

CARBON NEUTRAL ADELAIDE

Action Plan 2016–2021



In 2015 the State Government and Adelaide City Council committed to a joint aspiration for Adelaide to be the world's first carbon neutral city. We signed a sector agreement to formalise that collaboration, and released a shared vision document that outlined our direction and priorities for pursuing our goal.

In this Carbon Neutral Adelaide Action Plan 2016–2021 we outline specifically how we plan to make Adelaide the world's first carbon neutral city, by building community partnerships and focusing on five pathways to carbon neutrality.

Through Carbon Neutral Adelaide partners, we will empower our community to build upon its internationally significant achievements between 2007 and 2015 which resulted in a decoupling of economic growth and operational carbon emissions.

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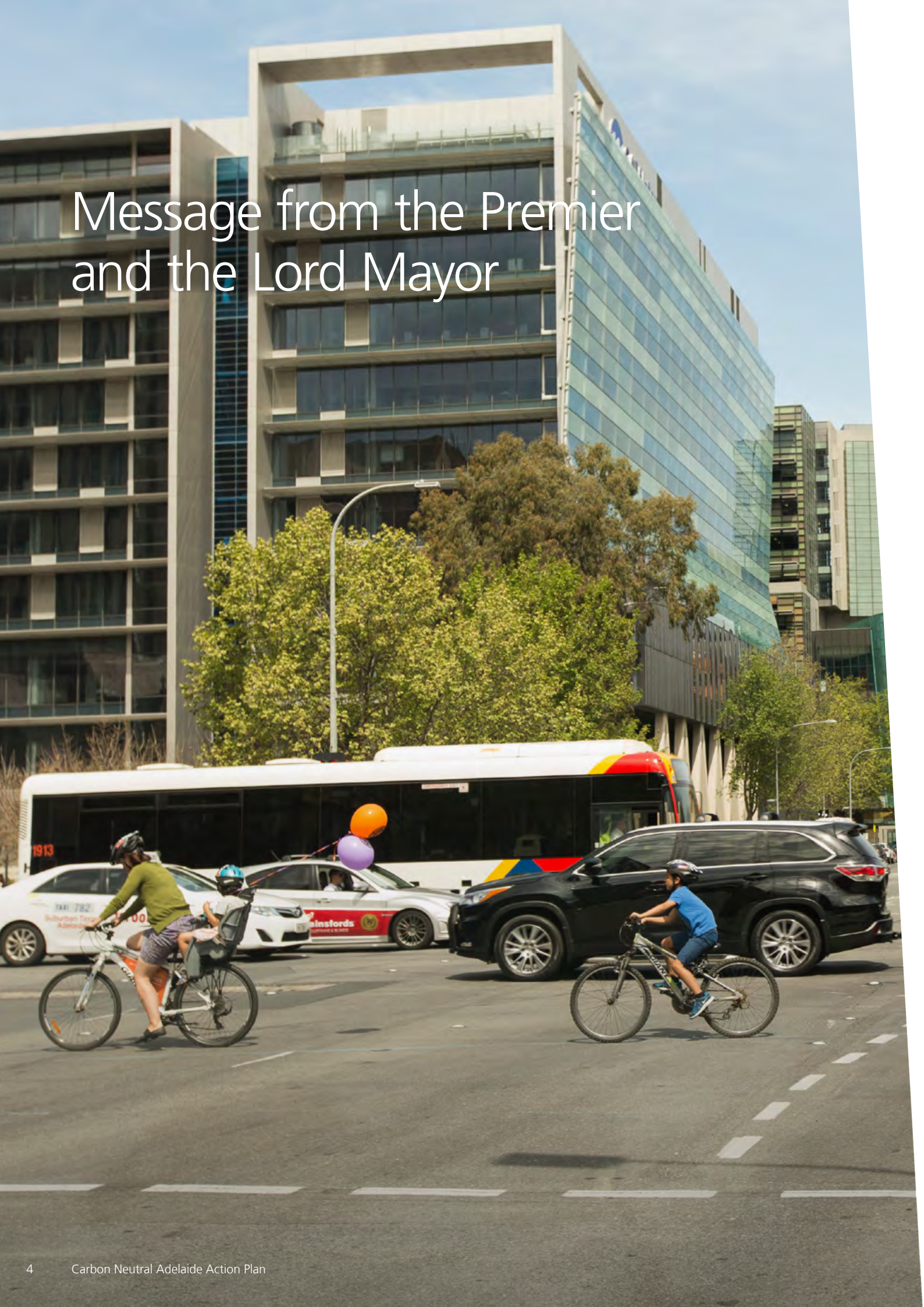
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Message from the Premier and the Lord Mayor



Adelaide has long been a leader on climate change action, and this Carbon Neutral Action Plan 2016–2021 is a comprehensive plan to help the city redouble its efforts and further enhance its status.

In 2015, we announced a bold, shared vision: to make our capital the world's first carbon neutral city.

There have been many developments by way of global action since that time, but the imperative for genuine, practical and long-term measures to reduce emissions is today no less acute.

When we were both in Paris for COP21 – the United Nations Conference on Climate Change – we were pleased and encouraged by the level of international interest in the achievements of Adelaide and South Australia.

Observers were impressed, for example, with our rapid moves to decarbonise the electricity network, in our ability to simultaneously cut carbon emissions and expand the economy, and with the formal alliance established by our two jurisdictions.

Nevertheless, we are determined not merely to maintain but to build on our successes and achievements.

Under the aegis of this Plan, we will seek to reduce emissions by concentrating on: buildings; transport; renewable energy; and water and waste.

It is important to emphasise, however, that this is not a task for the State Government and Adelaide City Council alone – it is one for the entire Adelaide community.

This Plan will ensure that we continue to be leaders in tackling climate change and that – as “early movers” – we capitalise on the enormous investment, employment and other opportunities arising in this dynamic field of public policy.

Adelaide's goal to become a carbon neutral city is an exciting part of our state's economic transformation, and we look forward to working constructively with you in this great and vital endeavour.



Jay Weatherill

Jay Weatherill
Premier of
South Australia



Martin Haese

Martin Haese
Lord Mayor,
City of Adelaide

Carbon Neutral Adelaide

NORTH ADLAIDE
INSTITUTE
Public Library
Community Centre



The South Australian State Government and Adelaide City Council have a shared aspiration for Adelaide to be the world's first carbon neutral city.

Adelaide will be a showcase for the uptake of renewable and clean technologies and for embracing the economic opportunities of responding to climate change. Together with the community we will build on Adelaide's reputation as a clean, green and liveable city.

The world is rapidly moving away from its reliance on fossil fuels to drive our economy and prosperity. At the United Nations Climate Change Conference (COP21) in December 2015, countries agreed as part of the Paris Agreement to a goal of limiting global temperature increase to well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees. This will require a massive transformation of global energy systems and infrastructure to be able to transition to a low carbon economy. This global transformation has commenced, and the opportunities for early movers are vast.

South Australia is well advanced in the transition to this new economy and is well placed to play a global leadership role. Our progressive regulatory and policy settings, and a proven capacity for innovation, have driven significant growth in the renewable energy and clean technology sectors over the last decade. Our record of decarbonising our electricity supply (43% of our electricity now comes from wind and solar) whilst achieving economic growth is a story of global interest.

Last year the State Government released South Australia's Climate Change Strategy 2015–2050. It provides a framework for action to maximise the State's opportunities for renewal and transformation and it sets a target for the state to achieve net zero emissions by 2050. One of the six pillars underpinning this target is Adelaide becoming the world's first carbon neutral city.

Adelaide City Council recently confirmed its commitment to action on climate change in the City of Adelaide 2016-2020 Strategic Plan, which has the pursuit of carbon neutrality as a cornerstone of building on Adelaide's strengths as a smart, green, liveable and creative city.

Positioning Adelaide to achieve carbon neutrality will strengthen South Australia's already prominent national and international leadership on climate change, and provide a strong foundation for the city's and the state's economic, environmental and social transformation. Capitalising on our global reputation will help to attract and secure national and overseas investment in local clean technology businesses and encourage international and interstate visitors to experience our state and city.

Contributing to state economic priorities

Achieving net zero emissions for the City of Adelaide will make a significant contribution to four of the State Government's economic priorities:

- **Unlock** the full potential of the state's resources, energy and renewable assets
- **Transform** the economy through fostering an environment of innovation
- **Ensure** that small businesses have access to capital and global markets
- **Promote** our international connections and engagement.



The City of Adelaide is not alone in its ambition to be a carbon neutral city—other cities have similarly bold targets. We will strive to be the first yet also work collaboratively with other cities and regions, learning from others to fast-track our efforts, and sharing our experiences to contribute to the global effort to reduce emissions.

Transformational approaches will be needed that go beyond conventional thinking. This will require decisive and ambitious action that will substantially enhance the way we live, work and socialise in the city. These changes will range from actions that are low cost and quick to show results, to long-term transformational initiatives that will require significant investment in energy, transport, waste and building infrastructure. While such measures are likely to have long lead-in times beyond the life of this action plan, they will ultimately deliver genuine and credible change that will benefit all South Australians.

This Carbon Neutral Adelaide Action Plan outlines a way forward for mobilising efforts to achieve carbon neutrality for the City of Adelaide. Based on the shared vision and framework for action released in November 2015, it sets out a five-year action plan that aims for rapid emissions reduction in the city.

The State Government and council cannot achieve these ambitious goals alone: harnessing the energy, commitment and creativity of our entire community will be required. This action plan identifies a partnership framework as the foundation to Carbon Neutral Adelaide, to involve the community in decision-making, priority setting and implementation of this challenging endeavour.

In June and July 2016 we engaged with our community to ask how the city could become the first carbon neutral city and how we could be a climate change action world leader. We found that there was a high level of support for this aspiration and there were many ideas, large and small, put forward for consideration. The findings from the consultation have been incorporated into this action plan.





Adelaide the capital city of South Australia



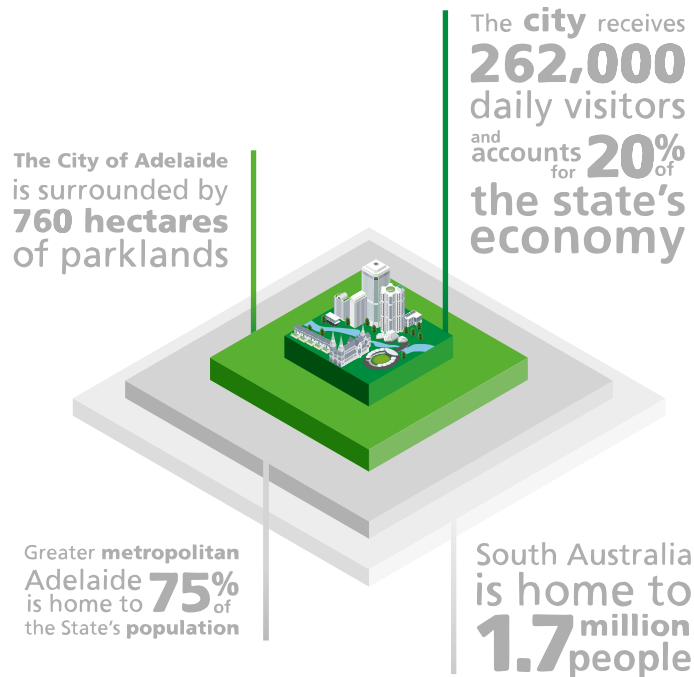
What does carbon neutrality for the City of Adelaide mean?

Carbon neutrality for the City of Adelaide means that the net greenhouse gas emissions associated with operational activities that occur within the Adelaide City Council local government area are equal to zero. The local government area includes the Adelaide Park Lands, the CBD and North Adelaide.

Carbon neutrality is achieved through a combination of measuring and reducing greenhouse gas emissions and then purchasing carbon offsets.

Adelaide is the capital city of South Australia. Greater metropolitan Adelaide is home to 75% of the State's population of 1.7 million people. The City of Adelaide is surrounded by 760 hectares of parklands. The city accounts for 20% of the state's economy.

With a rapidly growing population, the City receives 262,000 daily visitors and is the hub of greater metropolitan Adelaide's public transport system.



City of Adelaide's emissions



In 2014/15, the total operational greenhouse gas emissions of the City were 951,923 tonnes CO₂-e. Electricity, gas and transport fuel use were the primary sources of carbon emissions, with electricity and gas contributing 60%, transport fuel use 35% and waste disposed to landfill generated 5% of emissions.

