



**Queanbeyan – Palerang Regional Council
Climate Change Action Plan: Community
Plan Period: 2020 to 2030**

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Developed by 100% Renewables Pty Ltd



Level 32, 101 Miller Street
North Sydney 2060

www.100percentrenewables.com.au

MAYOR'S FOREWORD

Queanbeyan-Palerang Regional Council (QPRC) continues to recognise that climate change is a serious and significant issue and is committed to supporting the community in addressing it through a local response. The reasons to act now on climate change are many, and calls to action have been increasing both locally and globally.

Focusing on the community, this Action Plan accompanies Council's operations Climate Change Action Plan. The Community Climate Change Action Plan includes measures to both mitigate and to adapt to climate change impacts. Taken together these Action Plans will form the framework for Council and the community to work together to address climate change issues in our region.

The Action Plans were developed via an assessment of the opportunities available in the community to mitigate and adapt to climate change, and via engagement of Council and community stakeholders to ensure a broad range of views and ideas were input to the process. Engagement of stakeholders has helped to ensure a common understanding of the climate change issues requiring a local response and will help in fostering a Council/community partnership in implementing the Action Plans in coming years.

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¹ Image 1 (title page): Image of Acacia dealbata by Ulrike Leone from Pixabay

KEY ABBREVIATIONS

AR	Assessment Report
BAU	Business As Usual
CCAP	Council Operations Climate Change Action Plan
CCCAP	Community Climate Change Action Plan
COP	Conference Of the Parties
CO ₂ -e	Carbon Dioxide Equivalent
CO ₂	Carbon Dioxide
DCP	Development Control Plan
CSP	Community Strategic Plan
DPIE	Department of Planning, Industry and Environment
EVs	Electric Vehicles
EPA	Environmental Protection Agency
FiT	Feed in Tarrifs
GDP	Gross Domestic Product
GHG	Greenhouse Gas
HVAC	Heating, Ventilation, Air conditioning
ICLEI	Local Governments for Sustainability
IPCC	Intergovernmental Panel on Climate Change
LGA	Local Government Area
PPA	Power Purchase Agreements
PPM	Parts Per Million
P2P	Peer to Peer
PV	Photovoltaic
QPRC	Queanbeyan-Palerang Regional Council
RCP	Representation Concentration Pathways
RE	Renewable Energy
RET	Renewable Energy Target
SDGs	Sustainable Development Goals
SME	Small and Medium-Sized Enterprise
SSPs	Shared Socioeconomic Pathways
UNFCCC	United Nations Framework Convention on Climate Change

OVERVIEW

Queanbeyan-Palerang Regional Council (QPRC) recognises that climate change is a serious and significant issue and is committed to reducing its carbon footprint and supporting the community in addressing climate change. Both Council and the community have roles to play in ensuring the Queanbeyan-Palerang region contributes to efforts to mitigate climate change through action to reduce our greenhouse gas (GHG) emissions. Two documents comprise Council's Climate Change Action Plans:

- QPRC Community Climate Change Action Plan (this document)
- QPRC Council Operations Climate Change Action Plan

Both Action Plans cover the period from 2020 to 2030. The plans set out the potential for emissions abatement in Council operations and in the community, as well as actions that Council and the community can undertake to implement the plans. Council is committed to develop annual public reports on its progress implementing the plans. In addition, Council will conduct a midterm and final evaluation of the plans at the end of its term, to inform updated Climate Change Action Plans.

These plans complement other strategies that Council has developed or is developing, which also act upon climate change in our region.

Implementation of actions within the Action Plan could see the community achieve significant greenhouse gas emissions abatement over time along with substantial improvements in climate change adaptation and preparedness.





PART 1

INTRODUCTION

1. INTRODUCTION

1.1. QUEANBEYAN-PALERANG COMMUNITY STRATEGIC PLAN 2018-2028

The Queanbeyan-Palerang Community Strategic Plan (CSP) sets out the long-term aspirations of the community in terms of where we see our region over the next 10 years and the things, we most value about living here. The Strategic Plan 2018-2028 highlights five strategic pillars that the CSP is built around, including two that are particularly relevant to this Plan:

- Strategic Pillar 3: Character
 - A sustainable Queanbeyan-Palerang
 - A clean, green community that cherishes its natural and physical character
- Strategic Pillar 4: Connection
 - A connected Queanbeyan-Palerang
 - A well-connected community with good infrastructure enhancing quality of life

The five strategic pillars of the CSP, reflecting the desired outcomes are illustrated below.

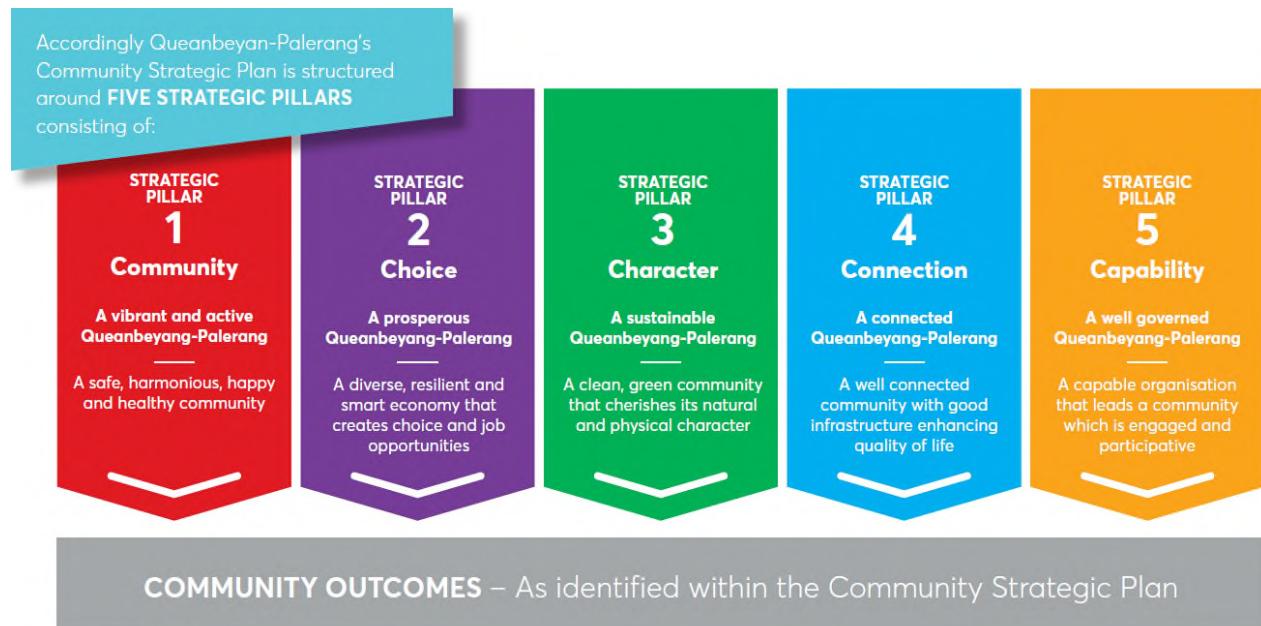


FIGURE 1: QUEANBEYAN-PALERANG COMMUNITY STRATEGIC PLAN – 5 STRATEGIC PILLARS

The five Key Goals associated with Strategic Pillar 3 provide further direction in relation to actions that need to be developed and pursued in order to meet the community's objectives.

