



City of Charles Sturt

Community Emissions Reduction Project

Community Summary Report

D Squared Consulting Pty Ltd
Trading as dsquared
ACN 159 612 067
ABN 38 159 612 067

Suite 5, 241 Pirie Street
Adelaide SA 5000
T: 0488 220 022

E: jacob@dsquaredconsulting.com.au
W: www.dsquaredconsulting.com.au

Project Number: 2634



Document Control

Issue	Date	Change	Checked	Approved
01	21/03/23	Draft issue for community engagement	DD	JP

Our vision is to think beyond the square.

Our Mission is to create spaces, places, and communities that are positive for both the environment and for people. We will do this by providing our clients with sustainable and bespoke solutions that are innovative, challenge perceived ideas, and push the boundaries of achievement and excellence.

We confirm that all work has been undertaken in accordance with our ISO 9001 accredited quality management system.

Acknowledgement of country

The dsquared team wish to acknowledge the Traditional Custodians of all country throughout Australia, and their cultural, spiritual, physical, and emotional connection with their land, waters, and community. We pay our respects to all Elders past, present, and emerging.

Community summary

The following provides a summary of the current community emissions profile, potential emission reduction actions, and emission projections to 2030 to enable the community to identify emission reduction initiatives and targets. The summary is intended to provide guidance and information so that the community can make an informed decision on what initiatives will be focused on and to support setting a community emissions reduction target for the City of Charles Sturt.

As part of developing a community emissions reduction target, it is important to understand the context from a regulatory and voluntary perspective. This will ensure that realistic actions and targets are set that work towards net zero emissions in a fair and equitable manner. All parts of the community have a role to play however the scale of impact and capacity to take action should be taken into account before making major commitments. Based on the below, a minimum 50% emissions reduction target is expected to be required to meet international and national commitments and work towards achieving the limits set in the Paris Agreement.

Commitments and legislation

The below outlines National and International legislation, commitments and trends that should be considered as part of setting a community emissions reduction target.



Paris Agreement: Hold global average temperature increases below 2 degrees and aim to limit to 1.5 degrees. To achieve the 2 degree pathway a 50% emissions reduction by 2030 and net zero emissions by 2050, or earlier, is required.



Greenhouse Gas Protocol – Global Protocol for Community-Scale Greenhouse Gas Emissions Inventory: The GHG Protocols were developed to provide a consistent set of guidelines on developing emissions inventories and reporting in a transparent manner. The GHG protocols are referenced by most voluntary carbon neutral standards including the Australian Government Climate Active Carbon Neutral Standards. The Community-Scale protocol has been developed specifically for cities and community emissions inventories and is used by C40 Cities for ongoing.



Australia: 43% emissions reduction by 2030 from 2005 and net zero by 2050. Legislated under the Climate Change Bill 2022 and committed to under the Paris Agreement via a Nationally Determined Contributions (NDCs) commitment.



C40 CITIES: C40 Cities is a global commitment of the largest 100 cities to drive urgent action on climate change and set ambitious emission reduction targets in line with a maximum 2 degree pathway. The C40 Cities have set a per capita city emissions target of 3.2tCO₂-e by 2030, approximately half of the current world average (6.4tCO₂-e), and >80% less than Australia's per capita average.



South Australia: 50% emissions reduction by 2030 and net zero by 2050 (goal), with a 60% emissions reduction from 1990 (legislated).

The South Australian Government is also developing a net zero program for government agencies, circular economy plans and strategies and driving emission reduction initiatives across its supply chain.



Science Based Targets Initiative: The Science Based Targets initiative (SBTi) has been developed to drive corporate action on climate change and reduce emissions and the process for setting a Science Based Target is directly applicable to councils and communities. The SBTi requires a target to be set for a minimum Scope 1 and 2 emissions, and Scope 3 is mandatory where it equates to over 40% of the emissions inventory. The Scope 1 and 2 emission reduction targets must be aligned with a 1.5 temperature increase pathway to achieve net zero emissions by 2050. Combined Scope 1, 2, and 3 targets must still be aligned with a 1.5 degree increase for Scope 1 and 2, however Scope 3 can be aligned with a 2 degree maximum increase.



City of Charles Sturt: Net zero corporate greenhouse emissions by the year 2023/24. Net Zero focusses on corporate GHG emissions within the Council's direct control. The Council also declared a Climate Emergency in December 2019.



Climate Active: The Climate Active program is administered by the Australian Government Department of Climate Change, Energy, the Environment and Water. It is recognised as one of the main certified pathways for demonstrating carbon neutrality and follows the Greenhouse Gas Protocols. Certifications include organisations, buildings, products, services, and events.

Current and projected emissions

Greenhouse gas (GHG) emissions have been increasing steadily and are expected to continue to increase without significant action to decarbonise both developed and developing economies. Based on current forecasts, even in the event global emissions were to peak in 2030, the world will overshoot the 2-degree pathway committed to under the Paris Agreement. This highlights that urgent action is required at all levels of government, private industry, and the community.