Since 2007, operational emissions from the city have reduced by 19%. This has mostly occurred due to reductions in carbon emissions from stationary energy. This is an outstanding result, especially as significant residential and commercial growth has occurred over this timeframe. The increase in commercial and high density residential floor space has been offset with improved energy efficiency and renewable energy use.

The rate of reduction of emissions has slowed in recent years, with 2014/15 emissions slightly higher than 2012/13 (939,532 tonnes CO₂-e, an increase of 1%). This is due to the continued growth in residential apartments, and a slowdown in large-scale wind farm construction, because of the recent uncertainty surrounding national policy settings, in particular Australia's Renewable Energy Target.

This is a timely reminder of the importance of continued innovation to achieve growth while reducing emissions, and of the critical need for policy certainty to underpin investment in the infrastructure that will drive the low carbon economy.

We will continue to publicly disclose independently-verified emissions inventories for the city to maintain a high level of accountability, to openly share our experiences with other jurisdictions, and to involve the community in our planning and decision-making.

See Appendix 1 'How do we measure our emissions?' for more information on emissions measurement.

City of Adelaide greenhouse gas emissions profile 2014/2015

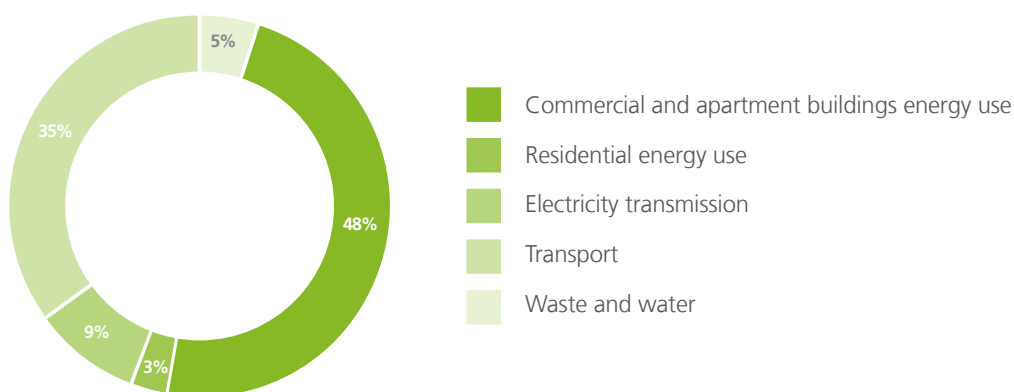
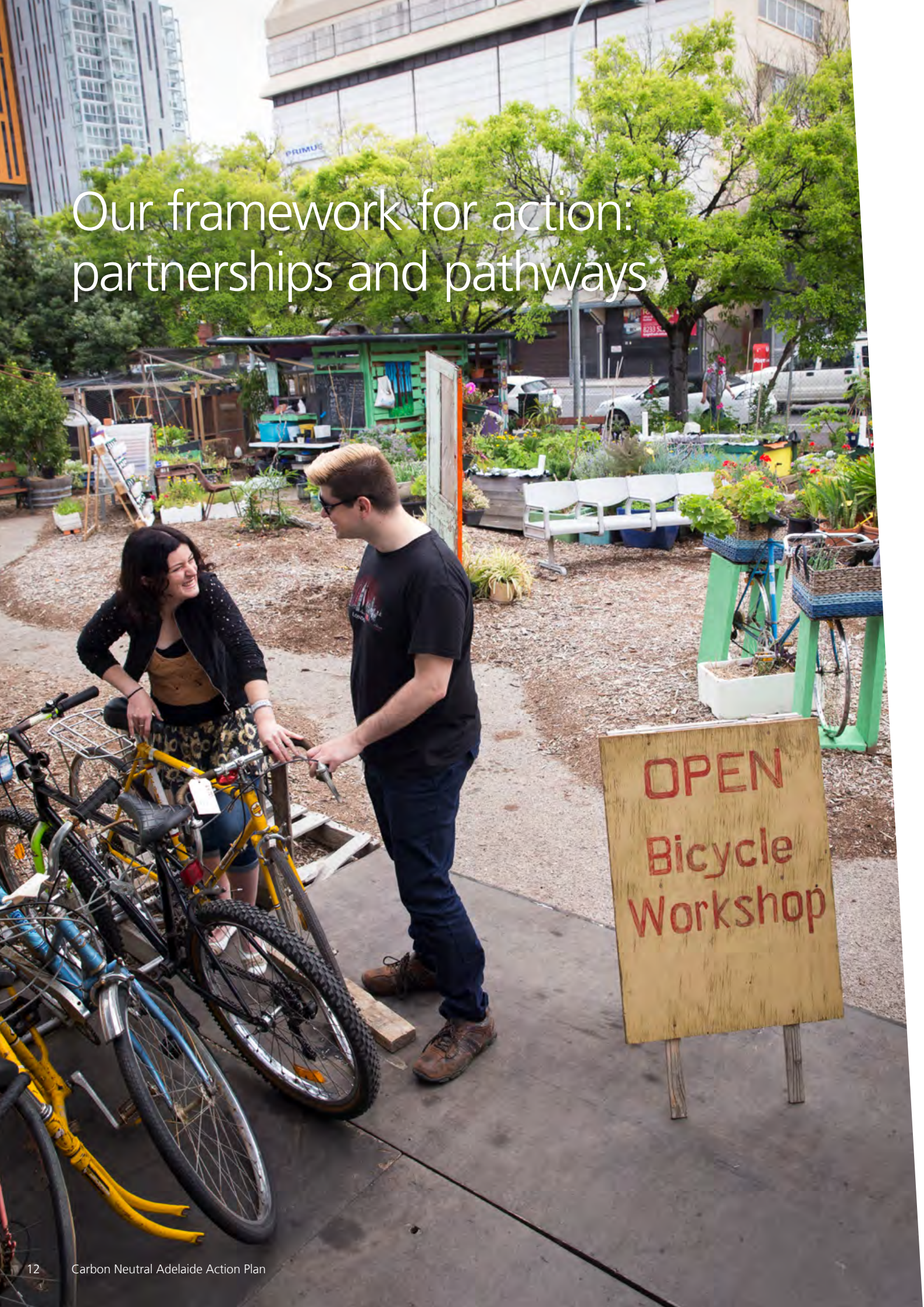


Figure 1: City of Adelaide greenhouse gas emissions profile 2014/15

Our framework for action: partnerships and pathways



In 2015, consultants were commissioned to prepare the Carbon Neutral Adelaide Foundation Report to analyse emissions reduction pathways and the potential for the City of Adelaide, and priorities were recommended to achieve carbon neutrality.

The Carbon Neutral Adelaide Foundation Report found that with considerable community and government action it is possible to reduce the City's emissions by 50% from 2007 levels by 2020, and by approximately 65% by 2025. Scenario modelling confirmed that the City could reduce operational emissions from 1,175,000 tonnes CO₂-e in 2007 to 515,693 tonnes by 2020, and to 421,174 tonnes by 2025 (Figure 2). To achieve carbon neutrality, the remaining emissions will have to be offset through accredited carbon offsets.

Over the next five years the State Government and Council will work with a wide range of partners to achieve rapid emissions reduction. We will vigorously pursue deep cuts through our emissions reduction pathways. This will be underpinned by a Carbon Neutral Adelaide Partnerships initiative to harness community action and coordinate our collective efforts to realise our goal.

Projected emissions profile by sector in 2025

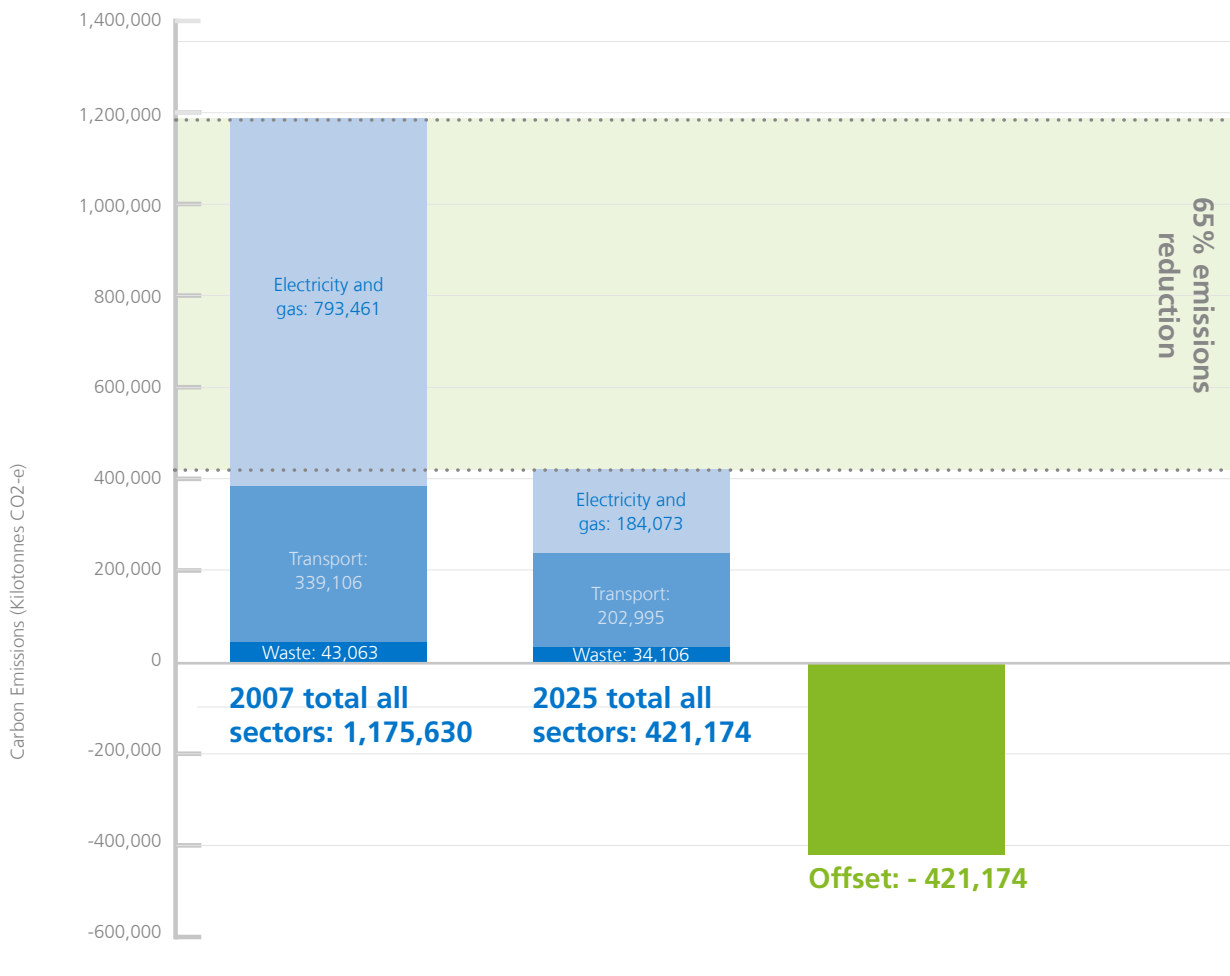
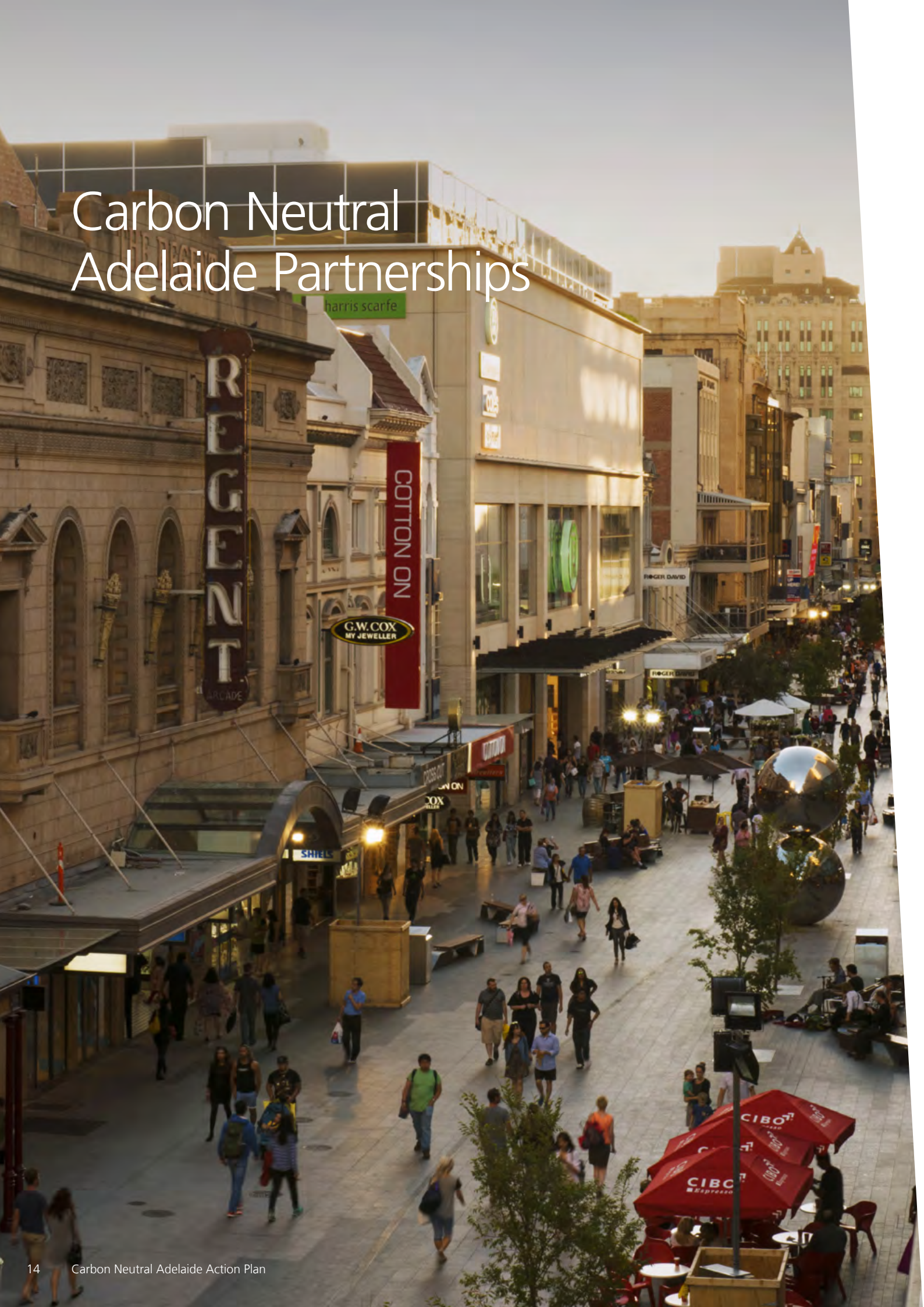