- Key Goal 3.1: We consider the environmental impacts of future development
- Key Goal 3.2: Our region's urban landscapes are well managed and maintained promoting community pride
- Key Goal 3.3: Our natural landscapes and water resources are sustainably managed
- Key Goal 3.4: We actively promote and implement sound resource conservation and good environmental practice
- Key Goal 3.5: We ensure the future planning for the region is well coordinated and provides for its sustainable development

KEY STRATEGIES	COMMUNITY INDICATORS	DATA SOURCE
3.1 We consider the environmental impacts of future development	Level of community satisfaction on the state of the Queanbeyan-Palerang environment	Community Satisfaction Survey
3.2 Our region's urban landscapes are well managed and maintained promoting community pride	Level of community satisfaction with presentation of urban landscapes	Community Satisfaction Survey
3.3 Our natural landscapes and water resources are sustainably managed	Level of community satisfaction on the state of natural landscapes and water resources	Community Satisfaction Survey
3.4 We actively promote and implement sound resource conservation and good environmental practice	Level of community satisfaction with resource conservation and good environmental practice promoted by QPRC	Community Satisfaction Survey
3.5 We ensure the future planning for the region is well coordinated and provides for its sustainable management	Level of community satisfaction on strategic planning for the region	Community Satisfaction Survey

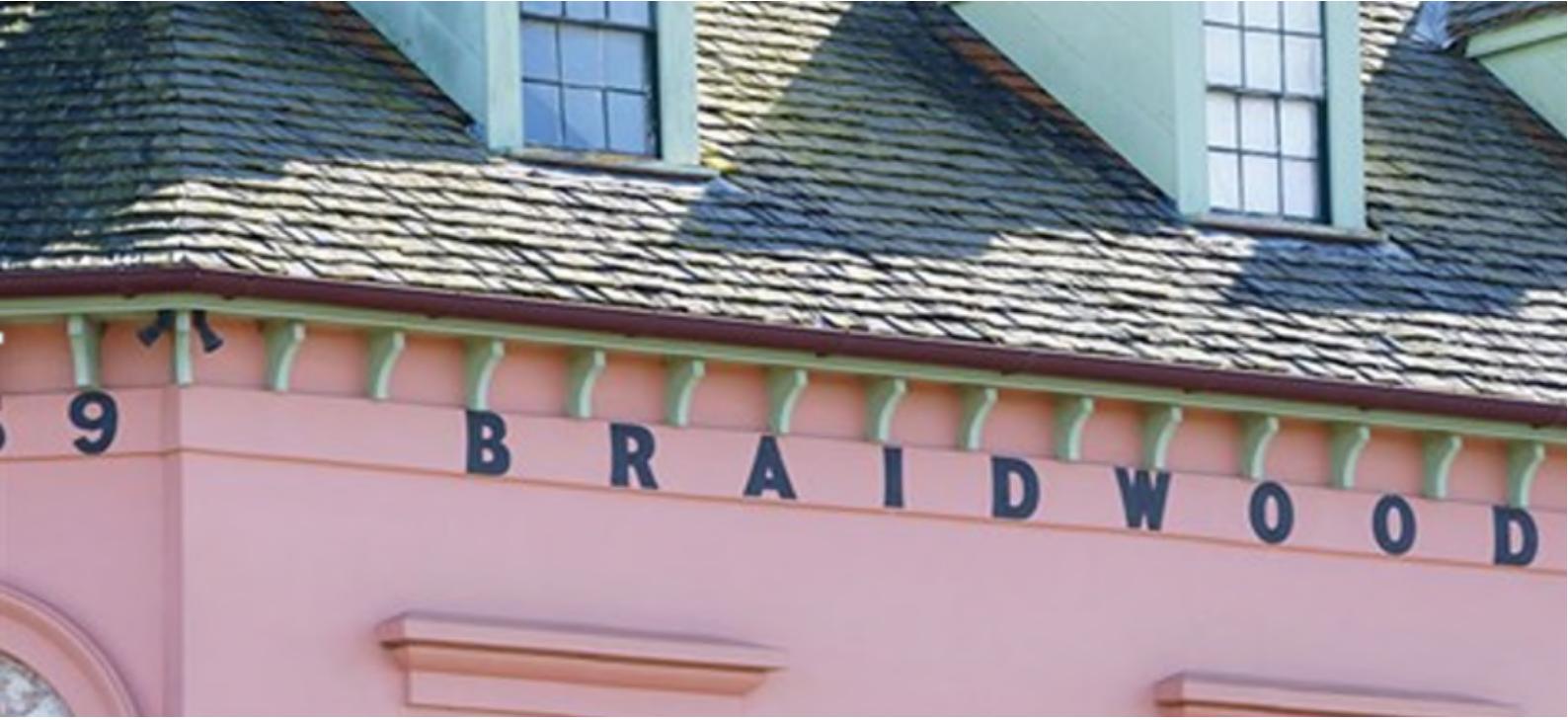
FIGURE 2: KEY GOALS ASSOCIATED WITH STRATEGIC PILLAR 3 – CHARACTER

The six Key Goals associated with Strategic Pillar 4 also provide further direction in relation to actions that need to be developed and pursued in order to meet the community's objectives.

- Key Goal 4.1: Our transport infrastructure and networks are well planned and maintained
- Key Goal 4.2: We plan for and provide access to potable water supplies for communities across our region
- Key Goal 4.3: We plan for and provide for the management of sewage, stormwater and recycled water within the communities of our region
- Key Goal 4.4: We actively promote and implement sound resource conservation and good environmental practice for our waste management system
- Key Goal 4.5: We plan for and provide regional facilities which promote better social connection and access for the community
- Key Goal 4.6: We undertake planning to ensure infrastructure is prepared for future growth