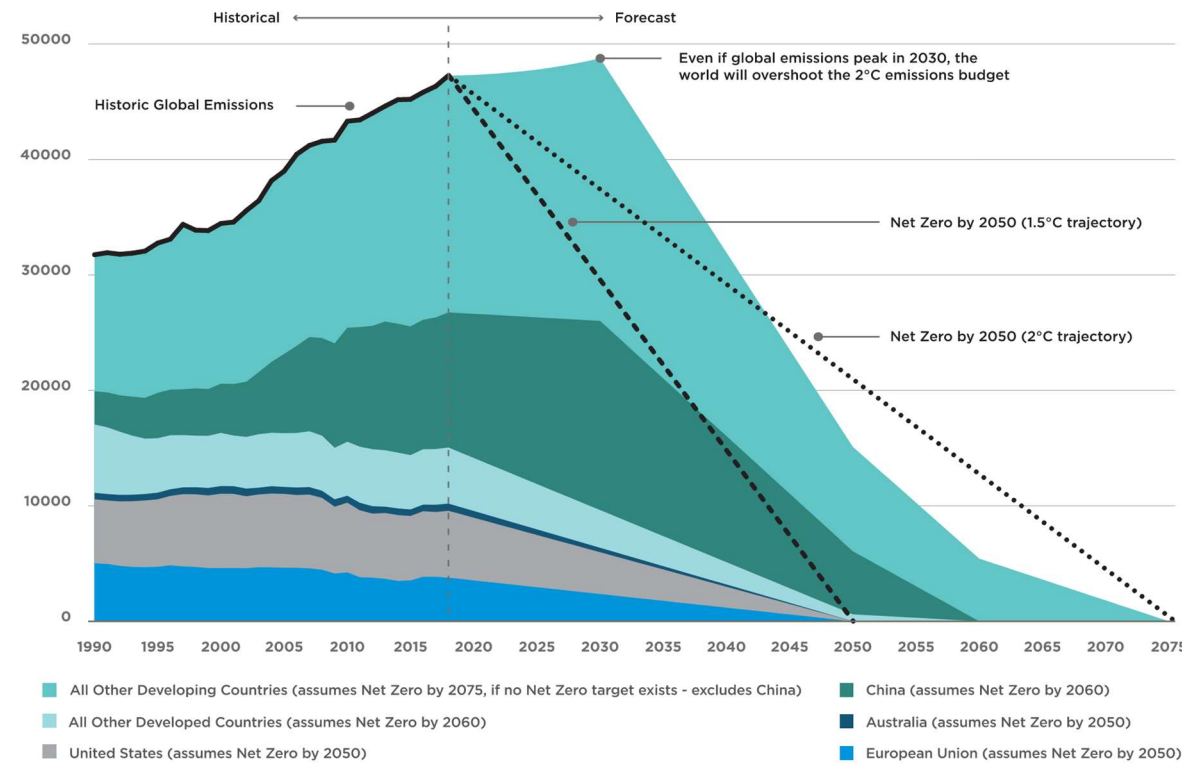


Figure 1: Global emissions projections

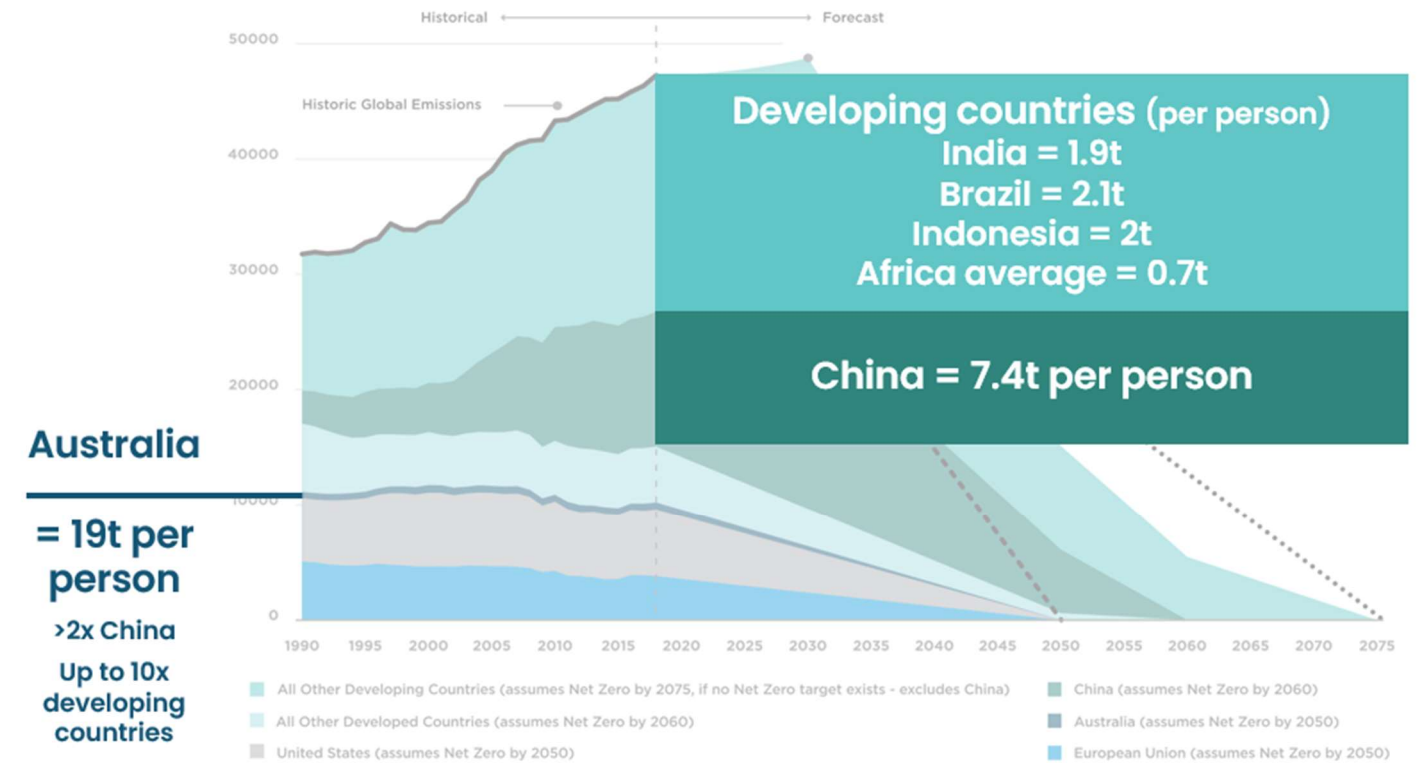


Figure 2: Global emissions compared to Australia

South Australia has been driving the net zero transition with a world leading share of renewable energy generation, best practice waste and resource management initiatives, and Councils driving net zero emissions and Climate Emergency Declarations. Emissions in South Australia have reduced by 31% compared to 2005, and 36% compared to 1990 (refer Figure 3), which has largely been due to increasing renewable energy generation (refer Figure 4), changes in Land Use, Land Use Change and Forestry (LULUCF) and reductions in livestock due to drought conditions. This highlights that although emissions are reducing, some of the reductions are not due to emission reduction initiatives (e.g. livestock levels will fluctuate depending on weather and drought conditions) and renewable energy generation is offsetting increases in other sectors such as transport and manufacturing.

Although total emissions have been reducing, they still equate to 14tCO₂-e per capital per annum which is well above the global average and is higher than most developed countries. As a result, continued action on emission reduction initiatives is required to work towards net zero emissions. The South Australian (SA) Government is developing a net zero program both for the state and for government agencies which is expected to outline a number of priority actions to reduce emissions in line with the 50% emission reduction target by 2030.