Figure 2: Projected emissions profile by sector in 2025 (*all figures are in tonnes CO₂-e)

Carbon Neutral Adelaide Partnerships



Current situation

The State Government and Council recognise that meeting our goal to be the world's first carbon neutral city will only happen with the support of the whole community.

Community engagement has confirmed that there is strong support and civic pride within the South Australian community for Adelaide pursuing the goal of being 'first'. We have a dynamic, committed community, with business, community groups and individuals already achieving sustainability results.

Involving the whole community in decision-making and implementation of activities will build community ownership and commitment to create a more sustainable, creative and liveable city. Partnerships will need fostering and incentives will assist to remove barriers and secure public and private investments that will deliver deep cuts in carbon emissions over a short period.

The South Australian community are national and international leaders on climate change action. The State Government and Council are signatories, to and active participants in, several international agreements, including the Compact of States and Regions, the Global Covenant of Mayors for Climate and Energy, the Under 2 MOU, and Regions Adapt. We will continue to find ways to meaningfully contribute to global efforts to tackle climate change.

In November 2015, the State Government and Council entered into a unique and strategic partnership to enable the city to become carbon neutral. The basis for the partnership is a sector agreement under the *Climate Change and Greenhouse Emissions Reduction Act 2007*. The agreement sets out the parties' shared ambitions for the City of Adelaide and the major focus areas for action.

Opportunities

Carbon Neutral Adelaide is a shared goal and will be delivered via a partnerships approach to the carbon reduction pathways outlined in the action plan. The opportunity is there to harness the existing energy of the South Australian community to focus on the shared goal of carbon neutrality. Through Carbon Neutral Adelaide Partnerships, the State Government and Council will work closely with a wide range of groups and organisations to build capacity, identify and address barriers, provide a competitive advantage, and improve access to resources and expertise. Table 1 (page 16) provides a brief outline of our Carbon Neutral Adelaide Partnerships approach.

The Partnerships initiative will contribute to and benefit from partnerships in different ways. For example, knowledge partners will be leaders in research and knowledge sharing; technology partners will contribute with specific technology products or individual trials; and ambassadors will be those organisations and individuals leading the way in reducing emissions in their own operations and supporting others in their aspirations.

Together we will identify and promote new business and investment opportunities arising from the city advancing its carbon neutral reputation. Businesses, organisations and households can get involved in ways that work best for them, and can share knowledge and practical ways to reduce emissions. For example, local businesses will be able to demonstrate their leadership in carbon reduction or product innovation to create a market advantage.

Recognition events and promotional opportunities will draw the world's attention to our progress, achievements and community leadership, and will help participants identify how their own actions will contribute to the pursuit of our shared goal.

Carbon Neutral Adelaide Partnerships will bring the community into the decision-making process. Although some large transformational investments such as transport infrastructure upgrades are long-term and multi-year initiatives, other decisions will be made over shorter timeframes and the State Government and Council will look to partners for input to priority setting.

We will continue to work closely with other cities through national and international partnerships to learn, collaborate and influence action.

Outcomes

1. Adelaide is a showcase city for world leading practices, technologies and services that grow the green economy and reduce carbon emissions.
2. There is broad community ownership, active participation and investment in Carbon Neutral Adelaide initiatives.
3. The community feels well-informed and supported to take action.
4. A supportive environment for early adoption of great ideas and technologies is created.
5. Businesses, households and other partners are making substantial contributions to emissions reduction in the city.
6. Opportunities are created and fostered for businesses to grow and prosper from the low carbon economy.
7. We share knowledge and celebrate our achievements.

As leaders, the State Government and Council will play a key role in:

- attracting investment and providing a supportive and enabling environment
- ensuring a coordinated, well-governed approach
- providing clarity on how the Carbon Neutral Adelaide aspiration can be met
- engaging widely across all sectors of the community
- catalysing community-led action and scaling-up initiatives to reduce cost
- sharing information and knowledge
- supporting research and development in low carbon technologies
- leading by example by taking strong action in our areas of operation.

Carbon Neutral Adelaide partners will play key roles in:

- identifying opportunities to take up early adoption of ideas or technology
- decision-making regarding priorities
- investing in technological solutions
- leading behaviour change programmes and encouraging each other
- talking about and sharing experiences.

Measures of success

1. One million square metres of city floor space is committed to Carbon Neutral Adelaide Partnerships by 2020.
2. One thousand businesses, institutions and individuals are involved in Carbon Neutral Adelaide Partnerships by 2020.
3. The community feels well-informed and supported to reduce their own carbon emissions.

Carbon Neutral Adelaide Partnerships framework and categories

Table 1: Carbon Neutral Adelaide Partnerships framework and categories

Partnership category	Ambassador	Building partner	Transport partner
Target audience and commitment	Organisations and individuals that share the aspiration and demonstrate leadership by committing to carbon neutrality for their own operations and/or in some other significant way.	Organisations and households that own, lease, manage or build commercial, public, community, industrial and residential buildings in the city and commit to deep emissions reduction targets.	Organisations that undertake to influence transport behaviours and commit to substantial actions that support emissions reduction.
Partnership category	Technology partner	Infrastructure partner	Knowledge partner
Target audience and commitment	Organisations that commit to actively pursue innovation and community uptake of technologies or services that bring forward deep cuts in emissions.	Organisations that own or maintain critical infrastructure or deliver supporting services required to achieve Carbon Neutral Adelaide and who commit to significant actions.	Organisations that generate knowledge, educate our community or supply the regular, robust and reliable datasets needed to demonstrate carbon neutrality.

Actions

Delivering in partnership		
Strategy P.1 Encourage community action through engagement and education programmes		Timing
P.1.1	Actively support the community through the establishment of the Carbon Neutral Adelaide Partnerships initiative by early 2017.	By March 2017
P.1.2	Promote thought leadership, innovation and entrepreneurialism through delivery of the Adelaide to Zero Carbon Challenge.	2016–2017
P.1.3	Support investment and product innovation through the establishment of a Climate Knowledge Innovation Community (Climate KIC) initiative in Australia.	2016–2018
P.1.4	Implement sustainable behaviour change programmes to secure active participation in Carbon Neutral Adelaide initiatives including: <ul style="list-style-type: none"> • office-based businesses • residents • schools and universities • major and medium-sized events. 	Ongoing
P.1.5	Progress research and development into low carbon industries and lifestyles including: <ul style="list-style-type: none"> • the Cooperative Research Centre for Low Carbon Living • university research programs. 	Ongoing
P.1.6	Participate in industry development, leadership and knowledge sharing networks including the States and Regions Alliance, CDP, Carbon Neutral Cities Alliance, Climate Neutral Now, and the Sister City Program.	Ongoing
P.1.7	Pilot a carbon neutral schools program in the City of Adelaide.	2017–2020
P.1.8	By the end of 2017, develop a 'Low Carbon Economy Plan' for the city that will aim to: <ul style="list-style-type: none"> • maximise opportunities for business leadership and entrepreneurs • accelerate the decoupling of economic growth and carbon emissions • identify indicators to measure and report on the city's transition to a low carbon economy. 	By December 2017

Carbon Neutral Adelaide Pathways



Our partnerships will reduce emissions along carefully defined pathways to deliver on multiple strategic objectives for the city.

As partners celebrate emissions reduction results and make tangible steps towards the carbon neutral destination, the community will be inspired to do more and build on the momentum. Our dynamic community will join us in creating a green, smart, liveable and creative city; a climate-resilient city.

Pathways to carbon neutrality

1. Energy efficient built form

Drive investment in energy efficiency of city buildings and other infrastructure, and green the streetscapes and open spaces.

2. Zero emissions transport

Decarbonise transport and change the way we travel to and in the city.

3. Towards 100% renewable energy

Continue to drive investment in large-scale renewable energy generation and storage in the state, and encourage the uptake of small scale renewable energy supply and storage in the city.

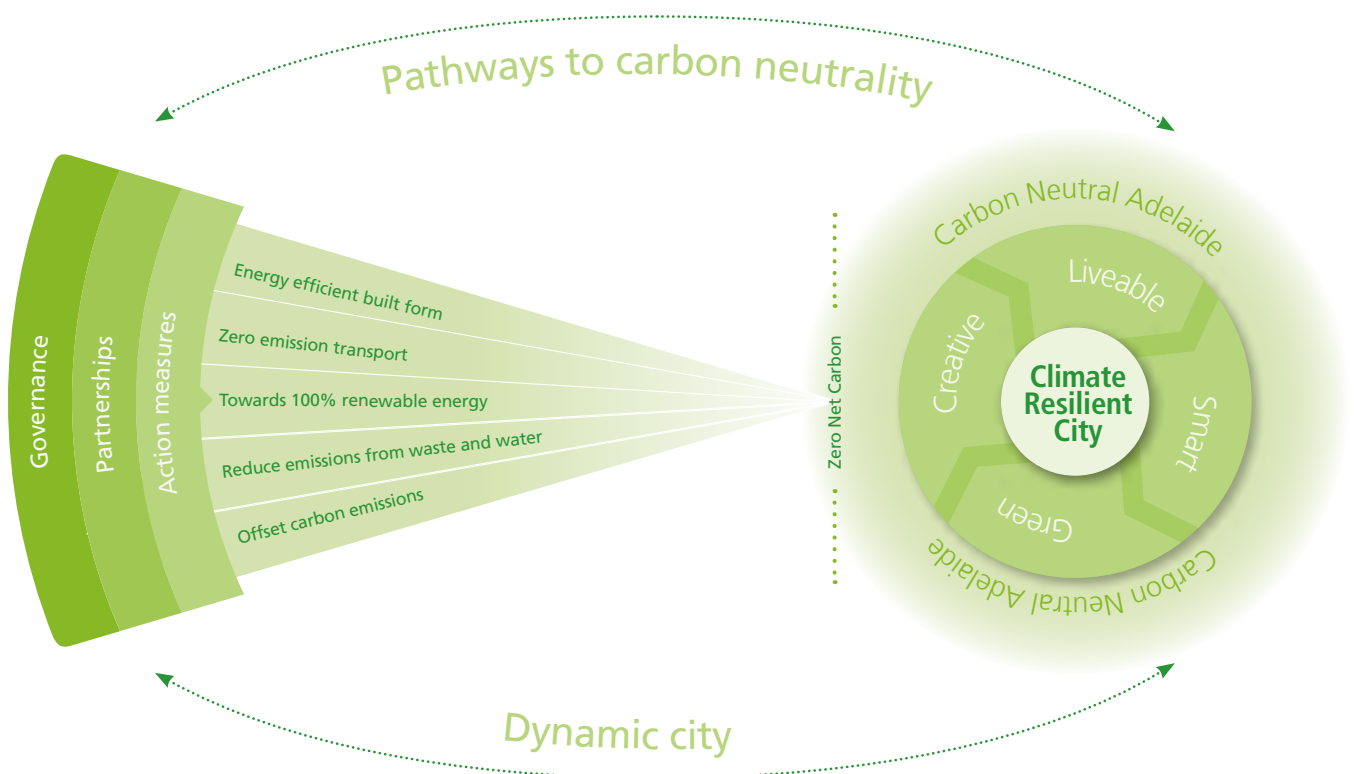
4. Reduce emissions from waste and water

Build on South Australia's leadership in resource recovery and diversion of waste from landfill.