STRATEGIC PILLAR 4 - CONNECTION		
KEY GOAL	COMMUNITY OUTCOME	COMMUNITY STRATEGY – Service Objective
4.1 Our transport infrastructure and networks are well planned and maintained	The region's transport network and infrastructure allows for the safe ease of movement throughout Queanbeyan-Palerang	Support the safe and equitable movement of commuters, visitors and freight into and through the Local Government Area through contemporary maintained and renewed roads, bridge and paths infrastructure and public transport facilities
4.2 We plan for and provide access to potable water supplies for communities across our region	The region's potable water supply systems meet national standards and are managed to adequately meet community demand	Support public health and growth through integrated water cycle management and the safe and equitable delivery of potable supply to residents and businesses in Queanbeyan-Palerang
4.3 We plan for and provide for the management of sewage, stormwater and recycled water within the communities of our region	The region's sewage treatment, stormwater and recycled water systems meet national standards to support public and environmental health in our region	Support public and environmental health through integrated water cycle management and the safe and equitable treatment of sewage and stormwater, the delivery of recycled water supply to residents and businesses in the Local Government Area, and improved water quality flows into the regional environment
4.4 We actively promote and implement sound resource conservation and good environmental practice for our waste management systems	The region increases waste minimisation and greater recycling levels of our waste	Support public and environmental health and generation of business through changing community and business behaviours, minimisation of waste to landfill and greater utilisation of recycled waste
4.5 We plan for and provide regional facilities which promote better social connection and access for the community	Social connection within our region is provided for via access to a range of community facilities across the region	Support the safe and equitable access to facilities and amenities through well-presented, sited, efficient, secure and clean buildings for community, civic and recreational use
4.6 We undertake planning to ensure infrastructure is prepared for future growth	Changing community demand is met by well planned for and placed infrastructure	Provide the asset management logistics for the organisation through well planned, sited and designed infrastructure and support facilities

FIGURE 3: KEY GOALS ASSOCIATED WITH STRATEGIC PILLAR 4 – CONNECTION



1.2. 2016 CENSUS – SNAPSHOT OF QPRC LGA

Underlying the emissions profile of the LGA is data on dwellings that can be drawn from the 2016 census and is reported by profile.id. The tables below highlight key trends and facts that are relevant to the potential for increased sustainability measures².

1.2.1. RESIDENTIAL DWELLING TYPES AND COMPARISON TO 2011

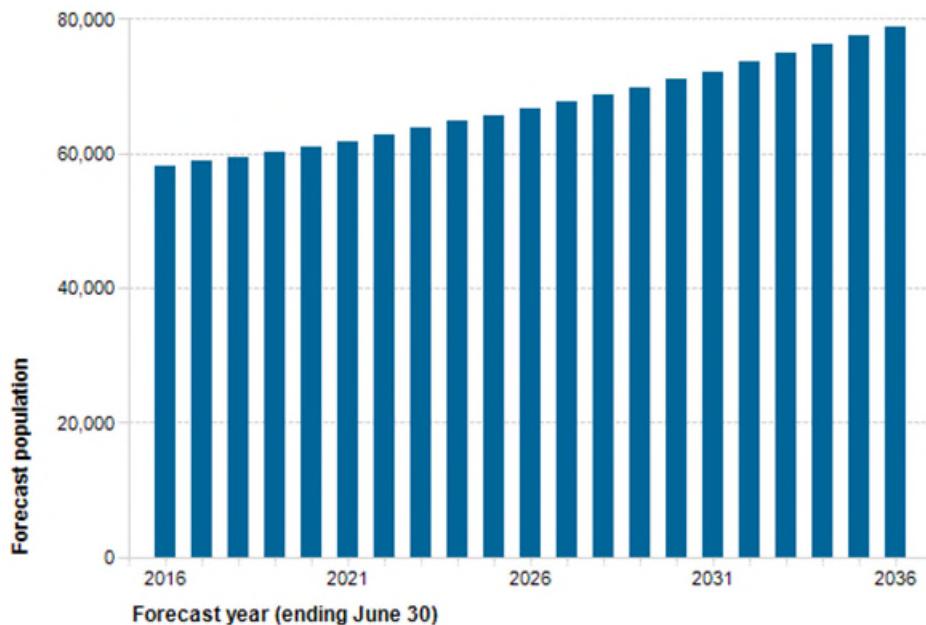
TABLE 1: DWELLINGS TREND IN QPRC LGA FROM 2011 TO 2016

QPRC - Dwellings	2016			2011			Change
	Dwelling type	Number	%	Regional NSW %	Number	%	Regional NSW %
Separate house	17,156	71.5	80.2	16,047	72.7	81.5	1,109
Medium density	4,632	19.3	14.3	4,124	18.7	14	508
High density	1,872	7.8	2.5	1,504	6.8	2.2	368
Caravans, cabin, houseboat	148	0.6	1.7	282	1.3	1.7	-135
Other	95	0.4	0.7	96	0.4	0.5	-1
Not stated	82	0.3	0.7	21	0.1	0.2	61
Total Private Dwellings	23,985	100	100	22,074	100	100	1,910

² Source: Australian Bureau of Statistics, Census of Population and Housing 2011 and 2016. Compiled and presented by .id , the population experts. <https://home.id.com.au>

1.2.2. FORECAST POPULATION CHANGES

According to Profile ID³, the Queanbeyan-Palerang Regional Council's estimated resident population for 2018 is 59,959, with a population density of 0.11 persons per hectare. The population forecast for 2019 is 60,190 and is forecast to grow to 78,756 by 2036⁴ as shown in the graphic below.



Population and household forecasts, 2016 to 2036, prepared by .id, December 2017.



FIGURE 4: FORECAST POPULATION GROWTH FOR THE QPRC AREA

Of the forecast 19,000-person growth, approximately 10,500 are expected in Googong (248% growth) and approximately 6,000 in Tralee-Environa.

1.2.3. SOLAR UPTAKE IN THE QUEANBEYAN-PALERANG LGA

Some 20.7% of dwellings (APVI <http://pv-map.apvi.org.au/>) in the local government area (LGA) have installed solar PV as of mid-April 2020. This places Queanbeyan-Palerang Regional LGA in the middle of NSW councils in terms of the number of residents taking up solar panels. In addition to 4,507 residential systems there have been 375 installations of 10-100 kW in capacity, which tend to be commercial-scale systems, plus three systems greater than 100 kW in scale.

Local governments near Queanbeyan-Palerang have comparable levels of solar PV uptake. Councils in the north of the state, including Tweed, Moree Plains and Narrabri, have reached solar uptake levels of 35% to 42% and lead the way for NSW councils.