SA's average generation by fuel source in 2021

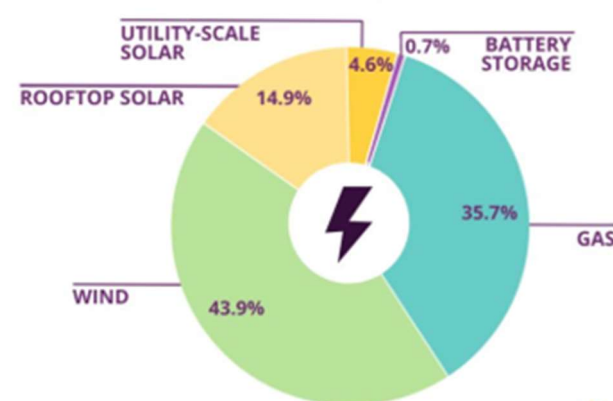


Figure 4: South Australia's renewable energy share

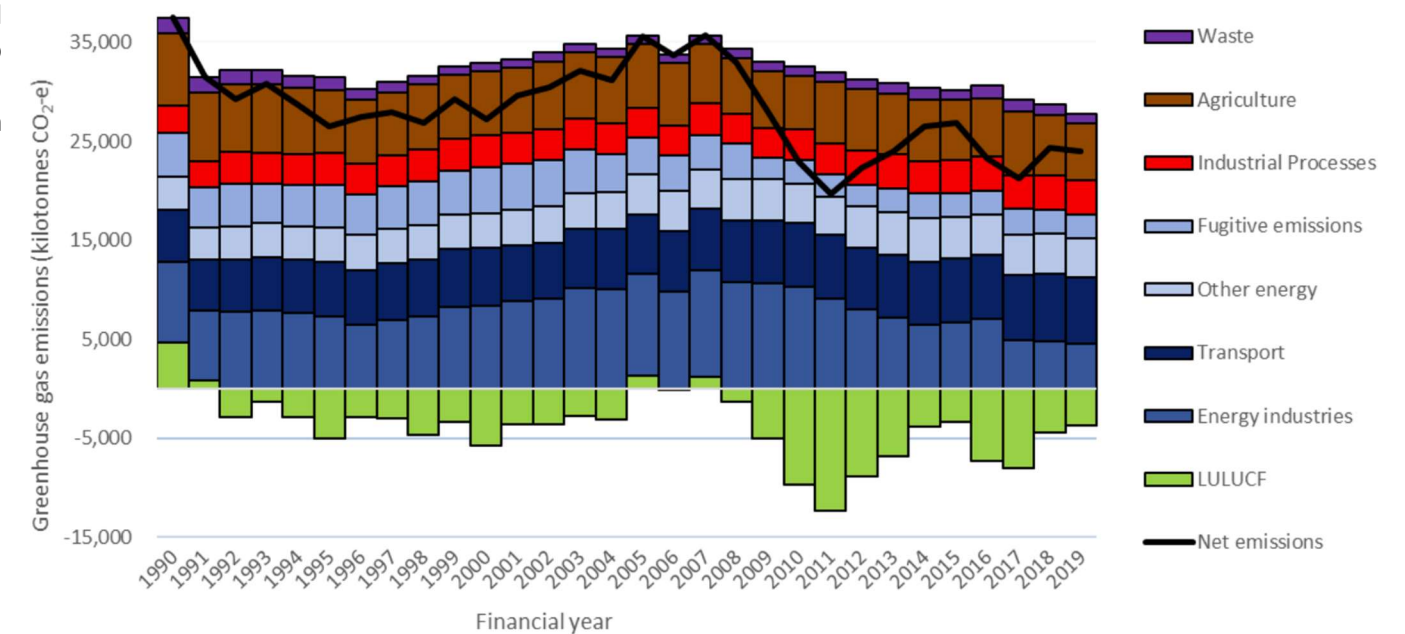
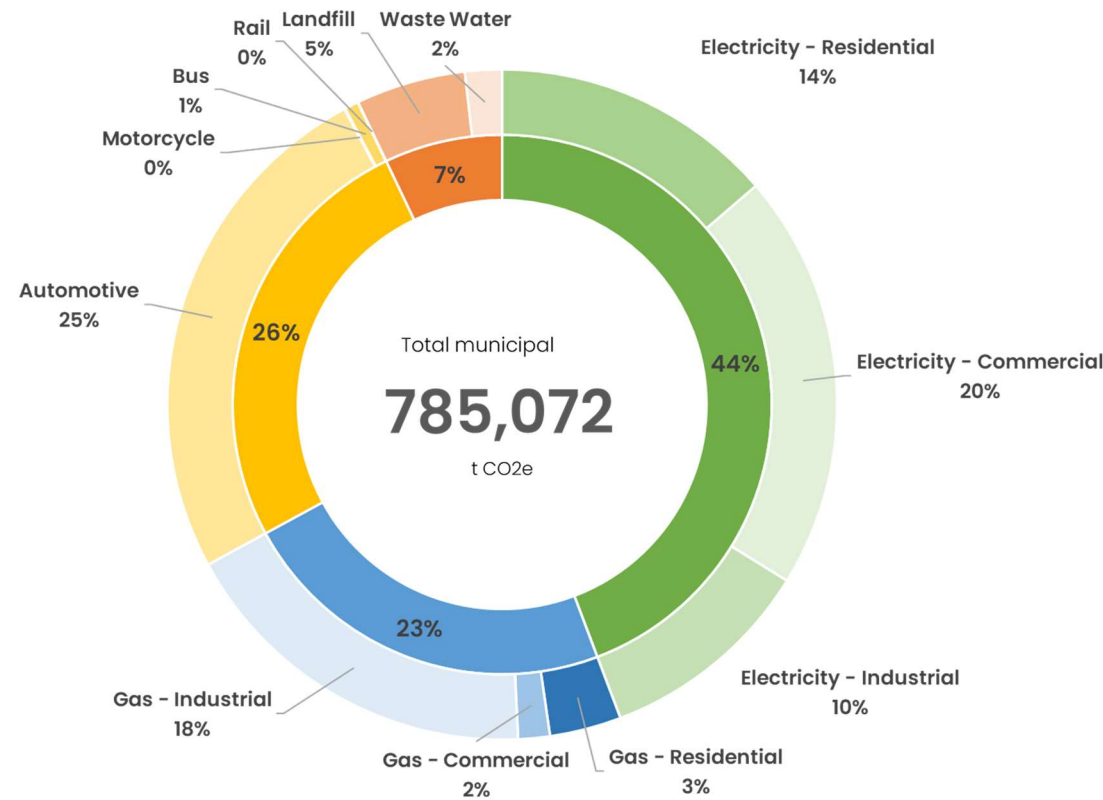


Figure 3: South Australia – Emissions 1990 to 2019

City of Charles Sturt community emissions

Based on the emissions analysis, community emissions are estimated to total 785,072 tCO₂-e in 2020/21 and have reduced by approximately 16% since 2018/19. An analysis of the 2029/30 emissions profile has also been undertaken based emissions reduction initiatives including electric vehicle (EV) uptake, renewable energy generation in South Australia, building performance improvements, all-electric buildings and reducing waste to landfill. Based on the projections, it is estimated that community emissions could reduce by approximately 47%, with a large amount of this reduction due to renewable energy generation in South Australia which is projected to reach up to 100% by 2030.

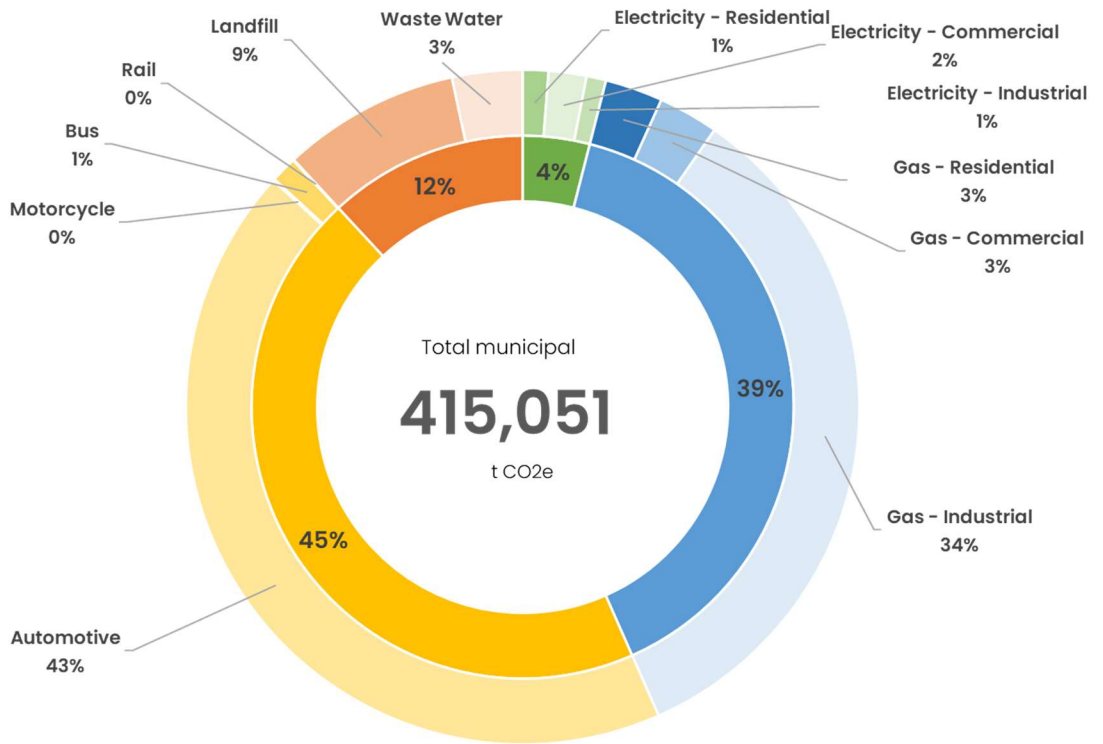
FY2021 Emissions Profile



Emissions estimate - dsquared

Source Emissions (t CO ₂ e)	2020/21	%
Electricity	347,455	44%
Transport	179,131	23%
Gas	202,886	26%
Waste	55,600	7%
Total	785,072	

FY2030 Emissions Projection




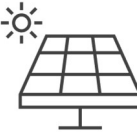

2029/30 emissions profile



Source Emissions (t CO ₂ e)	2029/30	%	Reduction	%
Electricity	16,551	4%	330,904	95%
Transport	185,633	45%	17,253	9%
Gas	163,506	39%	15,625	9%
Waste	49,360	12%	6,240	11%
Total	415,051		369,991	47%



An additional analysis has been undertaken based on increased community led action with a focus on driving, buying, and wasting less, while also increasing the shift to all-electric, renewable energy powered households and businesses. The projections have demonstrated that a 50% reduction can be achieved based on currently available technologies and emission reduction initiatives, with support provided by existing grants and incentives. It is therefore recommended that a minimum 50% emissions reduction is set to work towards net zero emissions.

Emission reduction initiatives and targets

To assist in driving community emission reduction outcomes, the following provides a summary of the key initiatives that the community plan could incorporate including the emissions reduction potential and recommended targets.