5. Offset carbon emissions

Reduce emissions rapidly in every way we can, and offset the remaining emissions when appropriate timing has been confirmed with our partners.

How will we get to a climate resilient city



PATHWAY 1:

Energy efficient built form



Current situation

Electricity and gas consumed within the City are the primary sources of carbon emissions for the City of Adelaide, accounting for 60% of total emissions in 2015.

Commercial and apartment buildings are the City's largest consumers of electricity, accounting for 48% of total emissions in 2015. Electricity consumption in this sector has been declining since 2007. This significant achievement is mainly due to a range of policy measures, including greater use of the National Australian Built Environment Ratings System (NABERS) to benchmark building performance (including Commercial Building Disclosure), and the State Government's long-standing policy to require new government office leases to attain a five-star NABERS rating. This trend is also seen in the residential sector, where electricity consumption has also been declining, due to factors such as solar photovoltaic installations, behaviour changes in response to electricity price increases, and energy efficiency initiatives.

Opportunities

Improving energy efficiency and switching to renewable energy are complementary policy measures that will deliver significant cuts in emissions and financial savings to the community. Energy efficiency is recognised worldwide as a highly cost-effective emissions reduction strategy, and renewable energy continues to gather momentum globally as a fundamental long-term action for achieving deep cuts in emissions. The Siemens City Performance Tool has identified that emissions from buildings could be reduced 15% by 2025 and create more than 1,700 full time equivalent jobs with the implementation of just one technology – energy efficient double glazing (Appendix 2).

Most of the emissions from stationary energy are from activities that occur within buildings such as shops, offices, and residential and commercial buildings. Most buildings in the City are privately owned and therefore beyond the direct influence of the State Government and Council. Our roles are therefore to provide support and facilitation, and to lead by example through aggressive energy efficiency measures in our own operations.

A key action that aims to trigger widespread energy efficiency refurbishments in existing buildings is the recent establishment in South Australia of Building Upgrade Finance, a mechanism to help building owners access loans with superior commercial terms to improve the energy, water and environmental efficiency of their buildings.

Fundamental policy levers for energy efficiency in new buildings and major refurbishments are established at the national level, particularly the mandatory minimum energy performance standards in the National Construction Code. Full application of such standards in the city, and awareness-raising of the diverse benefits from energy efficient buildings, can make a substantial contribution to emissions reduction.

The energy use of buildings is influenced greatly by external conditions, and buildings in a hot environment can use significantly more energy than similar buildings in a cooler setting. Measures to cool the city and reduce the heat island effect can play an important role in reducing building energy use and carbon emissions. Increasing the coverage and use of city greening (street trees, community gardens, plantings, green walls, and green or cool roofs), including water sensitive urban design, can therefore deliver a range of positive outcomes including emissions reduction, improved water management, and a more liveable and attractive city in a changing climate.

ACHIEVEMENTS



- Energy efficiency of South Australian Government owned and leased buildings improved by 24% from 2001-2014
- Adelaide City Council has reduced its operational energy use by 15% since 2010
- From 2007-2013 city office floor area grew by 243,000m² or 16%, yet through best practice green building design, energy efficiency and renewable electricity, emissions declined by 23%
- The CitySwitch Green Office Program includes over 3 million m² of office-based business floor space nationally

Benefits

1. Recent studies confirm that improved energy efficiency in the commercial sector provides significant financial returns through reduced heating, ventilation and air conditioning (HVAC) and lighting expenditures.
2. Lighting upgrades to the most efficient LED and fluorescent technology have been estimated to potentially reduce annual energy use in this area by 43% by 2030.
3. HVAC retrofits with higher efficiency systems, control and building management systems, and improved building insulation can potentially reduce gas and electricity use in these areas by 34% and 43% respectively by 2030 (Climate Works 2016, pitt&sherry 2012).
4. A 2015 review of research by the CitySwitch Green Office Program indicated that businesses in high performance commercial buildings benefit from reduced absenteeism, increased employee retention and improved staff productivity. For a 1,000m² office, this could translate to annual savings of up to \$950,000.
5. The potential for delivering such building upgrades at large scales in the city's buildings would create a significant employment and economic development opportunity.

Outcomes

1. The energy efficiency of the city's existing and new buildings and street lighting is significantly enhanced.
2. Under-utilised and heritage buildings are upgraded or adapted for re-use.
3. Our international reputation attracts low carbon investment, supports early adoption of technologies and increases consumer demand.
4. A greener city creates a more sustainable lifestyle, attracts more residents and visitors, and creates business opportunities.
5. City parks, streets and green roofs are alive with activity and central to our identity.

Measures of success

1. Community actions deliver annual financial savings.
2. The energy efficiency of State Government and Council buildings is improved by 30% by 2020.
3. The proportion of the State's electricity generated from renewable sources is increased to 50% by 2025.
4. 400,000 m² (20%) of City office floor area is participating in the CitySwitch Green Office Programme by 2021.
5. 250,000 m² (50%) of commercial car park floor area has been upgraded to high efficiency light systems, including LED fittings and smart controls, by 2021.
6. Green coverage in the existing built-up areas is increased by 100,000 m² by 2020.
7. 1,000 trees planted in the built-up areas of the city by June 2020.

Actions

Delivering in partnership		
Strategy 1.1 Encourage energy efficient and adaptive reuse of commercial buildings		Timing
1.1.1	Implement the Building Upgrade Finance mechanism in South Australia by early 2017.	By March 2017
1.1.2	Support the adaptive reuse of under-utilised and heritage listed buildings.	2017–2021
Strategy 1.2 Support community uptake of efficiency technologies		Timing
1.2.1	Reduce cost barriers to improving energy efficiency by continuing to provide energy efficiency incentives through the Sustainability Incentives Scheme and the Retailer Energy Efficiency Scheme (REES).	Ongoing
1.2.2	Investigate an incentives program linked to NABERS rating improvements for mid-tier office buildings (PCA Class B, C and D rated).	2018–2021
1.2.3	Continue to support office based businesses through joint delivery of the CitySwitch Green Office Program.	Ongoing
1.2.4	Foster design leadership in energy efficiency, reduced embodied energy and increase renewable energy systems in new developments.	2016–2021
1.2.5	Support and encourage tenants in Government and Council owned buildings to undertake energy efficiency upgrades and install renewable energy systems.	2016–2021
1.2.6	Facilitate and case manage decentralised energy generation within significant development sites.	2017–2021
Strategy 1.3 Utilisation of regulatory levers to encourage energy efficiency uptake		Timing
1.3.1	Support progressively lowering the Commercial Building Disclosure threshold and advocate for extension to the residential sector by 2020.	2016–2019
1.3.2	Pilot the provision of incentives for voluntary disclosure of residential energy efficiency at point of sale or lease for new apartments by the end of 2018.	2017–2020
1.3.3	Lead the National Energy Efficient Buildings Project (NEEBP) and implement findings that improve the capacity of regulators and industry to deliver energy efficient buildings.	2016–2020
1.3.4	Investigate the level of energy efficiency compliance in developments and effective measures to secure compliance, including: <ul style="list-style-type: none"> • increasing routine building construction and planning inspections for thermal performance, energy efficiency and sustainability • e-passports for buildings • disclosure of energy efficiency at point of sale or lease. 	2016–2020

Strategy 1.3 Utilisation of regulatory levers to encourage energy efficiency uptake		Timing
1.3.5	Support investigations into improvements to the energy efficiency provisions of the National Construction Code, by completing a cost benefit analysis on raising performance requirements for Class 2 buildings, to enable progressively and substantially increasing the minimum standards required of residential and commercial buildings in 2019.	2016–2019
1.3.6	Review prescribed machinery, plant and equipment in the <i>Valuation of Land Regulations 2005</i> to support investment in energy efficiency and sustainability upgrades.	2017–2018
1.3.7	Facilitate an energy hierarchy in the built form, including through the <i>Planning, Development and Infrastructure Act</i> implementation, as follows: <ul style="list-style-type: none"> • low carbon design and construction measures • passive design • supplying energy efficiently, in particular by encouraging decentralised energy generation and embedded networks • large scale renewable energy. 	2017–2018
Strategy 1.4 Reduce climate impacts in city streetscapes		Timing
1.4.1	Deliver the City Laneways Masterplan to identify priority streets and guide future development of the laneways between the Adelaide Railway Station and the Adelaide Central Market.	2017–2019
1.4.2	By the end of 2017, develop a 'Green City Plan' that will increase city greening through trees, gardens, plantings, green walls and green or cool roofs.	By December 2017
Government and Council operations		
Strategy 1.5 Energy efficient buildings and public lighting		Timing
1.5.1	Strengthen the SA Government's Buildings Energy Strategy 2013–2020 to reflect the Carbon Neutral Adelaide ambitions.	By October 2017
1.5.2	Complete benchmark energy ratings (NABERS or alternative) for all Government and Council owned or occupied office buildings and tenancies.	2016–2020
1.5.3	Undertake energy efficiency upgrade opportunities under the Government Building Energy Efficiency Investment program in all Government and Council owned or occupied buildings and implement projects with simple paybacks of seven years or less.	2016–2020
1.5.4	Increase building standards to a minimum 5 Star Green Star interiors and performance rating for new builds and substantial refurbishments.	2017–2021
1.5.5	Strengthen leasing policies to include consideration of leading industry standards such as Green Star Office Interiors, NABERS Office Water and Waste and emerging carbon neutral standards.	2016–2019
1.5.6	Partner with industry to promote and showcase the advantages of high performance buildings.	Ongoing
1.5.7	Upgrade all Council owned public street and footpath lights to high efficiency LED and controls by 2020.	2016–2020
1.5.8	Showcase the New Adelaide High School Campus by achieving a 5 Star Green Star Rating or above.	2016–2020

Case study 1: Building Upgrade Finance

The South Australian Government committed \$1.9 million to establish Building Upgrade Finance (BUF) in South Australia through the 2014 election.

BUF is a mechanism that helps building owners access commercial loans to help fund their works to improve the energy, water and environmental efficiency of their existing commercial buildings. Consistent with advice from the Premier's Climate Change Council, and the results of public consultation, the Government recently passed the *Local Government (Building Upgrade Agreements) Amendment Act 2015*, which provides for the implementation of the BUF mechanism in South Australia. The Government is now developing the remaining elements needed for the mechanism to become operational. These include the development of regulations, a building upgrade agreement template and a 'no worse off' methodology for estimating tenant cost savings, an early adopter program and the establishment of a central administrator.

The mechanism is designed to overcome barriers to environmental upgrades of the existing commercial buildings, including access to finance and the split incentive barrier, where the building owner incurs the cost of the upgrade but the tenant receives the benefits through reduced utility bills and improved accommodation. The mechanism has the potential to facilitate upgrades that improve the carbon footprint and environmental performance of our existing buildings and can help revitalise South Australia's built environment by facilitating upgrades of our ageing buildings.