³ <https://profile.id.com.au/queanbeyan-palerang>

⁴ <https://forecast.id.com.au/queanbeyan-palerang>

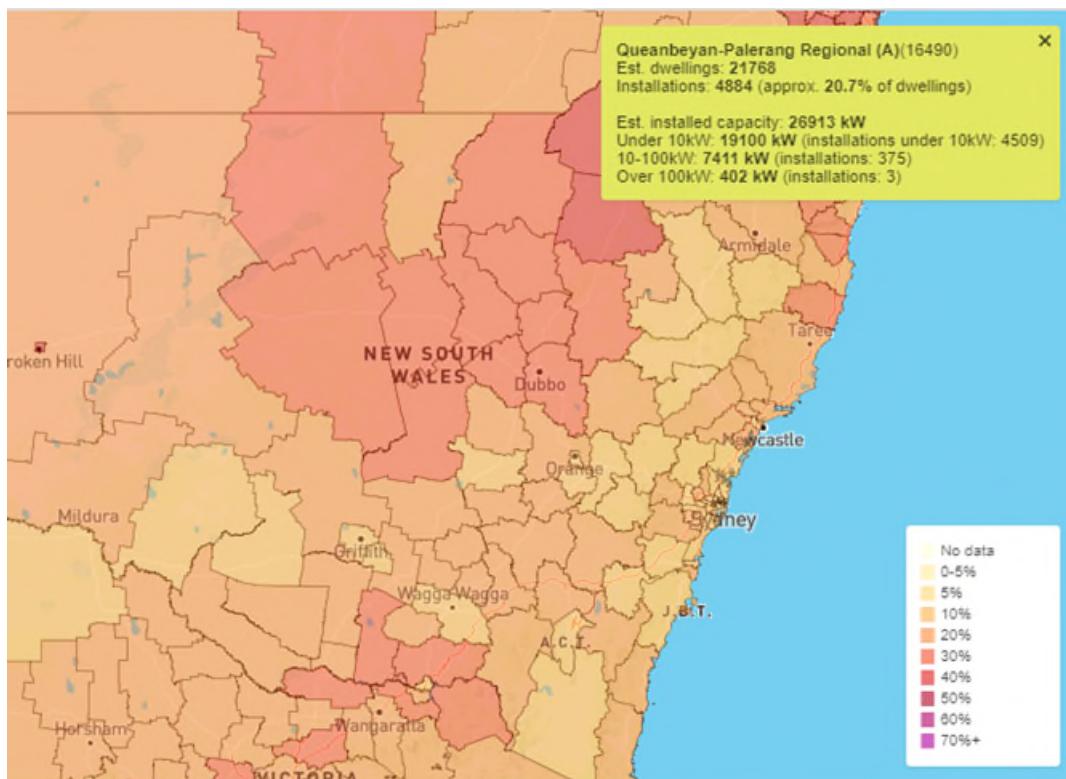


FIGURE 5: SOLAR PV UPTAKE IN NSW LGA'S (APVI 2020)⁵

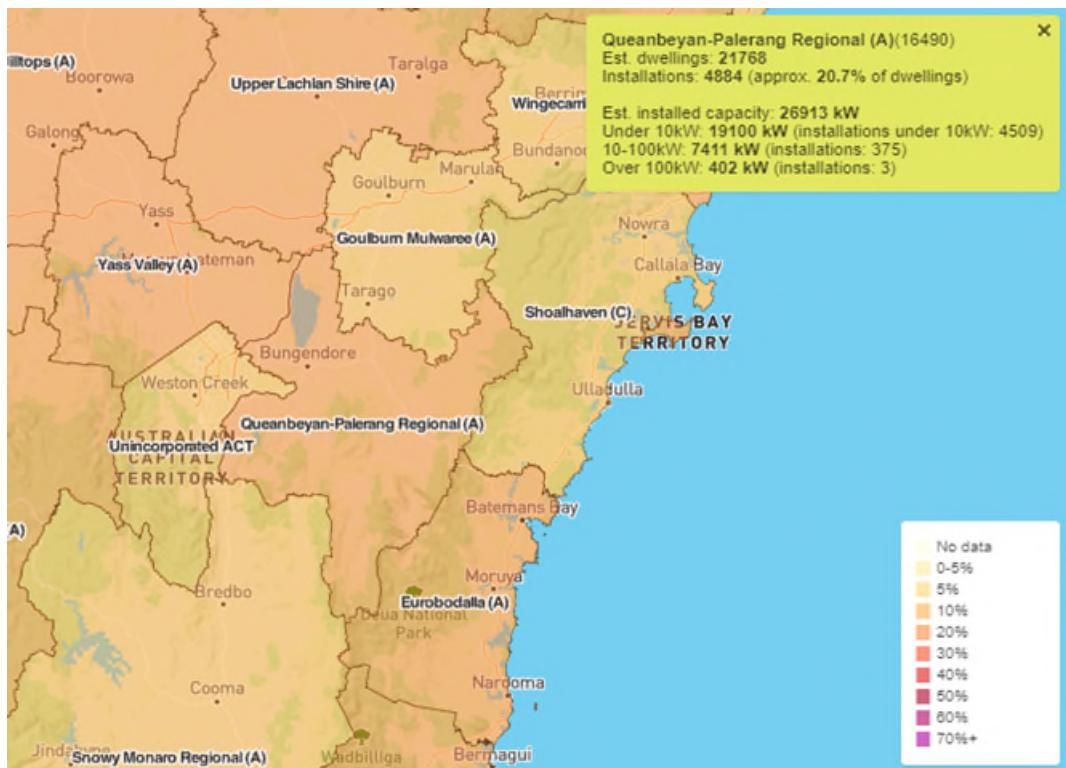


FIGURE 6: SOLAR PV UPTAKE IN QPRC (APVI 2020)⁶

⁵ Sourced from: <http://pv-map.apvi.org.au/>

⁶ Sourced from: <http://pv-map.apvi.org.au/>

1.2.4. BUSINESS PROFILE OF QUEANBEYAN-PALERANG

Data reported by profile.id also includes businesses within the LGA. There are a total of 4,683 active and registered-for-GST businesses in QPRC. The data show high concentrations of businesses in Queanbeyan, as well as near Bungendore and Googong.