Topic	Summary	2030 Emission reduction targets	
		Minimum target:	Stretch target:
 Buildings	<p>Electricity and gas use in residential and commercial buildings represent approximately 40% of total emissions in 2020/21. With electricity emissions reducing due to renewable energy generation, getting off gas is the next priority for emissions, along with improving building performance and energy efficiency which can also reduce costs and improve indoor comfort.</p> <p>Energy efficiency: Improve energy efficiency by installing shading, insulation and double glazing, replace old appliances and hot water systems, and switch from gas to electric which is more efficient.</p> <p>Getting off gas: Replace gas powered heaters, hot water and cooktops and disconnect from the gas network to remove the use of a fossil fuel, improve indoor air quality, and reduce costs by integrating with onsite solar PV systems. This could start with a pilot such as a street committing to get off gas, or an entire suburb which a suburb in the City of Wollongong is working towards.</p> <p>Adapt West: Continue to promote and use Adapt West resources and tools, including the My Cool Home toolkit which supports residents in improving energy efficiency and comfort at home.</p>	<p>9% gas emissions reduction</p> <p>2% total emissions reduction</p>	<p>A stretch target is not recommended as this will require a significant shift from gas to all-electric which is unlikely and will have implications for the electricity grid if not planned for effectively.</p> <p>Getting off gas should be coordinated with the installation of solar PV systems and smart controls where possible.</p>
 Renewable energy	<p>Increasing renewable energy generation in South Australia is projected to reduce electricity emissions by 95% by 2030. Therefore, supporting renewable energy uptake and communicating the benefits to residents and businesses should be the focus. This can also be used to celebrate living in South Australia and being powered by renewables.</p> <p>Rooftop solar PV: It is recommended that the Council provide guidance and information on installing solar PV and tracks rooftop solar PV share in the council area. Residents and businesses are encouraged to install solar PV to reduce emissions and costs. This includes opportunities such as Virtual Power Plants (VPP) which the City of Mitcham are currently supporting via their Community Renewables Program.</p> <p>Renewable energy agreements: To continue to support renewable energy projects across Australia and South Australia encourage residents and businesses to purchase Green Power in line with the Council's electricity agreement which has procured 100% accredited renewable energy to reduce emissions.</p>	<p>95% electricity emissions reduction</p> <p>>40% total emissions reduction</p>	<p>A stretch target is not recommended due to the renewable energy share in South Australia, however, to support renewables and the all-electric transition, a rooftop solar PV target is recommended.</p> <p>>40% small-scale rooftop solar</p>
 Transport	<p>Simple changes in travel habits can have a large impact on emissions including walking, riding and catching public transport. Transitioning to electric vehicles will also take advantage of South Australia's renewable energy generation, reduce emissions and improve air quality.</p> <p>Drive less: Walking and riding, catching public transport, and car sharing just one day per week is a significant opportunity to reduce transport emissions while also being cheaper and less stressful than driving in peak hour traffic. The emissions, health and wellbeing benefits of driving less should be celebrated and supported.</p> <p>Hybrid and electric vehicles: Supporting increased awareness and uptake of hybrid and electric vehicles will result in meaningful reductions in emissions. Established brands of hybrid vehicles can be 20–30% more efficient than their equivalent petrol models, with EVs reducing emissions by 50–70% and up to 100% by 2030.</p>	<p>9% transport emissions reduction</p> <p>2–3% total emissions reduction</p>	<p>It is recommended that a stretch target is set to transition to hybrid and electric vehicles and support walking and riding as part of daily commutes.</p> <p>11% transport emissions reduction</p> <p>3–4% total emissions reduction</p>

Topic	Summary	2030 Emission reduction targets	
		Minimum target:	Stretch target:
<div>  <div>Waste</div> </div>	<p>Increasing organic waste diversion, changing food shopping habits and diet, while reducing contamination are key opportunities for reducing waste to landfill and methane emissions.</p> <p>Organics and green waste diversion: A continued focus should be placed on organic waste diversion, with benefits for both residents and the Council. Opportunities include continued rollout / uptake of kitchen caddies and information on home composting.</p> <p>Contamination: It is recommended that the Council continue to provide education and information to residents and businesses, including the financial impact of waste contamination which impacts rates. For example, if achieved, the \$1m annual saving possible by diverting all organics and garden waste could be reinvested into community grant programs to reduce emissions.</p> <p>Shopping and diet: Planning meals and shopping can reduce food waste upfront, removing the need for placing waste in any of the Council kerbside bins. It is recommended residents are supported with resources and guides on buying local and planning for meals.</p>	<p>9% waste emissions reduction</p> <p>1% total emissions reduction</p>	<p>Increasing waste diversion and reducing contamination are easy steps which can be achieved with existing programs and services.</p> <p>15–20% waste emissions reduction</p> <p>3% total emissions reduction</p>
<div>  <div>Supporting actions</div> </div>	<p>In addition to the community emissions capture in this report, it is recommended that the following initiatives are supported to reduce emissions and address supply chain emissions and global and national emission reduction initiatives and targets.</p> <p>Fashion: Fast fashion is a major contributor to emissions and waste to landfill, with environmental impacts across the manufacturing and supply chain. Consider buying from sustainable and ethical fashion labels that are transparent and upfront about their environmental impacts.</p> <p>Recycle clothes and buy second hand: Recycling unused, lightly worn or clothes that no longer fit with local charities and community groups. Buy second-hand clothes to close the loop.</p> <p>Buy less and buy quality: Buying higher quality gadgets and technology that lasts longer should be a focus, while also choosing products that can be repaired and have spare parts to extend the life of products.</p> <p>Grow your own food: Growing food at home, in the community (community gardens and verges with approval), and as part of the hospitality sector connects people with food and nature and reduces food miles.</p> <p>Plant trees and vegetation: Each additional tree planted will sequester carbon, provide habitat, and provide cooler outdoor environments. Residents and businesses should be encouraged to plant trees in line with the Council's greening strategy with the Verges Alive program an excellent example.</p> <p>Join sustainability groups: Environment and sustainability groups connect residents and businesses with like-minded individuals, connect people with natures and the outdoors and supports people in finding out information on ways they can reduce their environmental impacts and emissions. The Council should continue its support for community groups and events that aim to enable climate action and support sustainability outcomes.</p> <p>Grants and funding: A number of grants and incentives are provided for residents and businesses and information should be shared with the community on how to access funding to improve energy efficiency and reduce emissions.</p>		

Topic	Summary	2030 Emission reduction targets	
		Minimum target:	Stretch target:
<div>  <div> <div>Council supporting actions</div> </div> </div>	<p>Lead by example: The Council should continue actively working towards Net Zero for their corporate operations and develop case studies of actions the Council has implemented which households and businesses could learn from e.g. Ngutungka Henley will be an all-electric building, with heat pumps and induction cooktops powered by onsite renewable energy, and is integrating a range of sustainability initiatives that could be replicated. Information and tours of the facility should focus on the sustainability credentials and initiatives in the building.</p>		
	<p>Events and community groups: Consider integrating sustainability messaging across Council services and at community facilities, such as signage and highlighting the actions Council are already taking. Dedicated sustainability events with residents and businesses could also be run, however this can have the same people attending each time and doesn't necessarily reach a wide audience.</p>		
	<p>Building performance and renewables advice: Community consultation identified that residents and businesses didn't know where to start, what the priorities were and how they could meaningfully reduce emissions. The community guides developed as part of this project should be used to assist in sharing information and knowledge across the Council and at community events.</p>		
	<p>EV charging stations and awareness: It is recommended the Council continue to look for opportunities to increase the number of EV charging stations across the council area and increasing awareness of the benefits of EVs and low emissions vehicles.</p>		
	<p>Grant and incentives: It is recommended that the Council consider sustainability grants and incentives, similar to the City of Adelaide Sustainability Incentives Schemeⁱ, to support residents and businesses in reducing emissions and costs. However, there are also many other grant programs at a state and federal level which residents and business can access which should be promoted.</p>		
<div>  <div>Monitoring</div> </div>	<p>Ongoing monitoring: The Snapshot Climate Tool provides an easy-to-use monitoring platform and based on undertaking a review of the system, provides an effective tool for monitoring emission over time without requiring detailed, and costly, analyses. It is recommended that the community and Council use this service for ongoing monitoring and undertake more detailed case studies for specific emission reduction actions if more granular data is required.</p>		

Based on the above initiatives and emissions reduction projections, it is recommended the following emission reduction targets are considered as part of developing the community emissions reduction plan. These targets will work towards the net zero emissions transition while also reducing impacts on the environment and improving the health and wellbeing of the community.