The BUF mechanism is voluntary for building owners, financiers and local councils. The mechanism will support Carbon Neutral Adelaide and generate multiple environmental and economic benefits by stimulating jobs and investment in the property sector, providing opportunities for local manufacturers and suppliers of clean technologies, improving the quality and amenity of buildings, and reducing the impact of rising energy and water costs on businesses.



PATHWAY 2:

Zero emissions transport



Current situation

Emissions from transport contributed 35% of total emissions for the city in 2015. Major initiatives are required to pursue deep decarbonisation of our transport system.

The decarbonisation of our public transport system is already underway. Since 2007, the Australian and South Australian Governments have invested \$2.6 billion to revitalise the public transport network, including extending light rail (tram) through the city, and upgrading and electrifying the Adelaide Metro rail system.

Private vehicles are the most dominant form of transport in the city, contributing 91% of Adelaide's total transport emissions in 2015 while public transport contributed only 8%. Traffic survey videos in 2015 confirmed this dominance, finding that passenger cars accounted for approximately 94% of all vehicles using City streets.

There are significant barriers that need to be addressed to achieve decarbonisation of the light passenger vehicle fleet. These include the slow rate of renewal in the fleet (5–6% per year), the absence of major technological leaps in fuel efficiency for new internal combustion engines, and the high capital cost of low and zero carbon vehicles. Over time the relative contribution of the transport sector to the emissions profile of the city will increase as reductions from the stationary energy sector are expected to drop at a faster pace than transport.

Opportunities

Reducing transport emissions may be the greatest of our emissions reduction challenges, due to the complexity of the transport options available, the high cost of zero carbon vehicles, and the significant influence of affordability and demographics on individuals' transport choices. Nevertheless, the South Australian Low Carbon Economy Experts Panel advised that electrification and fuel switching in the transport sector could provide significant opportunities to reduce emissions in the city. Siemens, in their City Performance Tool report for Adelaide, found that under a low emissions private vehicle scenario, by 2025 transport sector emissions could be reduced by 47% (see Appendix 2 'Siemens City Performance Tool' for further information).

A number of opportunities will be pursued to move towards a zero emissions transport system. This includes providing safe, convenient and comfortable streets that incorporate more trees and bike lanes, coupled with community engagement programs that encourage people to walk and cycle. Other opportunities include encouraging the uptake of low and zero emission vehicles, expanding the tram network and completing electrification of the rail network (see case study 2 'Tram extension and AdelINK' for further information).

ACHIEVEMENTS



- \$2.6 billion has been invested since 2007 to extend the tram network and electrify the train network.
- Cycling journeys in and through the city have doubled since 2003.

Benefits

1. Low and zero emission electric vehicles, cycling and walking will contribute to noise reduction and local air quality improvements, further enhancing liveability and public health outcomes.
2. Improving conditions for pedestrians and cyclists and enhancing public transport services will grow total visitors to the city.
3. Investments in electric vehicle charging will support a shift away from fossil fuels and address the need for car accessibility to be maintained.
4. The financial savings such as in fuel and operating costs of a range of transport related policy measures have been calculated to be greater than the present value of implementation costs.

Outcomes

1. Low and zero emission vehicles are preferred for motorised travel in the city.
2. Access to the city is enhanced for pedestrians, cyclists, public transport and private vehicles.

Measures of success

1. Increase the use of public transport to 10% of metropolitan weekday passenger vehicle kilometres by 2020.
2. Double the number of cycling trips in the city by 2020.
3. Commercial buildings with secure bicycle parking is increased to at least 200 by 2020.
4. Commercial buildings with secure bicycle parking and end of trip facilities is increased to at least 100 by 2020.
5. Increase the proportion of hybrid and electric vehicles to 15% of new South Australian passenger vehicle registrations by 2021, on the way to at least 30% by 2025.
6. Increase the number of publicly accessible electric vehicle recharge points in the city to 250 by 2020.
7. Increase the percentage of low emission passenger vehicles in the State Government and Council vehicle fleet to at least 30% by 2019.
8. The number of registered car share service members in South Australia is more than 10,000 by 2021.

Actions

Delivering in partnership		
Strategy 2.1 Zero net emissions from public transport		Timing
2.1.1	Implement a City of Adelaide Net Zero Emissions Transport Plan 2017-2025 that includes: <ul style="list-style-type: none"> • maximising biodiesel as a transition fuel for existing public transport vehicles; • evaluation of electric and Euro 6 buses; • expansion of the Free City Connector Bus service to include a second route for the New Royal Adelaide Hospital by 2018; • utilising 100% renewable energy for the tram and train networks; and • phasing out the purchase of conventional fossil fuel buses by no later than 2025. 	2016–2021
2.1.2	Evaluate electric buses and potential on-route charging infrastructure for the Adelaide Metro bus fleet, with the aim of establishing a 100% electric Free City Connector Bus service by 2020, and an all-electric 'Go Zone' route by 2025	2016–2018
2.1.3	Commence the upgrade and electrification of the Gawler train line in 2017–18.	2017–2021
2.1.4	Deliver Stage 1 of the AdeLINK network along North Terrace to the East End by 2018 and completion of two suburban links by 2020.	2016–2020
2.1.5	Complete a study on the electrification of public transport in Adelaide including AdeLINK.	2016–2018

Strategy 2.2 Increase the frequency and quality of public transport services		Timing
2.2.1	Complete the O-Bahn City Access Project by the end of 2017.	By December 2017
2.2.2	Upgrade Grenfell Street and Currie Street to Light Square as a transit pedestrian precinct with enhanced facilities for public transport patrons by 2020.	2016–2020
2.2.3	Review the Adelaide Metro bus system to determine opportunities for establishing a strategically aligned, integrated and connected network.	2016–2020
Strategy 2.3 Increase uptake of Low Emission Vehicles (LEVs)		Timing
2.3.1	Review and update the Low Emissions Vehicle Strategy to place a greater emphasis upon electric vehicle initiatives and other emerging technologies such as hydrogen fuel cell vehicles.	2016–2017
2.3.2	Investigate incentives for increasing the purchase of electric vehicles and installing public recharging infrastructure.	2016–2018
2.3.3	Investigate an electric vehicle bulk purchase scheme for the South Australian community by the end of 2018.	2016–2018
2.3.4	Through the Australian Government’s Ministerial Forum on Vehicle Emissions, advocate for: <ul style="list-style-type: none"> • introduction of Fleet Average Fuel Efficiency Standards that include additional incentives for electric and other zero emission vehicles • removal of Federal taxation measures that disproportionately impact on electric vehicles • alignment of the vehicle purchasing policies of state and local governments to improve the business case for auto manufacturers to bring new electric and zero emissions vehicles to Australia. 	2016–2021
2.3.5	By the end of 2017, determine the feasible number of on-street parking bays that will provide recharging services by 2020 and then 2025.	By December 2017
2.3.6	Install on-street electric vehicle and electric bicycle recharging points and pilot an Internal Combustion Engine (ICE) to Electric Vehicle (EV) Parking Space Management System at the Adelaide Central Market UPark.	2016–2021
2.3.7	Provide incentives for the installation of electric vehicle and electric bicycle charging infrastructure, including in public car parks and connecting to regional networks such as the Adelaide to Kangaroo Island electric highway.	2016–2020
2.3.8	Encourage 100% renewable energy for all electric vehicle recharging.	Ongoing
2.3.9	Provide on-street fast recharging infrastructure to facilitate the transition of the taxi, chauffeured vehicle and car share industries to electric vehicles.	2017–2020
Strategy 2.4 Support electric vehicle innovation		Timing
2.4.1	Continue to host the World Solar Challenge and Celebrate the 30th anniversary of the World Solar Challenge in 2017.	2016–2021
Strategy 2.5 Enhance access to commercial car share services		Timing
2.5.1	Provide operational certainty for commercial car share companies and promote the benefits of services to residents, businesses and visitors and encourage electric vehicles as share cars.	2016–2018
2.5.2	Increase the supply of public car share vehicles, by enabling and promoting staff use of commercial car share services for Council and Government business purposes.	2016–2018

Strategy 2.6 Reduce single-occupancy vehicle use		Timing
2.6.1	Influence personal transport choices through program such as: <ul style="list-style-type: none"> • TravelSmart households • Smarter travel@ work • Way to Go primary schools program • Car Pool South Australia. 	Ongoing
Strategy 2.7 Optimise the efficiency of existing road and public transport networks		Timing
2.7.1	Through Operation Moving Traffic optimise traffic flows to improve transit times and more consistent travel flows to and from the city.	2016–2018
Strategy 2.8 Develop integrated cycling and walking networks		Timing
2.8.1	Establish a cycling infrastructure fund and develop a comprehensive and integrated network of bicycle ways that connect Adelaide, North Adelaide and surrounding suburbs to provide safe and convenient access to workplaces, services, shops, leisure activities and bus, train and tram services.	2016–2021
2.8.2	Implement a point to point Adelaide Bicycle Share Scheme.	2016–2020
2.8.3	Provide secure bicycle facilities at more suburban train stations.	2016–2019
Strategy 2.9 Increase the transport advantages of city and apartment living		Timing
2.9.1	Facilitate a shift to sustainable transport modes and reduced private car ownership, including through the <i>Planning, Development and Infrastructure Act</i> implementation, as follows: <ul style="list-style-type: none"> • encourage design innovation for electric and autonomous vehicle technology • reduced onsite parking requirements where alternatives such as car share and cycling are available • application of end of trip facilities and bicycle parking standards in new developments • designing for comfortable pedestrian environments • convenient placement of stairs and bicycle storage areas within buildings. 	2017–2021
Government and Council operations		
Strategy 2.10 Reduce emissions from business trips		Timing
2.10.1	Transition to zero and low carbon vehicles and fuels including 30% of the Government and Council passenger fleet to be electric, hybrid, and low emission vehicles by 2018.	2016–2018
2.10.2	Implement a procurement plan for all Council vehicles to be low or zero emissions by 2025.	2017
2.10.3	Investigate electric heavy vehicle trials for the city in conjunction with key industry partners.	2017–2018
2.10.4	Transform business trip transport choices through participation in engagement programmes that prioritise walking, cycling, public transport and commercial car share over regular pool vehicle usage.	2016–2021
2.10.5	Provide staff with convenient access to pool bicycles and Adelaide Metrocards for all business trips.	2016–2021
2.10.6	Minimise emissions from transport through greater use of technologies including video conferencing.	2016–2020

Case study 2: Tram extension and ADELINK

The City tramline will be extended along North Terrace to Adelaide's East End precinct, in a \$50 million expansion delivering the first stage of the *AdeLINK* tram network. The extension will feature three new stops servicing the universities and the future development precinct at the Old Royal Adelaide Hospital site.

The Adelaide City Council will contribute an additional \$5 million to help fast-track the project, by providing upgrades to the public realm and contributing to the planned East End tram stop.

The *AdeLINK* tram network is a project encompassing the extension of Adelaide's light rail network. It is a transformational investment in the city's transport infrastructure that will lead to deep cuts to emissions.

It has been endorsed as a priority initiative by Infrastructure Australia and follows the Government's Integrated Transport and Land Use Plan. Project components include:

- **EastLINK:** extending east through Kent Town to The Parade
- **WestLINK:** following Henley Beach Road to Henley Square, with a branch line to Adelaide Airport
- **ProspectLINK:** following O'Connell Street to Prospect Road
- **UnleyLINK:** following Unley Road and Belair Road to Mitcham
- **PortLINK:** using the existing Outer Harbor line with services to Port Adelaide, West Lakes and Semaphore.

Delivering the North Terrace tram extension and commencing advanced planning for the *AdeLINK* tram network across inner and middle Adelaide to enable completion of two suburban links will play a key role in further developing Adelaide as a modern, vibrant and liveable city. The project has the potential to attract investment, boost the economy and facilitate Adelaide's move to a carbon neutral city.



PATHWAY 3:

Towards 100% renewable energy



Current situation

In 2007 South Australia became the first jurisdiction in Australia to enshrine a renewable energy target in legislation. Currently, approximately 43% of South Australia's electricity is generated from renewable sources, including 34% from wind energy. Around \$6.6 billion has been invested in the renewable energy industry to date. The Low Carbon Investment Plan sets a target to attract \$10 billion in low carbon investment by 2025.

South Australia has one of the highest penetration rates of rooftop solar in Australia, with more than one in four households having a solar photovoltaic (PV) installation. The uptake in the City of Adelaide is lower than the South Australian average, largely due to the high density nature of the city. We have been addressing this by providing generous incentives for solar PV installations (see case study 3 'Sustainability Incentives Scheme' for further information).