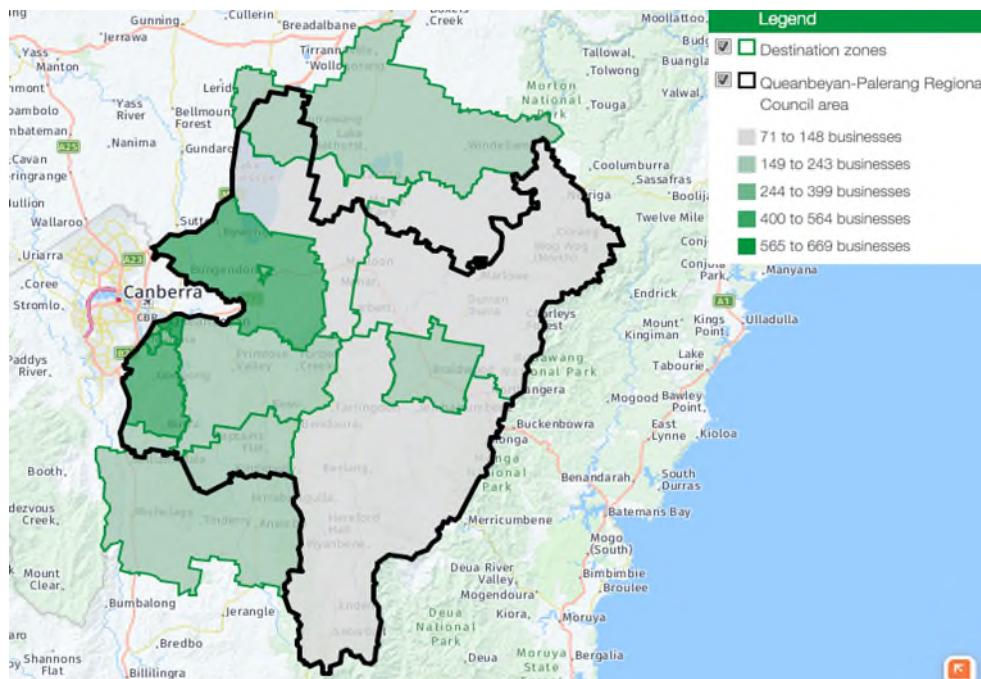


FIGURE 5: “HEAT MAP” SHOWING AREAS OF HIGH BUSINESS CONCENTRATION IN QPRC LGA⁷

1.3. PAST CLIMATE CHANGE PLANS

1.3.1. COMMUNITY CLIMATE CHANGE ACTION PLAN 2013-17

The Community Climate Change Action Plan (CCCAP) 2013-2017 was developed by Queanbeyan City Council (QCC) to recognise and address climate change through a local response. The CCCAP formed a framework for Council and the community to work together on addressing climate change issues. A separate plan was developed for Council operations (The QCC Operational Climate Change Action Plan). The overall objectives of the plan were:

- a significant reduction of waste, energy use and fuel consumption in Queanbeyan
- the implementation of positive actions to increase community resilience, confidence and resolution in dealing with the challenges of climate change and realising the benefits and opportunities that result from those actions.

The ‘Aspirational goal’ of the plan was for **‘Council and the community partner to work together for a significant reduction in Queanbeyan’s Greenhouse Gas emissions by 2020’**. This ‘goal’ would be likened to at least a 25% reduction in emissions and was established based on feedback from the community.

⁷ Sourced from <https://economy.id.com.au/willoughby/business-locations>



Difficulty in obtaining accurate data for many of the actions was a challenge to monitor in terms of actual GHG savings. Hence the aspiration goal of at least a 25% reduction in Queanbeyan GHG's was unable to be verified. Some major highlights included:

- Googong Sustainable Housing Project
- ActSmart Program for Local Businesses
- Education Campaigns e.g. Hey Tosser and Garage Sale Trail

1.3.2. COUNCIL OPERATIONS CLIMATE CHANGE ACTION PLAN 2013-17

The Council Operations Climate Change Action Plan 2013-2017 (CCAP) was developed by QCC to recognise and address climate change through a local response. The aim of the plan was to set out a baseline and understanding of Council's emissions sources, establish a realistic yet ambitious target for reducing these emissions and put forward practical actions to achieve these targets.

Discussions with staff led to the development of a target of 25% reduction in total Council GHG emissions from the 2009/2010 baseline by 2020. Some major highlights included:

- Installation of solar power on a number of Council facilities and buildings
- Integration of the action plan into a number of Council policies
- Development of a Council Sustainable Building Design Policy

PART 2

BROADER CONTEXT FOR

CLIMATE CHANGE

ACTION

2. BROADER CONTEXT FOR ACTION ON CLIMATE CHANGE

2.1. WHAT IS CLIMATE CHANGE?

Climate is the set of averages, variation and extremes of weather in a region over long periods of time. Thirty years or more is the usual period for estimating average climate. Geological and historical records show that the earth's climate has always been dynamic, with change driven by natural cycles and events. However, over the last three centuries, since the beginning of the Industrial Revolution (mid-18th century) there is substantial evidence that the world has been rapidly warming (global warming) and the climate has been changing at a greater rate. Scientific evidence has found that it is extremely likely that human influence has been the dominant cause of the observed global warming and the resulting climate shift. Significant quantities of GHG's such as carbon dioxide (CO_2), nitrous oxide and methane, have been added to the earth's atmosphere from activities such as the burning of fossil fuels, land clearing and waste disposal. This enhances the greenhouse effect by absorbing infrared radiation which heats the planet, resulting in the observed global warning and climate changes for example the increased frequency and severity of drought. The term climate change is now commonly used to refer to anthropogenic (human caused) climate change and global warming, rather than the result of natural processes.

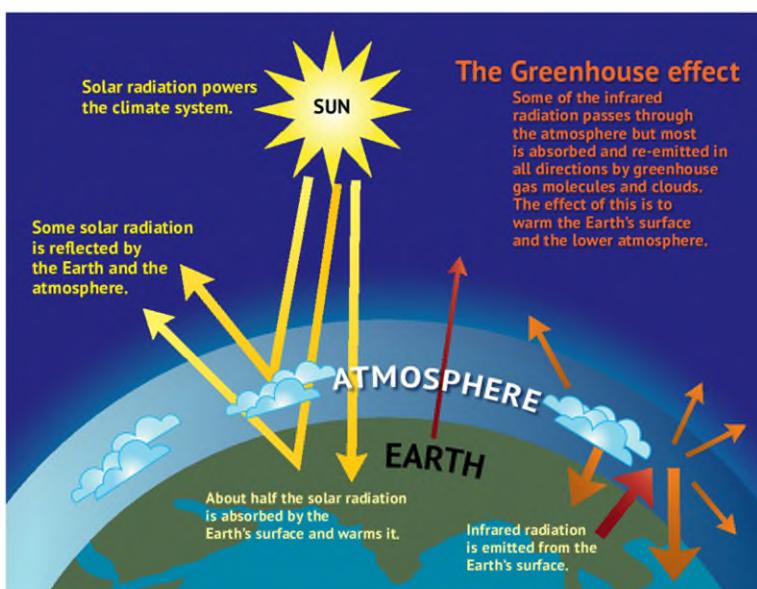


FIGURE 86: OVERVIEW OF THE GREENHOUSE EFFECT

Sourced from: <https://climate.nasa.gov/>

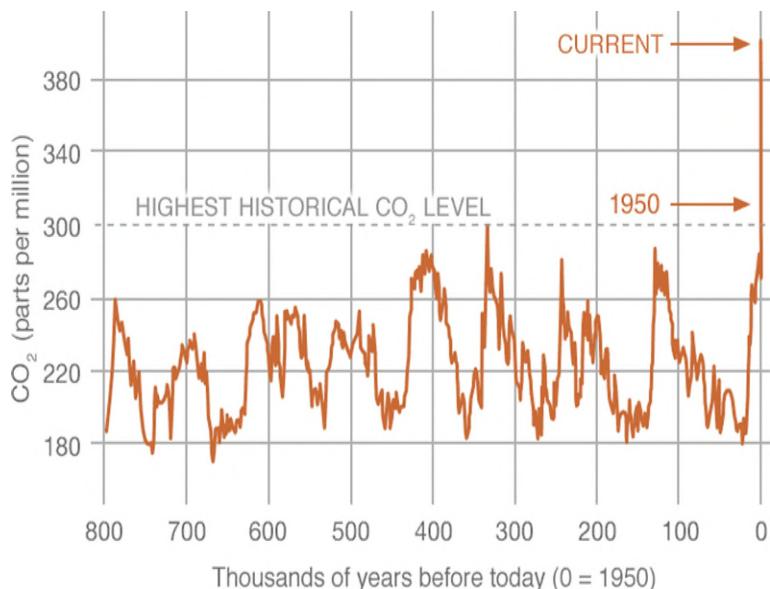


FIGURE 9: ATMOSPHERIC CO₂ CONCENTRATIONS PPM (LAST THREE GLACIAL CYCLES)

Sourced from: <https://climate.nasa.gov/>

Data collected by the CSIRO shows that the concentration of carbon dioxide in our atmosphere in March 2020 was approximately 408.6 parts per million (PPM)⁸. The level of carbon dioxide in the Earth's atmosphere is now higher than at any time over the past 800,000—and possibly 20 million—years. Similarly, the levels of the other two GHG's, methane and nitrous oxide, have risen significantly in recent years.