Recommended emissions reduction target	Minimum target:	Stretch target:
	<p>>50% emissions reduction compared to 2020/21</p> <p>The projected emissions reduction (47%) should be exceeded, and the community target should meet the minimum SA Government state-wide goal. If a 2018/19 baseline is set, a 56% reduction is possible.</p>	<p>>60% emissions reduction compared to 2020/21</p> <p>A stretch target should be used to drive residents and businesses in working together to reduce emissions while still being realistic. This some target could also be suitable compared to 2018/19, however a higher stretch target is recommended e.g. 65–70%.</p>

Community guides

The following information guides have been developed to support households and businesses in implementing emission reduction initiatives and work towards net zero emissions.

Emissions Reduction Fact Sheet – Climate Change

Global climate change is affecting all facets of life and can lead to an increase in the frequency and intensity of natural disasters such as bushfire, flooding and extreme heat. These events can detrimentally affect our built environment and the reliability of infrastructure, potentially leading to displacement and poverty, impacts to our health and wellbeing, and damages to our natural environment.

1. The Greenhouse Effect

Earth's atmosphere contains greenhouse gases (GHG's), such as carbon dioxide, methane and water vapour, that act like a blanket around the planet, trapping heat close to the Earth's surface. When the sun shines, our atmosphere captures the sun's energy to keep the planet warm. This process is known as the Greenhouse Effect.

Some of these GHG's are naturally occurring, in perfect balance to support our natural ecosystems and planet's biological cycles. However, since the 1800s and onset of the Industrial Revolution, the accumulation of greenhouse gases in the atmosphere has rapidly increased.

Additional GHGs continue to warm the planet, disrupting natural process and cycles, which cause natural disasters and extinction of animals and plants. This in turn impacts food production and universal access to clean water, leading to poverty and displacement and impacting health and wellbeing.

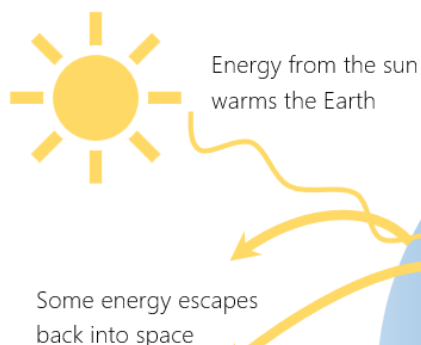
2. Activities and Emissions

Elements of our climate naturally vary over decades, but today we are experiencing unprecedented rapid warming caused by human activities. This is primarily caused by the burning of fossil fuels, such as coal, oil and gas that generate GHGs.

For example, using gas and oil for transport and heating buildings, or burning coal to generate electricity. Landfills and agriculture are also major sources of methane emissions, activities which have significantly expanded with industrialisation.

Trees and oceans naturally sequester carbon from the atmosphere. Clearing land for development and agriculture therefore contributes to an increased accumulation of GHG emissions. As oceans sequester carbon, sea temperature increases, resulting in loss of sea life and the melting of polar ice caps, which contribute to rising sea levels that flood and submerge low-lying land areas.

Greenhouse Effect



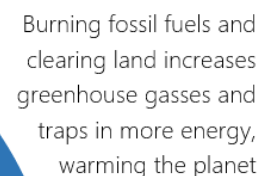
Energy from the sun warms the Earth

Some energy escapes back into space

The diagram shows a sun on the left emitting yellow wavy arrows representing solar energy. One arrow points to the Earth, which is depicted as a blue and white globe. Another arrow points away from the Earth towards the left, representing energy escaping into space.

Energy is retained by greenhouse gases in the atmosphere

Enhanced Greenhouse Effect



Burning fossil fuels and clearing land increases greenhouse gases and traps in more energy, warming the planet

The diagram shows a globe with a red arrow pointing from the sun to the Earth, and a red arrow pointing from the Earth back to the sun, indicating that more energy is being trapped. Below the globe, there are silhouettes of a car, a bus, and people walking and cycling, representing human activities that contribute to greenhouse gas emissions.

3. Global GHG Concentrations

Concentrations of all the major long-lived greenhouse gases in the atmosphere continue to increase, reaching 516 ppm (CO₂-e) in 2021, the highest levels on Earth in at least two million years.

4. Australia's Climate

Australia's climate has warmed on average by 1.47 degrees Celsius since national records began in 1910, leading to increased dangerous fire weather days and subsequent bushfires. Winter rainfall has been declining in the Southern parts of Australia by up to 19 percent since the 1970s, however the intensity of extreme rainfall events has increased by around 10 per cent or more in recent decades, particularly in the Northern parts of the country.

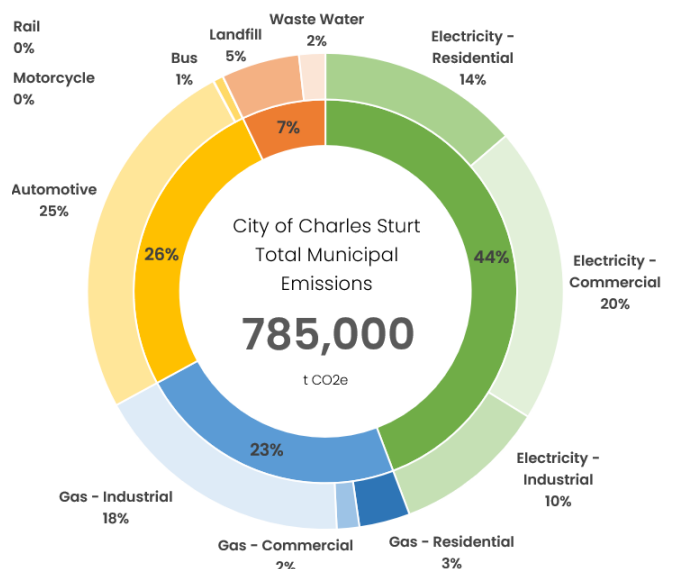
5. Australia's Achievements

Since 2009, Australia has decarbonised its economy by an average of 12 MtCO₂-e per year. In 2022 the Australian Government increased its commitment under the COP21 Paris Agreement to reduce emissions by 43% below 2005 levels, as well as committing to the goal of achieving net zero emissions by 2050, enshrined in the Climate Change Act 2022. More than 73 countries and over 175 of the world's largest private companies have committed to net zero emissions by 2050. Australia has also signed the Global Methane Pledge to collectively reduce global methane emissions by 30% by 2030.

6. City of Charles Sturt Emissions Profile

The majority of emissions within CCS are associated with electricity and gas consumption and passenger vehicles, estimated at 6.4tCO₂-e per person annually.

As a result of the decarbonising of the electricity grid already underway, through expansion of renewable energy and green hydrogen and transition away from gas, CCS emissions are predicted to decline. Further reduction in waste to landfill and switching to sustainable transport options (e.g., EVs, cycling) has the potential to reduce council wide emissions by 47% by 2030, from 785,000 to 415,000tCO₂-e annually, or 3.4tCO₂-e per person per year.



More Resources

CSIRO State of the Climate 2022

<https://www.csiro.au/en/research/environmental-impacts/climate-change/state-of-the-climate>

Climate Council

<https://www.climatecouncil.org.au/>

Refer to the series of Emissions Reduction Fact Sheets by CCS for actions the community can take to contribute to a positive climate impact.

Potential 2030 Targets

- Transition to 100% renewable electricity
- Reduce waste to landfill emissions by 15-30%
- Reduce transport emissions by 20%
- Reduce household gas connections to 25%



Emissions Reduction Fact Sheet - Buildings

Homes and businesses contribute to approximately 40% of emissions within the City of Charles Sturt, associated with gas and electricity consumption. Residents and business owners can have a meaningful impact on community emissions reduction through the following key initiatives:

1. Improving energy efficiency of the building

The walls, floors and roof provide an important barrier to restricting undesirable outside temperatures into buildings, reducing the need for heating and cooling, and in turn improving the efficiency of air conditioning and heating while running.

Draught Sealing

Providing weather seals to external doors and windows, such as sweep seals and adhesive foam, and sealing up gaps and cracks in the building's construction with caulking will limit unintentional air movement, which can cause up to 25% of winter heat loss.