Opportunities

Using renewable energy sources to meet 100% of the City of Adelaide's electricity requirements would bring widespread and systemic benefits, and is the measure that would make the single largest contribution to putting Adelaide on a rapid path to carbon neutrality. South Australia's Low Carbon Economy Experts Panel advised that, based on current indications, the state's electricity supplies could be almost completely decarbonised by 2050.

There are still many opportunities for replacing electricity from fossil fuels with renewable energy from sources such as wind, solar, geothermal and biofuel. The Low Carbon Investment Plan sets out the opportunities for increasing investment in low carbon energy generation, framed around four strategies that reflect where the major opportunities lie: clear policy settings and an efficient regulatory environment; accurate information to inform investment; sponsoring uptake and wider market deployment; and facilitating projects to leverage funding and support.

There are many opportunities for increasing the uptake of renewables within the city boundary. Financial and other incentives to encourage businesses and households to invest in solar photovoltaic systems and other renewable energy technologies will be continued. In addition, opportunities will be explored to scale-up the implementation of solar PV systems and energy storage to beyond the individual property level. An opportunity lies in supporting and showcasing emerging, cost-effective energy storage solutions.

The State Government and Council will lead by example and investigate fully decarbonising our electricity supply in the City. The State Government will also play an important role in advocating for supportive national policy frameworks and national renewable energy integration, including for a second electricity interconnection into the National Electricity Market via New South Wales.

ACHIEVEMENTS



- Around 43% of South Australia's grid electricity is sourced from renewable energy.
- \$6.6 billion has been invested in renewable energy since 2005.
- 35% of Australia's installed wind capacity is in South Australia.
- More than 1 in 4 homes in South Australia have solar PV installed.
- In 2014–15, the carbon intensity of South Australia's electricity grid was 35% lower than in 2005.

Benefits

Increasing South Australia's share of renewable energy generation can provide significant economic benefits for the state.

1. There were about 940 full time jobs in the renewable energy sector in South Australia in 2014–15.
2. Increasing demand for wind and large-scale solar projects provide benefits through regional investment, employment and economic output.
3. Modelling by the Climate Council found that a move to 50% renewable energy Australia-wide by 2030 could support the creation of more than 3,600 additional jobs in South Australia.

Outcomes

1. South Australia continues to lead Australia with its large-scale renewable energy generation.
2. There is a significant increase in renewable energy generation and battery storage capacity within the city.
3. New business and investment opportunities are triggered by our leadership in renewable energy.
4. Demand for renewable energy increases in the city.

Measures of success

1. Total installed capacity of solar PV in the city is increased to at least 15MW by 2021.
2. By 2019, Carbon Neutral Adelaide partners obtain at least 50GWh per year of electricity from large-scale renewable energy generators.
3. The proportion of electricity generated from renewable sources in South Australia increases to at least 50% by 2025.

Actions

Delivering in partnership		
Strategy 3.1 Increase investment in large scale renewables across the state		Timing
3.1.1	Implement the Low Carbon Investment Plan and associated initiatives to increase investment in renewable energy production in South Australia to \$10 billion by 2025.	2016–2025
3.1.2	Advocate for the establishment of a supportive national framework for renewable energy generation, electricity network upgrades, demand tariffs and energy market rule changes by 2020.	2016–2021
3.1.3	Undertake a study to review the feasibility of an additional interconnector to export renewable energy to Eastern states and increase energy security in South Australia.	2016–2017
Strategy 3.2 Increase uptake of renewable energy and battery storage		Timing
3.2.1	Provide incentives for the installation of renewable energy and energy storage systems in city buildings.	2016–2021
3.2.2	Deliver a renewable energy bulk purchase scheme, including consideration of community energy and virtual metering models by 2018.	2016–2018
3.2.3	Deliver programmes that enable access to solar PV systems and improved energy efficiency for low income and rental households, through the installation of up to 200 solar PV systems on Housing Trust properties in the city and at least 100 solar PV systems via the Solar Savers initiative.	2017–2021
3.2.4	Support and encourage large scale grid connected energy storage in South Australia.	2017–2021
Government and Council operations		
Strategy 3.3 Increase the percentage of renewable energy purchased directly for Government and Council operations		Timing
3.3.1	Enter into direct power purchase agreements for the supply of low carbon and renewable electricity for use in Government and Council operations.	2016–2019
3.3.2	Use the battery storage installations at the Adelaide High School, State Library of South Australia and South Australian Museum to monitor and verify the benefits and costs of energy storage technology and consider expansion to other government buildings.	2016–2018

Case study 3: Sustainability Incentives Scheme

The Adelaide City Council and the Department of Environment, Water and Natural Resources are co-funding the Sustainability Incentives Scheme, which provides rebates for investment in the installation of water and energy savings systems such as solar PV panels, solar hot water systems, energy storage systems, apartment building energy efficiency upgrades, electric vehicle charging points and rainwater tanks.

The scheme was expanded from a residents-only initiative in 2015, and is now available to all building owners and tenants including businesses, residents, schools, community and sporting organisations within the City of Adelaide.

In the first year of the scheme \$180,000 in rebates were paid, supporting more than \$2.5 million worth of sustainability investments.

In the 2015–2016 year 66 businesses, residents, not-for-profit and community organisations have engaged with the scheme to install solar panels, with over 1MW installed. This includes five large solar installations between 50–150kW that received funding under the scheme.

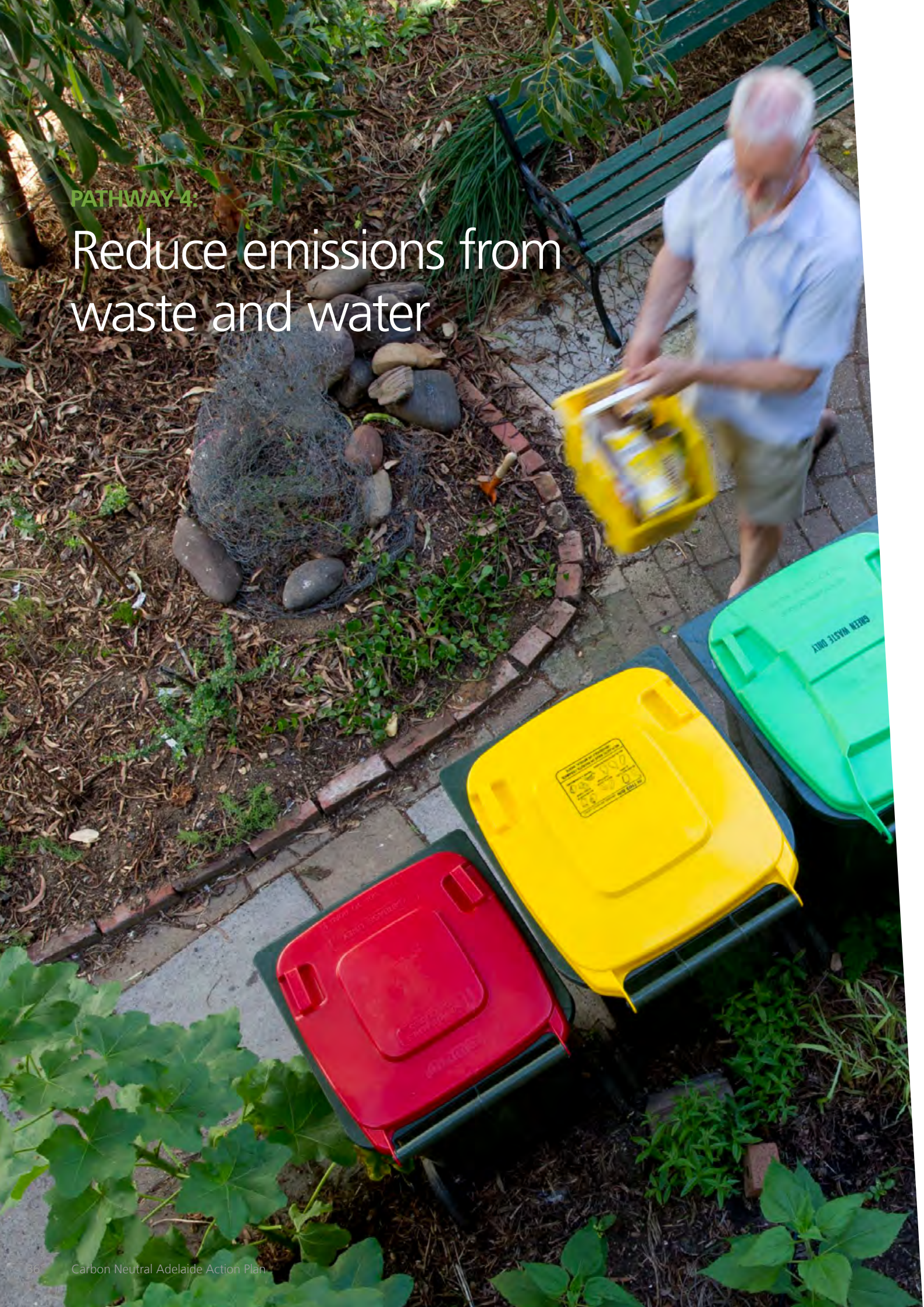
The scheme has also contributed to 876 halogen downlights being replaced with LEDs in city properties, with half of these being in small businesses.

It is estimated that these actions will result in approximately 1,000 tonnes CO₂-e of avoided emissions annually.



PATHWAY 4

Reduce emissions from waste and water



Current situation

Greenhouse gas emissions from waste currently contribute 5% of the City of Adelaide's carbon emissions, at approximately 43,000 tonnes. A major contributor to this is organic waste deposited in landfill, which produces large amounts of methane as it decomposes. Methane is a far more destructive greenhouse gas than carbon dioxide.

South Australia has a long history of leadership in waste reduction and recycling. While waste management remains a challenge for many Australian jurisdictions, South Australia's total diversion rate for commercial, industrial and municipal waste from landfill is Australia's highest at 79.7%.

Economic and population growth across the state has led to steady increases in solid waste over time, and waste projections suggest that volumes will continue to increase. Despite these challenges South Australia's total volume of resource recovery is Australia's highest at 2,135 kg per person per year.

While the City of Adelaide has achieved very high recycling rates in the construction and demolition sectors, recycling rates for municipal waste is lower than the state average due to the high concentration of townhouses and apartments.

Following extensive field testing by Adelaide City Council, in 2014 the Government released the Better Practice Guide - Waste Management for Residential and Mixed Use Developments, to influence design excellence and support high-quality services and improved recycling rates for residents in new high density developments.

Emissions associated with waste water are included in total City's emissions. Re-use of waste water has become more important in recent years due to the need to reduce nutrient discharge into the sea and extended periods of low rainfall. To address these problems, the Glenelg to Adelaide waste water pipeline (GAP) was constructed and currently provides irrigation water to the Adelaide Park Lands.

Opportunities

There are many opportunities to reduce the amount of waste disposed to landfill, especially in the diversion of garden and food waste from landfill. South Australia's Waste Strategy 2015–2020 will build on the state's success in waste reduction and build a resource efficient economy, a stable and efficient waste management market, and maintain a culture of zero waste for the state. Opportunities to develop and enhance a circular and sharing economy will also be pursued.

Opportunities exist in the city to encourage building developers, managers and owners to incorporate waste management systems that make recycling convenient and easy to use, and that prioritise organics and recycling collection services. Business engagement programmes will support increased uptake of food waste recycling services by the food and hospitality industries, which trail the residential sector in diversion of waste from landfill.

Public events are a prominent showcase of the city's progress towards minimising waste and maximising recycling. Enhancements to waste and recycling services at large events will be an important opportunity for leadership and community participation.

ACHIEVEMENTS



- South Australia's landfill diversion rate is Australia's highest at approximately 79.7%.
- Resource recovery is also Australia's highest at 2,135 kg per person annually.

Benefits

1. There is enormous economic potential arising from new technologies and the trend towards re-manufacturing.
2. South Australia is perfectly placed to capitalise on overseas business opportunities by supplying our expertise, knowledge and technology.
3. Growth opportunities exist for innovative companies that are developing new technologies for re-manufacturing products from recovered waste materials.
4. Analysis of Zero Waste SA's Industry Program revealed a net benefit of around \$7.8 million at a Benefit Cost Ratio of \$6.70 for every dollar invested by State Government in resource efficiency.