Carbon dioxide and other GHG's were produced in NSW in 2017 by the following activities⁹:

⁸ <https://www.csiro.au/en/Research/Oceans/Assessing-our-climate/Latest-greenhouse-gas-data>

⁹ Sourced from: <https://climatechange.environment.nsw.gov.au/About-climate-change-in-NSW/NSW-emissions>

- * Stationary energy – 50-%
- * Coal Mines- 11%
- * LULUCF- (negative) 10%

- * Transport- 21%
- * Industry- 10%

- * Agriculture- 15%
- * Waste- 2%

This accumulation of atmospheric GHG's is already having an economic, social and environmental impact. Some environmental changes are irreversible and if not addressed will have severe future implications. Furthermore, the costs of climate change inaction is likely to be significant with some models predicting that the Australian economy (GDP) could lose 130 billion per year if Paris Agreement targets are not met¹⁰.

2.1.1. EMISSION SCENARIOS AND SHARED SOCIOECONOMIC PATHWAYS

Representation Concentration Pathways (RCPs) are scenarios that describe alternative trajectories for a number of GHG's and the resulting atmospheric concentrations from 2000 to 2100. The four RCP scenarios as defined by the Intergovernmental Panel on Climate Change (IPCC) Assessment Report (AR) 5¹¹ are:

- RCP 2.6- Methane emissions reduced by 40%, CO₂ emissions decline by 2020 and become negative in 2100.
- RCP 4.5- Stable methane emissions, CO₂ emissions increase only slightly before decline commences around 2040.
- RCP 6.0- Stable methane emissions, CO₂ emissions peak in 2060 at 75 per cent above today's levels, then decline to 25 per cent above today.
- RCP 8.5- Characterized by increasing Methane and CO₂ emissions that lead to high concentrations overtime¹².

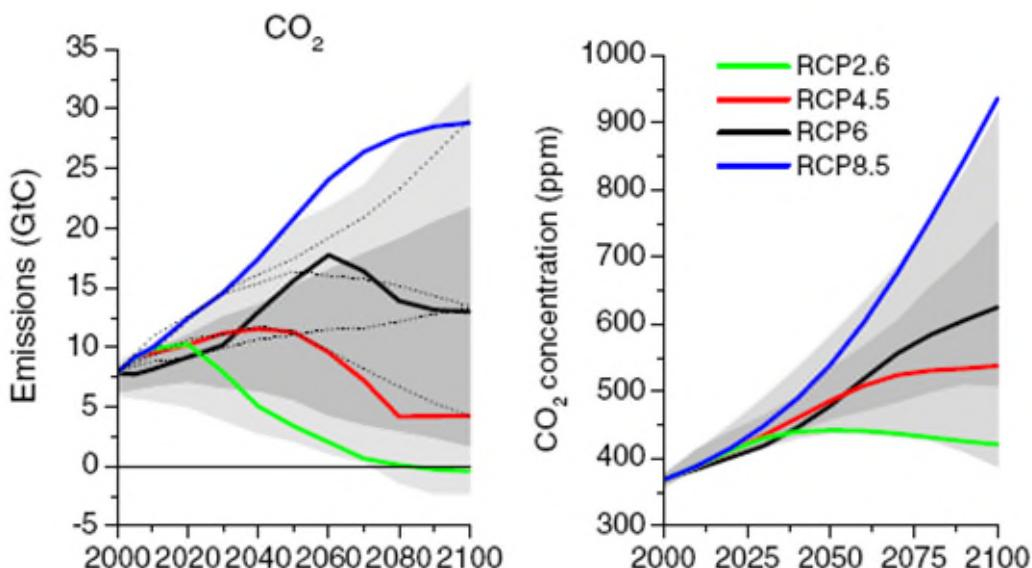


FIGURE 10: RCP SCENARIOS OF CO₂ EMISSIONS

The Intergovernmental Panel on Climate Change (IPCC) predicts an increase of global mean surface temperature by the end of the 21st century (2081-2100) relative to 1986-2005 is *likely* to be 0.3°C to 1.7°C under RCP2.6, 1.1°C to 2.6°C under RCP4.5, 1.4°C to 3.1°C under RCP6.0, and 2.6°C to 4.8°C under

¹⁰ Sourced from: <https://www.tai.org.au/content/analysis-130-billion-year-benefit-gdp-avoiding-climate-change>

¹¹ <https://www.ipcc.ch/report/ar5/syr/>

¹² New Coast: Strategies for Responding to Devastating Storms and Rising Seas

RCP8.5¹³. Please note the IPCC are set to include three new RCP scenarios in the upcoming AR6 report (due to be released in 2021-2022) those being RCP 1.9, RCP 3.4 and RCP 7.0.¹⁴

Shared Socioeconomic Pathways (SSPs) are new ‘pathways’ that have been developed over the past decade that examine how global society, demographics and economics might change over the century. These SSPs are now being used as important inputs for the latest climate models, feeding into the IPCC AR6¹⁵. Each SSP looks at how the different RCPs could be achieved within the context of the underlying socioeconomic characteristics and shared policy assumptions of that world. The SSPs five alternative socio-economic futures compromise:

- SSP1: Sustainability- Taking the Green Road (Low challenges to mitigation and adaptation)
- SSP2: Middle of the Road (Medium challenges to mitigation and adaptation)
- SSP3: Regional Rivalry- A Rocky Road (High Challenges to mitigation and adaptation)
- SSP4: Inequality- A Road Divided (Low challenges to mitigation, high challenges to adaptation)
- SSP5: Fossil- fuelled Development- Taking the Highway (High challenges to mitigation, low challenges to adaptation)

When combined with the RCPs they provide a powerful framework to explore the space of future mitigation and adaptation pathways in terms of different levels of mitigation stringency and different assumptions about socioeconomic development¹⁶.