Insulation

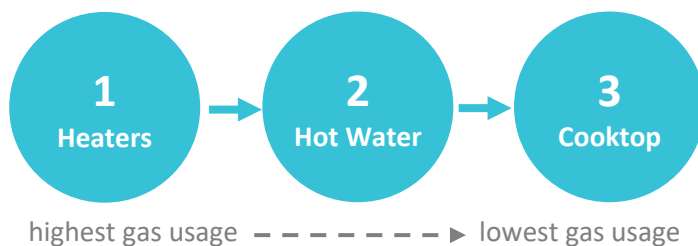
Insulation will restrict temperature movement and should be installed in all ceilings, external walls and floors, wherever access allows and to the highest level (R-Value) possible to maximise impact. Old insulation may no longer be effective and may need to be replaced.

Windows and Shading

Installing external shading such as blinds and awnings to windows can reduce summer heat gain, while replacing old windows with double glazing will improve the comfort and efficiency of the building all year round.

2. Transitioning gas appliances and services to all-electric alternatives

Extracting and burning gas creates greenhouse gases that contribute to climate change. Gas is a fossil fuel, in which the main component is methane, a greenhouse gas nearly 100 times more potent than carbon dioxide in the short term. Transitioning homes and businesses to all-electric operation, divesting from gas infrastructure, will reduce emissions and also allow for 100% renewable energy operation. Space heaters and hot water services will have the largest impact on emissions reduction, whilst also reducing energy consumption and running costs.



Space Heating

Gas space heaters pose health risks if not properly flued and are inefficient forms of heating. These can be replaced by electric reverse cycle ducted or wall mount (split) systems.

Low-Cost Quick Wins

- Retrofit ceiling insulation, R4.0 or higher
- Install external shading on windows
- Install ceiling fans
- Provide draught sealing on doors, windows and caulk gaps in construction
- Install water efficient taps and showerheads (high WELS ratings)





Hot Water Service

Water heating can be swapped for efficient electric heat pump or solar electric boosted systems. Heat pump systems are roughly three times more efficient than conventional electric resistance systems and even more efficient than gas instantaneous systems.

Cooking

Gas cooking is often the last barrier to complete electrification however induction cooking is more than twice as energy efficient as gas, is safer, and mitigates health impacts, such as asthma, associated with gas appliances.

EXAMPLE: Replace inefficient electric resistance or gas hot water service with high efficiency electric heat pump.

Cost: \$4,000 - \$6,000 (depending on system quality, current set up, i.e. disconnection of gas infrastructure)

Emissions Reduction: Approx. 0.36t CO₂-e per annum per household. Up to 9,925t CO₂-e per annum for the entire council area should all homes and businesses make the switch.



More Resources

Your Home – Australia's Guide to Environmentally Sustainable Homes

<https://www.yourhome.gov.au/>

Rewiring Australia

<https://www.rewiringaustralia.org/>

Sustainable House Day

<https://sustainablehouseday.com/>

SA Government Energy Advisory Service

<https://www.sa.gov.au/topics/energy-and-environment/energy-advice-and-education/energy-advisory-service>

Renew E-Books on Sustainable Living

<https://renew.org.au/what-we-do/publications/>

Energy Rating / Water Rating

<https://www.energyrating.gov.au/>

<https://www.waterrating.gov.au/>

My Cool Home – Adapt West

<https://www.adaptwest.com.au/my-cool-home>

Make the Switch

<https://maketheswitch.org.au/how-to-switch/>

Canstar Blue – Energy Connection & Disconnection Fee Explained

<https://www.canstarblue.com.au/gas/connection-disconnection-charges/#disconnection>

Nationwide House Energy Rating Scheme (NatHERS)

<https://www.nathers.gov.au/>



Emissions Reduction Fact Sheet – Renewable Energy

Australia has amongst the highest residential solar uptake in the world on a per capita basis, with over 1.7 million homes having installed solar PV. The proportion of households within the City of Charles Sturt with rooftop solar is 37.2%, equating to 81MW of generation capacity, which is just short of the South Australian average of 41%.

With solar panel efficiency increasing and prices on the way down (since 2008 the cost of solar PV has dropped by 80%), installing solar is an important way of reducing emissions, energy bills and future proofing a home. Battery storage systems can also be installed to make best use of generated solar energy, limiting export to the grid.

1. Solar PV

A Clean Energy Council Approved Solar Retailer (see resources section) can provide the best advice on a suitable system for the location, roof, overshadowing, house size and energy consumption, and provide a certified contractor for installation. Where panel shading is an issue, systems that include microinverters or power optimisers can offer improved solar generation.

Setting timers on appliances (i.e. washing machines and hot water systems) to run during the day when solar energy is generated will make best use of the system. Unused energy will be exported to the grid, but export is also limited by SA Power Networks to manage grid stability, and Feed-in Tariffs are low (approximately 10 cents per kWh compared to 30-50 cents per kWh to purchase electricity from the grid).

In order to balance a home's predicted energy use over the year, indicative solar PV system sizing based on the area of the home is provided below.

Home Size	PV System Size (kWe peak)
Up to 150 m ²	5.5
150 m ² - 250 m ²	7.5
250 m ² - 350 m ²	10

2. Battery Systems

Battery storage systems are also an option to make best use of generated solar energy, limiting export to the grid. Assess the homes energy needs before investing in a battery system and consider the financial impact. Homes and businesses that consume energy mostly during daytime hours or have limited ability to generate solar energy due to shading or space restrictions, may have reduced benefit from a battery system. Batteries are rapidly decreasing in cost, even faster than Solar PV over the last decade.

3. GreenPower

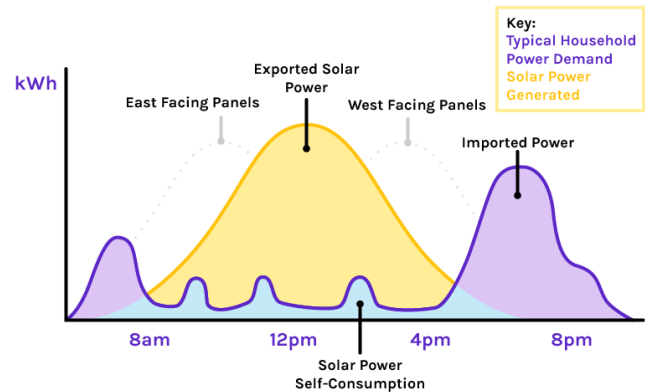
An alternative option in sourcing renewable energy may be to purchase GreenPower through the electricity retailer. GreenPower is renewable energy from government accredited sources. Almost all electricity retailers in Australia have a GreenPower Accredited product that lets you purchase between 10 and 100% of your electricity from a renewable source. The scheme supports the grid transition to renewable energy, with the cost of GreenPower invested into renewable energy projects within Australia.



4. Smart Plugs and Meters

Utilising smart meters or smart plugs allows homeowners and business owners to take control of their energy consumption by providing greater transparency on peak times of electricity use and identifying high energy use appliances. Some options also allow for Solar PV generation to be integrated, as well as controlling renewable energy export to the grid and appliance time-of-use against energy tariffs, to reduce energy bills and make best use of solar energy generated, whilst reducing emissions.

SOLAR POWER SELF-CONSUMPTION



EXAMPLE: Installation of rooftop 8kW solar PV

Upfront Cost: \$8,000 after rebates (approximately \$1000-\$1200 per kW is expected for a quality system)

Ongoing Cost Saving: Potential \$2,000 saving on annual electricity bills, where annual bills are \$2,500 per year charged at 36 cents/kWh and 80% generated energy is exported to the grid at 10 cents/kWh (dependent on system efficiency)

Emissions Reduction: Up to 1.8t CO₂-e per annum per household and 49,000t CO₂-e per annum for the entire council area.