Outcomes

1. South Australia leads the world in recycling and minimising waste to landfill.
2. The city community participates in a circular and shared economy.
3. Construction activity in the city minimises waste and uses low carbon and recycled materials.
4. The South Australian composting industry further establishes its products in the consumer market place.
5. Financial savings from higher recycling rates are passed on to businesses by waste management service providers.

Measures of success

1. Diversion from landfill of municipal waste generated in the city increases to at least 60% by 2020.
2. Food recovery and organic waste recycling from food and hospitality premises is increased by 50% in 2020.
3. Increase the efficient use of recycled water from the GAP scheme for irrigation in the Adelaide Park Lands by 25% by 2020.

Actions

Delivering in partnership		
Strategy 4.1 Reduce emissions from solid waste		Timing
4.1.1	Build upon the leadership of major city events by adopting world leading recycling practices at all large and medium-size events by the end of 2020.	2018–2021
4.1.2	Implement new and expanded business and residential organics and recycling collection and support services to increase recycling rates for Council collection services to at least 60% by 2020.	2016–2020
4.1.3	Incentivise the use of recycling rather than waste services, including investigating gamification of individual and precinct level recycling rates.	2017–2021
4.1.4	Provide recycling rate information for multi-premise residential and business sites on the way to extending this service to individual premises by 2020.	2018–2021
4.1.5	Investigate procurement of precinct level waste and recycling services for business premises, to reduce heavy vehicle movements and improve the cost advantages of recycling services by June 2018.	2017–2018
4.1.6	Implement a precinct level trial of reusable and compostable takeaway food and beverage containers by businesses and catering companies.	2016–2018
4.1.7	Investigate circular economy opportunities, including sharing and waste avoidance opportunities within the City of Adelaide and South Australia.	2016–2018
4.1.8	Investigate and support energy from waste technologies, where appropriate, for generating renewable energy including organic waste.	2017–2021
4.1.9	Secure at least one carbon neutral main street food precinct by 2020.	2017–2020
4.1.10	Through the <i>Planning, Development and Infrastructure Act</i> implementation, codifying the <i>Better Practice Guide - Waste Management for Residential and Mixed Use Developments</i> to enhance the performance of waste and recycling systems in new developments by: <ul style="list-style-type: none"> • increasing routine building construction and planning inspections for thermal performance, energy efficiency and sustainability; • e-passports for buildings; and • disclosure of energy efficiency at point of sale or lease. 	2017–2020
Strategy 4.2 Improve emissions reduction and energy capture from liquid waste		Timing
4.2.1	By December 2020 increase the efficient use of recycled water from the Glenelg to Adelaide Park Lands (GAP) water recycling scheme.	2017–2020
4.2.2	Capture methane and use it to power the wastewater treatment plants in metropolitan Adelaide.	Ongoing

Strategy 4.3 Develop and share knowledge as we learn from our partners		Timing
4.3.1	Host the Seventh Regional 3R (Reduce, Re-use, Recycle) Asia Pacific Forum in November 2016 in Adelaide, supporting the organisation of the event with the Secretariat of the United Nations Centre for Regional Development (UNCRD).	2016–2017
4.3.2	Support and encourage application of the <i>Better Practice Guide - Waste Management for Residential and Mixed Use Developments</i> in new and existing developments.	2016–2020
4.3.3	Investigate waste generation volumes for commercial land use types and establish an enhanced methodology for calculating annual carbon emissions from solid waste by the end of 2017.	2016–2018

Government and Council operations

Strategy 4.4 Minimise waste to landfill from Government and Council operations		Timing
4.4.1	Maximise recycling and minimise waste to landfill from Government and Council buildings, facilities and services.	Ongoing

Case study 4: Reducing waste in high density buildings

The urban form of the city is changing, with more high density mixed-use buildings supporting rapid residential population growth.

Adelaide City Council and the State Government will work to support application of the *Better Practice Guide – Waste Management for Residential and Mixed Use Developments* to ensure convenient and effective recycling services in new and existing buildings.

To support developers and residents that adopt the recycling systems recommended in the Better Practice Guide, Council is introducing weekly waste, recycling and organics collections. At these sites, building managers and households will receive education and infrastructure support, including signage for bin storage areas and in-home recycling containers. To increase visibility of recycling rates in individual buildings, Council will track waste diversion volumes by stream (recycling, organics and waste) and use ‘gamification’ to help motivate recycling participation.

Learnings from servicing high-density residential buildings will be progressively incorporated into services provided by council to businesses.

PATHWAY 5:

Offset carbon emissions



Current situation

The measures outlined in the emissions reduction pathways in this plan will deliver deep cuts and position Adelaide as a leader in tackling climate change. The measures alone cannot reduce our emissions to zero in the near term, therefore becoming the world's first carbon neutral city will require the remaining emissions to be offset.

Using offsets to meet emissions targets is not new: both the State Government and Adelaide City Council already account for and offset the emissions from some operational activities, as do many businesses, institutions and individuals in the city. What is new is the expected scale of offsets required. For this reason, we will consult extensively on an appropriate approach, and seek innovation to maximise the benefits.

The National Carbon Offsets Standard (NCOS) and associated Carbon Neutral Program is an Australian Government accreditation program designed to ensure claims of carbon neutrality are credible. The program facilitates voluntary carbon offsetting by organisations and communities and provides a measuring and reporting standard that ensures genuine and credible emissions reduction when a carbon offset is purchased by an organisation or community. The Australian Government estimates that around one million tonnes of emissions are voluntarily offset by businesses and other organisations in Australia every year through the Carbon Neutral Program. The market availability of genuine and credible offsets generated from within South Australia is currently limited.

Opportunities

Obtaining carbon offsets from within South Australia would contribute to our State target of net zero emissions by 2050, and would deliver economic and environmental benefits to the State.

There are a variety of means by which the City of Adelaide's carbon emissions could be offset from emission reduction or sequestration activities within South Australia, including in the land, built environment, transport and waste sectors.

Opportunities exist to deliver additional economic and environmental benefits. For example, energy efficiency initiatives in the built environment can also reduce energy costs and improve the health and wellbeing of tenants. Offsets derived from the transport sector may also improve transport productivity through reducing congestion and improving air quality.

South Australia's Low Carbon Economy Experts Panel highlighted the significant opportunity for the land sector in South Australia to provide carbon sequestration. Many land sector emissions reduction activities deliver a range of other valuable benefits for landholders. For example, reforestation can reduce erosion and improve water quality, address salinity and provide habitat for native species. Some methods for reducing livestock emissions, such as feeding supplements to dairy cows, may also increase livestock weight gain. Increasing soil carbon can improve soil health, water retention and plant growth. The State Government will develop a state carbon sequestration strategy to support the development of the industry across South Australia.

ACHIEVEMENTS



- City of Adelaide's operational greenhouse gas emissions declined by 19% from 2007 to 2015

Benefits

The Clean Development Mechanism is the world's largest offset scheme. Since its inception in 2004, this United Nations scheme has delivered more than a billion tonnes of carbon reduction from developing countries while attracting much needed sustainable development and more than US\$215 billion in investment to these economies.

Depending on the nature of the carbon offsets investment, significant additional benefits may be gained for South Australia, such as:

1. Economic development would arise through agricultural production, forestry, waste management and employment.
2. Biodiversity benefits and other environmental outcomes may be achieved through native vegetation plantings soil conservation.
3. Employment opportunities would be created in the carbon offset sector, particularly for regional and Aboriginal South Australians.

Outcomes

1. We prioritise direct emissions reduction activities over offsets, and prefer offset projects based in South Australia and Australia.
2. Businesses obtain a competitive advantage through achieving carbon neutral operations.
3. The Australian National Carbon Offsets Standard and Program is used to support offsets that are genuine and credible carbon reductions.

Measures of success

1. Adelaide City Council operations are accredited carbon neutral by 2020.
2. State Government operations within the Carbon Neutral Adelaide boundary are accredited carbon neutral by 2020.
3. The City of Adelaide is accredited carbon neutral by 2025 or earlier.
4. Increased use of the Carbon Neutral Offset Standard and Program by businesses, events and organisations.
5. Through the Carbon Neutral Adelaide Partnerships, the timing and funding mechanism for carbon offsets is supported by the community.



Actions

Delivering in partnership		
Strategy 5.1 Offset residual community carbon emissions		Timing
5.1.1	Work with our partners, to develop a carbon offsets guideline, approach and plan.	2016–2018
5.1.2	Develop a State carbon sequestration strategy and identify bio-sequestration opportunities in South Australia.	By December 2017
5.1.3	Investigate South Australian and Australian abatement activities that could generate carbon offsets while delivering multiple benefits for local communities.	2016–2018
5.1.4	Implement a pilot program in which carbon offsets are purchased in a government and community partnership to learn more about the public value of carbon offsets and assist in the development of South Australian carbon offsets consistent with community wants.	2016–2019
5.1.5	Provide incentives to city based partner organisations that secure National Carbon Offset Standard (NCOS) carbon neutral certification.	From 2017
Government and Council operations		
Strategy 5.2 Offset residual Government and Council operational carbon emissions		Timing
5.2.1	Develop a carbon offsets guideline, approach and implementation plan for Council and Government operations to achieve carbon neutral accreditation by 2020.	2016–2020



Governance



ACHIEVEMENTS



- 2007-2013 Gross Regional Product increased by 28%
- Since 1990, South Australian carbon emissions have reduced by over 8% while the State's economy has grown by over 60%

The State Government and Adelaide City Council have set out their joint ambition for Carbon Neutral Adelaide in a sector agreement under the Climate Change and Greenhouse Emissions Reduction Act 2007. Delivery of this bold initiative will require strong governance, programme management, accountability and reporting mechanisms.

Measures of success

1. We publicly disclose greenhouse gas inventories for our operations and for the City of Adelaide, through the CDP Cities Program.
2. Adelaide City Council maintains compliance with the Global Covenant of Mayors for Climate and Energy.
3. The State Government maintains compliance with the Compact of States and Regions.
4. A stable and efficient market for investors and the community is maintained through a clear policy framework.

Actions

Delivering in partnership		
Strategy G.1 Provide overarching governance for the Carbon Neutral Adelaide initiative		Timing
G.1.1	Maintain and expand the Carbon Neutral Adelaide Steering Group, comprising senior managers from council, government and partner organisations, to oversee implementation of the Carbon Neutral Adelaide Action Plan.	Ongoing
G.1.2	Prepare an annual greenhouse gas emissions inventory for the City of Adelaide and Corporation of Adelaide and publicly disclose progress.	Annually
G.1.3	Publish an annual progress report on the Carbon Neutral Adelaide initiative.	Annually
G.1.4	Maintain compliance with membership requirements of international agreements, reporting frameworks and partnerships including; <ul style="list-style-type: none"> • Compact of States and Regions • Global Covenant of Mayors for Climate and Energy • Under 2 MOU • Regions Adapt • The Climate Group • CDP (formerly Carbon Disclosure Project) • Carbon Neutral Cities Alliance; and • Climate Neutral Now. 	Ongoing
G.1.5	Develop and maintain an interactive information platform for individuals and businesses to build their knowledge and understanding of their carbon footprint and actions that can be taken to reduce their carbon footprint.	2017–2018
G.1.6	Develop indicators to measure and report the City of Adelaide’s transition to a low carbon economy.	2017–2018
G.1.7	Partner with the education sector to develop and share knowledge on leading cities, businesses and individuals that are pursuing carbon neutrality and preparing for the impacts of climate change.	Ongoing
G.1.8	Partner with leading cities to improve data collection and modelling assumptions to continually improve the accuracy and integrity of community greenhouse inventories.	2017–2018

Appendix 1:

How do we measure our emissions?

It will be important that our progress in reaching net zero emissions is carefully measured and accounted for.

Annual reporting on progress will be based on the Greenhouse Gas Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC). The GPC is the best and most appropriate carbon accounting framework for compiling emissions inventories for a City such as Adelaide.

Since 2007 the Adelaide City Council has been undertaking greenhouse gas emission inventories to track emission changes overtime as shown in Table 2 below. An annual inventory will continue to be undertaken to monitor emissions reductions. The inventory will be independently verified and progressively enhanced to provide transparency and accountability of the inventory process. This also allows for appropriate international comparison between cities.