2.2. THE DIFFERENCE BETWEEN CLIMATE CHANGE MITIGATION AND ADAPTATION

Climate change mitigation refers to a reduction of GHG emissions to limit global warming and climate change. Climate change adaptation, on the other hand, refers to the preparation for the changes that come with climate change, such as extreme weather events, or an extended number of hot days.

¹³ Sourced from: <https://www.ipcc.ch/report/ar5/syr/>

¹⁴ Sourced from: <https://www.carbonbrief.org/>

¹⁵ Sourced from: <https://www.carbonbrief.org/>

¹⁶ Sourced from: <https://www.sciencedirect.com/science/article/pii/S0959378016300681>

2.3. GLOBAL RESPONSE TO CLIMATE CHANGE

Internationally, there are three primary drivers for urgent action on climate, additional to the second commitment period of the Kyoto Protocol from 2013 to 2020. These are:

1. Sustainable Development Goals (SDGs)

- In 2015, countries adopted the 2030 Agenda for Sustainable Development and its 17 SDGs. Governments, businesses and civil society together with the United Nations are mobilising efforts to achieve the Sustainable Development Agenda by 2030¹⁷. The SDGs came into force on 1 January 2016, and call on action from all countries to end all poverty and promote prosperity while protecting the planet.

2. Paris Agreement

- To address climate change, countries adopted the Paris Agreement at the Conference of the Parties (COP) 21 in Paris on December 25th 2015. The Agreement entered into force less than a year later. In the agreement, signatory countries agreed to work to limit global temperature rise to well below 2° Celsius, and given the grave risks, to strive for 1.5° Celsius¹⁸.

3. IPCC Reports

- In October 2018 in Korea, governments approved the wording of a special report on limiting global warming to 1.5°C. The report indicates that achieving this would require rapid, far-reaching and unprecedented changes in all aspects of society. With clear benefits to people and natural ecosystems, limiting global warming to 1.5°C compared to 2°C could go hand in hand with ensuring a more sustainable and equitable society¹⁹. The report states that limiting warming to 1.5°C implies reducing CO₂ emissions by 45% by 2030 (from 2010 levels) and reaching net zero CO₂ emissions globally around 2050 with concurrent deep reductions in emissions of non-CO₂ forcers, particularly methane²⁰.



FIGURE 11: GLOBAL CONTEXT FOR ACTION ON CLIMATE CHANGE

In addition, the World Economic Forum's Global Risks Report 2019²¹ highlights adverse climate change-related outcomes as among the most likely to occur with the highest impacts to the global economy.

¹⁷ Sourced from <https://www.un.org/sustainabledevelopment/development-agenda/>

¹⁸ Sourced from <https://www.un.org/sustainabledevelopment/climatechange/>

¹⁹ Sourced from https://www.ipcc.ch/news_and_events/pr_181008_P48_spm.shtml

²⁰ Sourced from <https://www.ipcc.ch/sr15/>

²¹ <https://www.weforum.org/reports/the-global-risks-report-2019>

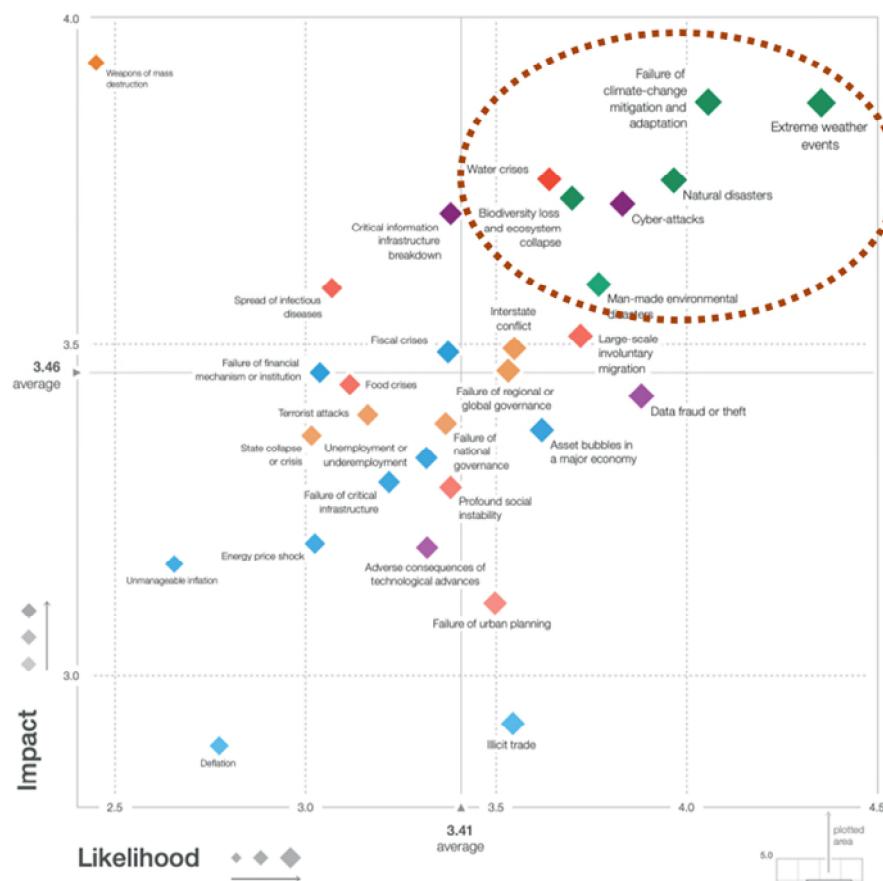


FIGURE 12: GLOBAL RISKS REPORT – LIKELIHOOD & IMPACT OF CLIMATE, OTHER RISKS TO GLOBAL ECONOMY

2.4. NATIONAL, STATES AND TERRITORIES RESPONSE TO CLIMATE CHANGE

National Response

At a national level, Australia's response to the Paris Agreement has been to set a goal for GHG emissions of 5% below 2000 levels by 2020 and GHG emissions that are 26% to 28% below 2005 levels by 2030. A major policy that currently underpins this is the Renewable Energy Target (RET). This commits Australia to source 20% of its electricity (33,000 GWh p.a., estimated to equate to a real 23% of electricity) from eligible renewable energy sources by 2020. The scheme runs to 2030. These two key targets are illustrated below.



FIGURE 73: AUSTRALIA'S RENEWABLE ENERGY AND EMISSION REDUCTION GOALS – NATIONAL LEVEL

At a sub-national level, most states and territories have established aspirational emissions targets as well as some legislated targets for renewable energy, as seen below.