More Resources

Clean Energy Council Approved Solar Retailer

<https://www.cleanenergycouncil.org.au/consumers/buying-solar/find-an-approved-solar-retailer>

Solar Quotes

<https://www.solarquotes.com.au/>

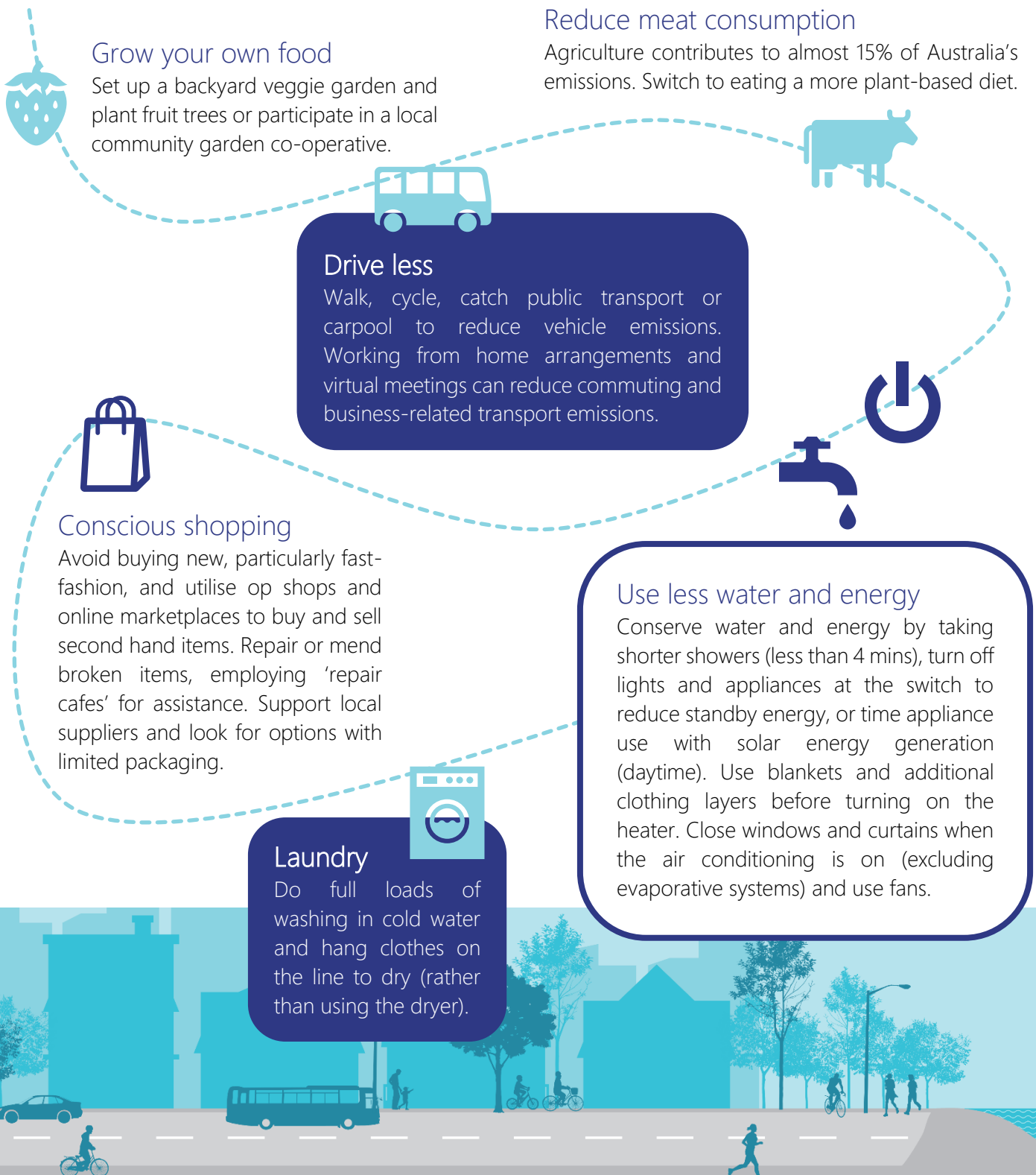
Low-Cost Quick Wins

- Switch to GreenPower as part of your energy contract
- Use smart plugs to track energy consumption of major appliances and control usage to daylight (solar generating) hours



Emissions Reduction Fact Sheet – Sustainable Living

Residents and Businesses can support emissions reduction through small day-to-day changes by the following sustainable living initiatives:



Recycle and compost

Correctly separate waste items for recycling and green waste, particularly food waste using a kitchen caddy. Take harder-to-recycle items such as e-waste, batteries and soft plastics to local drop off locations.



Money and investment

Consider what institutions control your finances and where they invest the money. Choose banks and superannuation funds that invest in renewable energy rather than the fossil fuel industry.



Air travel

Avoid unnecessary air travel, conduct virtual business meetings and holiday locally. Choose non-stop flights where possible, as most emissions are released in take-off and landing. Carbon offset flights.



Plant trees and vegetation

Greening our urban community will reduce urban heat island effects and remove carbon from our atmosphere.



Carbon Neutral Services

Use consumer power to choose carbon neutral companies, e.g. energy retailer, telecommunications.

Take Action

Email your local MP, continue to have conversations about climate change and emission reduction, and join or volunteer in community organisations, e.g. political activist groups or tree planting events.



More Resources

Sustainable Living Guide

<https://www.sustainablelivingguide.com.au/>

Which Bin SA

<https://www.whichbin.sa.gov.au/>

My Cool Home – Adapt West

<https://www.adaptwest.com.au/my-cool-home>

Adelaide Sustainability Centre

<https://www.adelaidesustainabilitycentre.org.au/>

Sustainable West

<https://www.sustainablecommunitiessa.org.au/projects/sustainable-west/>

Greenpeace Green Electricity guide

<https://www.greenelectricityguide.org.au/>





Emissions Reduction Fact Sheet – Transport

Automotive emissions account for almost 40% of all community emissions within the City of Charles Sturt and private vehicle use accounts for 97% of those emissions, with the remainder attributed to public transport (rail and bus) and motorcycles. Residents and businesses can have a significant impact on emissions reduction by reconsidering the way they travel from place to place with the following initiatives:

1. Walking and Cycling

Utilising the network of footpaths and bike lanes, including the Linear Park Trail alongside the River Torrens, for commuting to work and getting around will have health and wellbeing benefits, alongside zero fuel and maintenance costs and zero emissions.

2. Electric Vehicles

Transiting combustion vehicles to electric options will drastically reduce emissions associated with transport. Electric vehicles attract a 50-70% emission reduction when charged from the grid and up to 100% when charged from rooftop solar PV. EVs are predicted to be the same price as their petrol counterparts in 2026, and 20% cheaper by 2030. As Governments work towards Net Zero goals, rebates and green loan schemes are likely to incentivise the transition.

EVs also cost far less in fuel and maintenance and there are more than 140 charging sites across South Australia, including 6 JOLT EV charging sites along Port Road, offering free charging for the first 7kWh (15mins or around 45km range) every day. JOLT chargers are powered by 100% renewable energy.

3. Low Emission Vehicles

Hybrid electric vehicles attract 20-30% emissions reduction compared to an equivalent vehicle. The type of vehicle also has an impact, for example the Toyota Corolla produces 65% less emissions than the Toyota Hilux per km. The Green Vehicle Guide (see resources section) is an Australian Government Initiative that provides emissions and cost comparison on vehicles to assist buyers in selecting sustainable transport options.

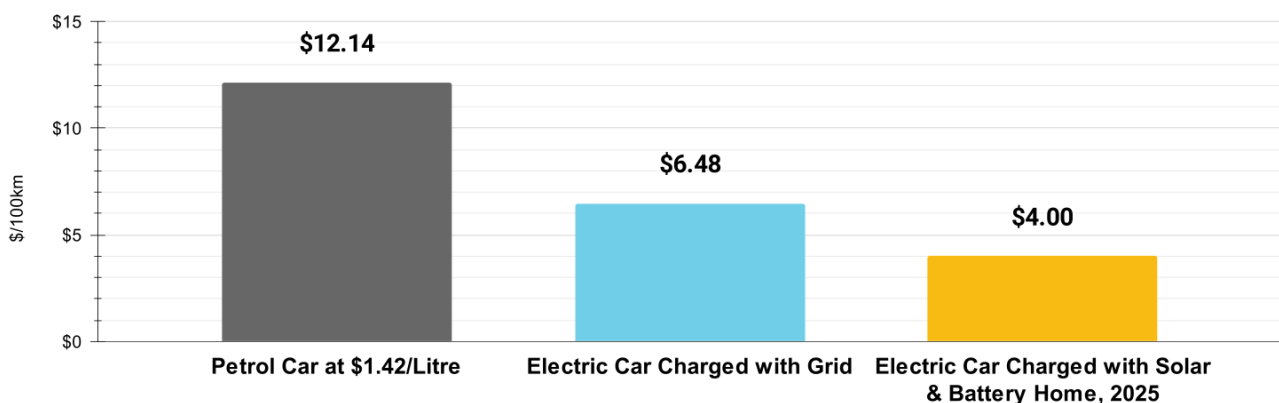
4. Public Transport

Moving people around 'en masse' is efficient and attracts a 40-50% emissions reduction compared to private vehicle transport. Emissions reduction is increased when more people utilise public transport and trials are underway in Adelaide for hybrid and fully electric buses.