City of Adelaide emissions inventory

The emissions accounting approach embodied in the GPC is that the City should account for emissions that are attributable to activities and consumption patterns of the city. The scopes framework (the approach that the City of Adelaide uses for reporting its emissions inventory) clearly identifies emissions that occur inside the geographic boundary of the city (*Scope 1*), those that occur outside the boundary associated with electricity use inside the boundary, e.g. grid connected electricity (*Scope 2*) and other emissions outside the boundary associated with activities inside the boundary (*Scope 3*).

As reporting processes and data improves it is anticipated that from time to time total emissions will fluctuate based upon our understanding of emissions included. When such changes occur back casting of emissions to our base year of 2007 will be undertaken and published.

City of Adelaide greenhouse gas emissions inventory

Table 2: City of Adelaide greenhouse gas emissions inventory by sector 2007–2015 (* All figures are tonnes CO₂ -e)

	FY2007	FY2010	FY2013	FY2014	FY2015 ¹²
Commercial and apartment energy use	653,041	550,794	447,857	460,512	459,187
Residential energy use	47,822	42,239	31,996	31,177	31,304
Electricity transmission	92,598	95,511	83,926	82,846	81,212
Transport	339,106	335,686	332,267	330,575	329,637
Waste and water	43,063	44,495	43,743	47,088	50,583
TOTAL ACTUAL	1,175,630	1,068,727	939,788	952,198	951,923

City of Adelaide greenhouse gas emissions inventory scope

Currently included

- transport fuels used to access the City
- electricity and gas consumption
- energy production and electricity transmission losses
- industrial processes
- waste and waste-water
- other emissions such as fugitive gas from air conditioners.

May be included in the future

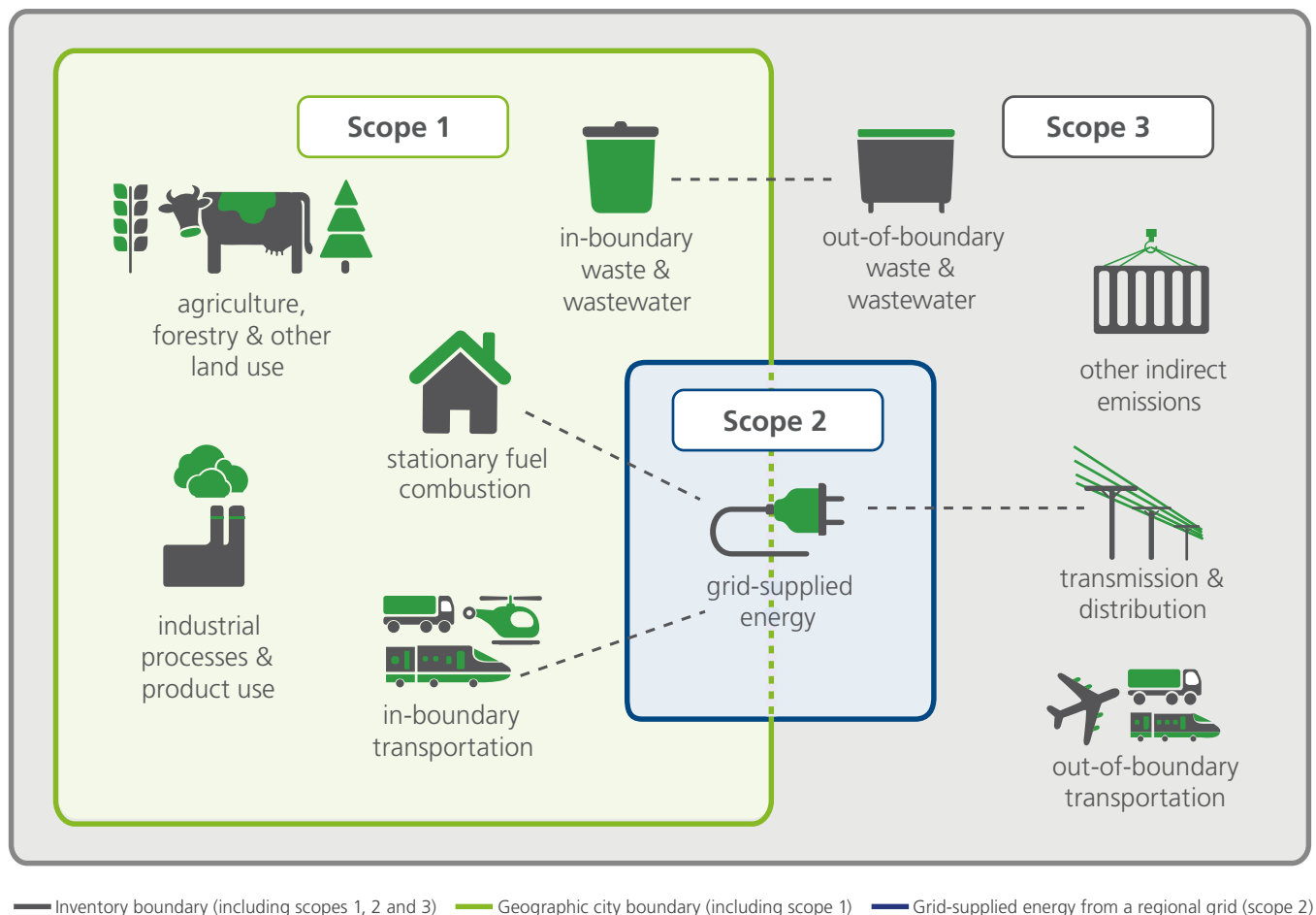
- aviation associated with business, recreational and event based travel
- product usage
- other indirect emissions.

Not included

- traffic through the City when the destination is not the City
- embodied energy in buildings and the public spaces
- agriculture, forestry and other land uses.

Explanation of the GPC Scopes Framework

Figure 3: Explanation of the GPC Scopes Framework



Appendix 2:

Siemens City Performance Tool

The Siemens City Performance Tool (CyPT) report has been undertaken in 13 cities worldwide, including San Francisco, London, Vienna and Shenzhen, and Adelaide is the first Australian city to undertake the review. The findings are a valuable contribution to the Carbon Neutral Adelaide discussion.

Adelaide's evaluation analysed over 700 data inputs from transport, energy and building sectors to identify the most promising technologies to mitigate greenhouse gas emissions, improve air quality, create new local employment and achieve our Carbon Neutral Adelaide goal.

The CyPT compares the performance of over 70 technologies and creates a shortlist of the most cost-effective solutions. Underpinning the tool is a model comprising 350 different inputs across the City of Adelaide's transport, energy and building sectors, consisting of the electricity generation mix, modes of transport and typical energy, travel and building space demand. A summary evaluation report was released in September 2016.

The City Performance Tool report demonstrates that there is enormous technological and economic potential from Carbon Neutral Adelaide.

Siemens found that:

- Coordinated action by the City of Adelaide and State Government could yield emissions reduction of up to a further 56% from 2015 by 2025 over a business-as-usual scenario.
- Decarbonisation efforts need to span energy, buildings and transport.
- Commercial buildings should be the first target for emissions reduction, being the largest source of emissions and a sector that Council and the State Government can influence through mechanisms such as Building Upgrade Finance (BUF). Transport-related emissions could be reduced by 47% under a scenario of medium level investment in public transport and high level of uptake of low emission vehicles, and by 38% under an inverse scenario.
- Nearly 23,000 total full time equivalent jobs in low carbon energy, public transport mobility and building systems could be created over the next decade by implementing the key activities.



Under the energy technology scenario, increasing the share of wind and solar power generation by 10% of the standard projected scenario to 2025 could reduce emissions by as much as 20%, attract a capital investment of \$300 million and create around 2,000 full time equivalent jobs in installation, operations and maintenance of energy infrastructure.

The Siemens report provides many interesting analyses. For example, if 3% of total building stock was retrofitted annually with double glazing on windows, 65% of city building stock could be fitted by 2025, reducing building sector carbon emissions by as much as 15%, reducing city emissions by 5%, and creating 1,700 new full time jobs. When this investment is combined with the decarbonised electricity scenario above, city emissions could be reduced by as much as 21% and building sector emissions by 63%. \$613 million in capital expenditure could be stimulated and up to 3,420 full time jobs could also be created.

The transport technology scenario shows that under a low emissions private vehicle scenario, by 2025 city carbon emissions and transport sector emissions could be reduced by 31% and 47% respectively, up to \$1.4 billion in capital expenditure could be stimulated, and up to 5,600 full time jobs created. Alternatively, under a strong public transport scenario, city-wide and transport sector emissions could be reduced by 26% and 38% respectively, creating 21,000 full time jobs and stimulating \$4.9 billion in capital expenditure.

Multiple performance indicators for top performing technologies identified in the Siemens City Performance Tool (Siemens, 2016).



Glossary

- 1. Carbon Dioxide Equivalent (CO₂-e)**

An internationally accepted measure that encapsulates all greenhouse gases based upon their global warming potential. Different greenhouse gases have different warming potentials.
- 2. Carbon emissions**

The release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time. The term carbon emissions is utilised interchangeably with the term greenhouse gas emissions.
- 3. Carbon Neutral**

Net greenhouse gas emissions are zero. This can be achieved by preventing or offsetting emissions (e.g. by supporting a tree planting scheme that will absorb carbon dioxide), or a combination of the two.
- 4. Carbon emission offsets**

Reduction in emissions of carbon dioxide or greenhouse gases made in order to compensate for or to offset an emission made elsewhere
- 5. Climate Change and Greenhouse Emissions Reduction Act 2007**

South Australian legislation to provide for measures to address climate change by setting targets to achieve a reduction in greenhouse gas emissions within the state; to promote the use of renewable sources of energy; to promote business and community understanding about issues surrounding climate change; and to facilitate the development of policies and programs to address climate change.
- 6. Conference of Parties (COP)**

The Conference of Parties is a reference to the (at time of publication) 196 signatories of the United Nations Framework Convention on Climate Change.
- 7. Decarbonisation**

The reduction or removal of carbon dioxide and other greenhouse gases from energy sources or the atmosphere.
- 8. Euro 6**

The European fuel emission standard for light passenger and commercial vehicles.
- 9. Gamification**

The application of game-design elements and game principles in non-game contexts. Gamification commonly employs game design elements which are used in attempts to improve user engagement.
- 10. Greenhouse gas emissions**

The release of greenhouse gases into the atmosphere. A greenhouse gas is an atmospheric gas that absorbs and emits infrared or heat radiation, giving rise to the greenhouse effect. Typical greenhouse gases include carbon dioxide, methane, nitrous oxide and refrigerants. The term carbon emissions is utilised interchangeably with the term greenhouse gas emissions.
- 11. Gigawatt hour (GWh)**

A unit of electrical energy equal to one billion watt hours.
- 12. Low carbon economy**

An economy based on low carbon power sources that has a minimal output of greenhouse gas emissions.
- 13. Megawatt (MW)**

A unit of electricity equal to one million watts, particularly used as a measure of the output of a power station.
- 14. National Electricity Market (NEM)**

The Australian wholesale electricity market that covers the electrically connected states and territories of eastern and southern Australia, and the associated synchronous electricity transmission grid.
- 15. Operational emissions (as opposed to embedded emissions / energy)**

The emissions of carbon dioxide during the operational or in-use phase of a building.
- 16. Precinct**

A specified area in a town that is designed or reserved for a common purpose, such as industry or recreation.
- 17. Regions Adapt Initiative**

A new global commitment to support and report efforts on adaptation at the state and regional level.
- 18. Renewable energy**

Energy that comes from resources which are naturally replenished on a human timescale such as sunlight, wind, rain, tides, waves, and geothermal heat.

19. Renewable energy target

A policy which seeks to increase the amount of electricity generated from renewable energy sources such as solar, wind, wave and geothermal.

20. Sector agreement

Agreement between the Minister for Climate Change and a particular person, entity, industry or business group on a voluntary basis for the purpose of recognising, promoting or facilitating strategies to meet any target set under the Climate Change and Greenhouse Emissions Reduction Act 2007.

21. Stationary energy

Includes emissions from electricity generation, fuels consumed in the manufacturing, construction and commercial sectors and domestic heating.

22. Under2MOU

The subnational Global Climate Leadership Memorandum of Understanding is known as the Under 2 MOU in reference to the goal of limiting warming to below 2°C, which Intergovernmental Panel on Climate Change (IPCC) scientists say is needed to avoid dangerous climate change and the MOU's shared goal of limiting greenhouse gas emissions to 2 tonnes per capita, or 80-95% below 1990 levels by 2050.





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