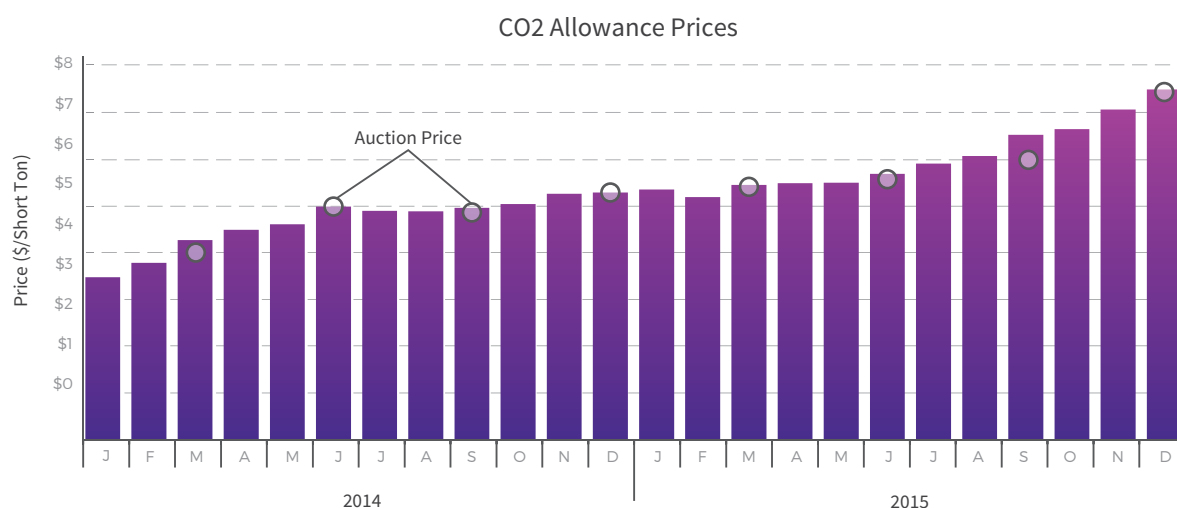


Figure 18: RGGI allowance prices in USD/short ton of CO<sub>2</sub> over 2014-2015

and is therefore now trading at 3 to 4 times that amount. Price variability was about 20% in the last fiscal year.

RGGI will hold its 33<sup>rd</sup> CO<sub>2</sub> allowance auction in September 2016.

## EMISSIONS TRADING SERVICE CORPORATION: WCI

The [Western Climate Initiative](#) (WCI) is a non-profit corporation formed to provide administrative and technical services to support the implementation of GHG emissions trading programs implemented individually by member jurisdictions, subsequently harmonised with one another. Current WCI members are California in the United States, and the provinces of Québec, British Columbia, Manitoba, and Ontario in Canada. Members supply funds to the corporation, which contracts for services required by the consortium. The WCI Board of Directors includes officials from California, British Columbia, Ontario, and Québec.

Early partners included the US states of Arizona, Montana, New Mexico, Oregon, Utah and Washington, but each of these formally left the group in late 2011, either because they planned to delay or not implement cap and trade programs in their jurisdictions. A number of US states and Mexican states have been official WCI observers over the past years.

As of 30 June 2016, California, Ontario and Québec had pledged funds to support the company through 2017.

On 1 January 2014, the California Cap and Trade Program and the Québec Cap and Trade System officially linked, which enabled the mutual acceptance of compliance instruments issued by each jurisdiction, and allowed the jurisdictions to hold joint auctions of GHG allowances. Ontario passed cap and trade legislation in May 2016, and plans to join the California-Québec market in 2018.

Beginning in 2013, the California cap decreases annually by 3%. The cap is economy-wide on major sources of GHG emissions (emitting 25,000 metric tonnes CO<sub>2</sub>e, or more), such as refineries, power plants, industrial facilities, and transportation fuels. It is estimated that these account for about 85% of California's emissions (see C2ES link). Proceeds from allowance auctions are reinvested in California for projects that further reduce GHG emissions. Since inception, over 4 billion USD has been deposited into the California Greenhouse Gas Reduction Fund from auction proceeds (CEPA/ARB 2016).

At the joint California-Ontario auction of May 2016, the auction settlement price was 12.72 USD per metric tonne, corresponding to 11.36 USD per short ton. On 16 August 2016, the 8<sup>th</sup> joint WCI auction for GHG emission allowances was held.