5. E-Bikes and E-Scooters

For journey's that a too long to walk or cycle, assisted E-bikes or E-scooters could be used, which have very low emissions.

Cost Per 100km - Electric Vehicle versus Petrol Vehicle - Mid-Size Car





6. Smart working

Businesses can consider smart ways of working to reduce emissions associated with transport. Implementing 'working from home' policies and encouraging carpooling or providing incentives to use public transport, walking and cycling to work, can reduce emissions associated with commuting each day. Upgrading company fleet vehicles to electric options or conducting meetings and interactions online or over the phone, rather than in-person, will reduce emissions associated with business activity.

Low-Cost Quick Wins

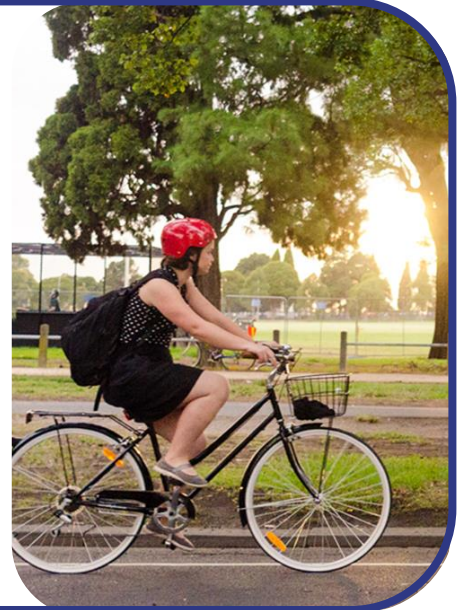
- Walk or cycle
- Catch public transport
- Use E-Scooters or E-Bikes
- Carpooling
- Implement 'working from home' policies
- Conduct business activities online or over the phone

EXAMPLE: Daily commute to Adelaide CBD from City of Charles Sturt, based on average 16km journey. (Semaphore Park to Victoria Square)

Cycling: 50 minutes, Zero emissions. Faster with an E-Bike and only 48g of CO₂-e emissions. Potential to reduce emissions by 1.5tonnes CO₂-e per person annually.

Bus: 55-65 minutes, 1,500g CO₂-e emissions. Potential to reduce emissions by more than 0.75tonnes CO₂-e per person annually.

Private Car: Up to 45minutes (impacted by traffic congestion). Average SUV (45% of new vehicle car sales) 3,200g CO₂-e emissions. Potential to reduce emissions by 1.5tonnes CO₂-e per person annually switching to fully electric vehicle charged with rooftop solar.



More Resources

Rewiring Australia
<https://www.rewiringaustralia.org/>

RAA EV Charging Network
<https://www.raa.com.au/motor/motoring-services/ev-charging-network>

Green Vehicle Guide
<https://www.greenvehicleguide.gov.au/>

Chargefox / JOLT
<https://www.chargefox.com/>
<https://jolt.com.au/>





Emissions Reduction Fact Sheet – Circular Economy

Waste to landfill accounts for only 5% of emissions within the City of Charles Sturt community, however further emissions are generated upstream through the extraction of raw materials (mining), manufacturing new products and transporting these to the community. In addition, recycling processes also generate emissions. Understanding that materials and resources are finite, and some will never breakdown in the environment, encourages the global trend towards a 'Circular Economy'. This concept is in contrast to the current linear model of 'take-make-dispose' and encourages the community to reduce and avoid consumption in the first instance.

Residents and Businesses can support the transition to a Circular Economy, reducing waste and wider emissions associated with the consumption of materials, through the following initiatives:

1. Reduce

Avoid overconsumption and purchasing new items. Re-evaluate what you really 'need' and what you can do without. Purchase items with minimal packaging to avoid waste.

2. Reuse

Appreciate the material value in items that already exist and look for ways to retain this value by reusing and repurposing products before disposing in landfill or purchasing new.

Online 'buy, swap, sell' Marketplaces

Utilise online marketplaces such as Gumtree and Facebook to purchase and sell items second-hand.

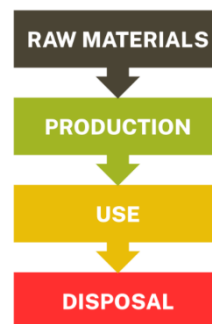
Local 'Buy Nothing' groups

Join a local 'buy nothing' group to share or gift items.

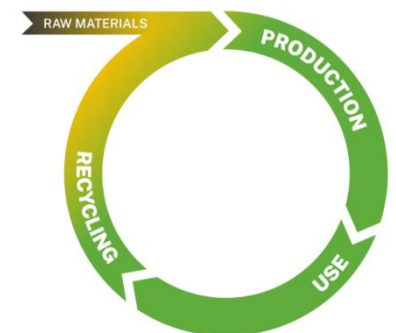
Op Shops and Second-Hand Stores

Buy and donate items through second-hand shops, supporting the community through charity.

LINEAR MODEL



CIRCULAR MODEL



3. Repair

Give broken products a second life by repairing and mending. There are many Repair Cafes around Adelaide (see resources) run by volunteers with varying skills that can assist in repairs of electronics, clothing, jewellery, shoes and furniture.

4. Recycle

Where items cannot be reused or repaired, look for ways to recycle before disposing in landfill.

E-Waste

Officeworks and Bunnings stores have electronic waste recycling collection.

Low-Cost Quick Wins

- Buy second-hand items from online marketplaces, stores and 'buy nothing' groups
- Utilise Repair Cafes to mend/fix broken items rather than purchasing new
- Carefully separate recyclables and food/garden waste into the correct bins





Plastic bottles, cans, cardboard and paper

Many of these common items can be recycled in the yellow lidded bin for kerbside collection. Bottles and cans can also be taken to local recyclers for a 10-cent refund under the Container Deposit Scheme.

Hard-to-Recycle items

A group of residents have created a hard-to-recycle collection point at 19 on Green Community Centre in Brompton and Hindmarsh Library for eyeglasses, mobile phones, x-rays, writing items, oral hygiene, e-waste and polystyrene. In addition, blister packs from medications can be recycled at National Pharmacies stores.

5. Food and Organic Waste

Food waste accounts for 3% of Australia's total emissions and 7.6 million tonnes of food is wasted each year, of which 70% of this is perfectly edible. Utilise the green lidded organics bin to dispose of food and garden waste and other certified compostable items including packaging.

6. Contamination

A key barrier to recycling and the recovery of resources is contamination, which makes the sorting and separation of different waste streams difficult, resulting in recyclable items ending up in landfill. 53.3% of waste placed in the red lidded landfill bin could be recycled or composted. Utilise the 'Which Bin SA' website to ensure that waste items are placed in the correct kerbside recycling bin to maximise recycling and composting opportunity.

EXAMPLE: Using the Kitchen Caddy and green lidded bin for all food scraps and organics, including garden waste.

Emissions Reduction: If every household diverted food and organic waste from landfill, utilising the green lidded organics bin, 115,000t CO₂-e total emissions reduction can be achieved by 2030.



More Resources

Which Bin SA

<https://www.whichbin.sa.gov.au/>

Adelaide Repair Café

<https://makerspaceadelaide.org/making/adelaide-repair-cafe/>

Sustainable West

<https://www.sustainablecommunitiessa.org.au/projects/sustainable-west/>

Adelaide Sustainability Centre

<https://www.adelaidesustainabilitycentre.org.au/projects/repair-cafes/>