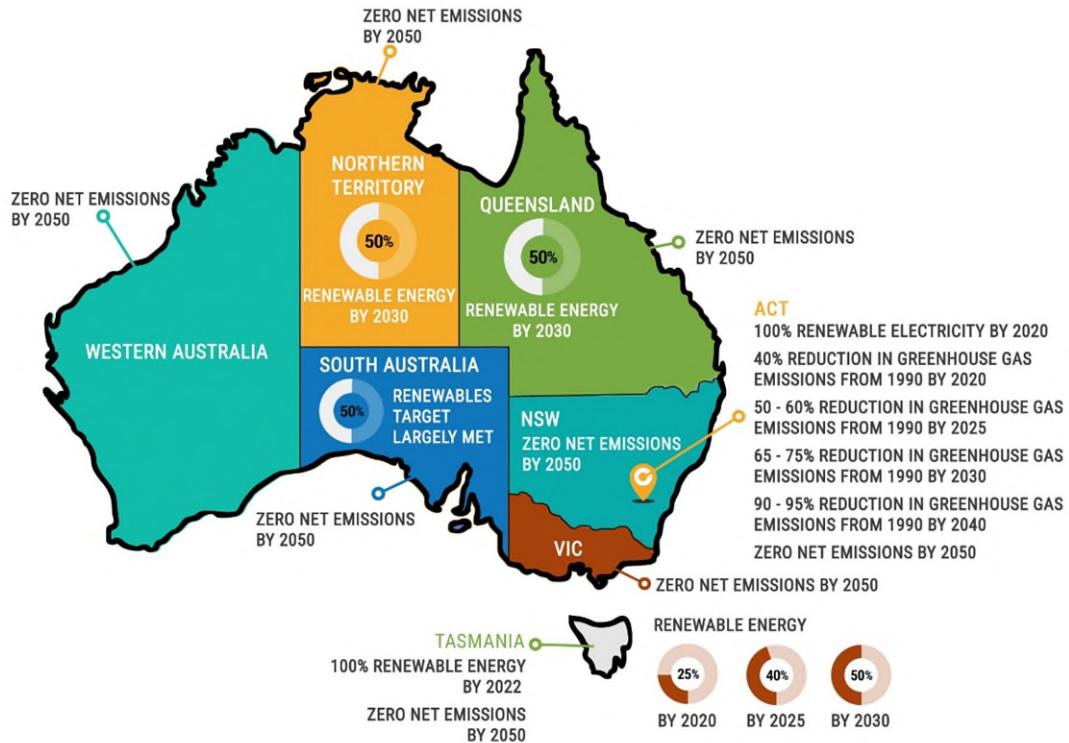


FIGURE 14: AUSTRALIA'S RENEWABLE ENERGY AND EMISSION REDUCTION GOALS – STATE & TERRITORY LEVEL

NSW Response

The NSW Government is committed to effective action on climate change and has developed a wide range of policies, strategies, and frameworks to reduce emissions and adapt to a changing climate.

NSW Climate Change Policy Framework²²

Outlines the State's target of reaching net-zero emissions by 2050. This helps to set expectations about future GHG emissions pathways to help others to plan and act.

Net Zero Plan Stage 1: 2020–2030²³

This is a big milestone that sees the first of three 10-year plans released that will set a pathway to net zero emissions by 2050 by creating new jobs, cutting household costs and attracting investment.

Some of the key highlights and priorities of the Plan include:

- Commits NSW to reducing State emissions (from 2005 levels) **by 50% by 2030 & net zero by 2050** and articulates that this is a shared responsibility. There is a clear expectation that all business sectors, individuals, and governments must play their part.
- Drives uptake of proven emissions reduction technologies that grow the economy, create new jobs, and reduce the cost of living, by;

²² <http://www.environment.nsw.gov.au/topics/climate-change/policy-framework>

²³ © State of New South Wales 2020. Published March 2020

- Establishing a \$450 million Emissions Intensity Reduction Program & \$450 million Climate Solutions Fund to support business, farms, and land managers to transition to low emissions alternatives and undertake low-cost actions to reduce emissions.
- Providing an additional \$1.07 billion in funding via both NSW and Commonwealth Governments for a range of measures.
- Commits to a net zero emissions target for organic waste by 2030.
- Establishes an Energy Security Safeguard (Safeguard) to extend and expand the Energy Savings Scheme and Programs.
- Expanded Electric and Hybrid Vehicle Plan with the Electric Vehicle Infrastructure and Model Availability Program to fast-track the EV market in NSW.
- Primary Industries Productivity and Abatement Program to support primary producers and landowners to commercialise low emissions technologies.
- Development of a Green Investment Strategy, with Sydney as a world leading carbon services hub by 2030.
- Empowers consumers and business to make sustainable choices
 - Enhancement of the EnergySwitch service by allowing consumers to compare the emissions performance of energy retailers.
 - Advocate to expand NABERS to more building types and improve both the National Construction Code and BASIX.
- Invests in the next wave of emissions reduction innovation
 - To boost commercialisation of low-emissions hydrogen production and applications, the NSW Government will establish a Hydrogen Program that will help the scale-up of hydrogen as an energy source and feedstock. The NSW Government will set an aspirational target of up to 10% hydrogen in the gas network by 2030.
 - Establishment of a Clean Technology Program to develop and commercialise emissions reducing technologies that have the potential to commercially out-compete existing emissions-intense goods, services and processes.
- Ensures the NSW Government leads by example.
 - Aligning action by government under GREP with the broader state targets through clear targets for rooftop solar, EVs, electric buses, diesel-electric trains, NABERS for Government buildings, power purchasing and expansion of national parks
- Attracts up to \$37 billion in private investment.

Council will continue to work with and support the NSW Government in their goal to reduce the States (communities) emissions by 50% by 2030 (from 2005 levels) and net zero emissions by 2050. This will be aided through the delivery and implementation of the QPRC Climate Change Action Plans 2020-2030.

Climate Change Fund (CCF) 2017-2022 Draft Strategic Plan

Established to address the impacts of climate change, encourage energy and water saving activities and increase public awareness and acceptance of climate change. Several initiatives are currently being progressed with a total funding allocation of \$170 million. The five major initiatives being developed include:

1. supporting regional community energy projects and community energy hubs to give communities more control, avoid costly infrastructure upgrades and reduce rural energy costs.
2. supporting feasibility studies and commercialisation of emerging energy projects including pumped hydro generation and utility-scale batteries, with potential co-funding from the

Australian Renewable Energy Agency, to bring forward private sector investment to support the next generation of energy and storage projects in NSW.

3. providing small incentives to coordinate assets such as home and electric vehicle storage to beat energy peaks and provide household demand response to the grid, as highlighted by AEMO and the NSW Energy Security Taskforce as a key priority for system security.
4. supporting energy storage in state-owned sites, such as schools, to lower peak demand and potentially attract investment in local manufacturing.
5. increasing the energy-savings for eligible recipients of the Low-Income Household Rebate by allowing them to opt-out of the rebate and install a solar system on their roof. This would add solar capacity to the grid and more than double the energy-savings for the households involved.

NSW Electricity Strategy & NSW Electricity Infrastructure Roadmap

Sets out the NSW Government's plans to transform the electricity system into one that is affordable, clean, and resilient through investment in generation, storage and firming infrastructure and making it easier to do energy business in NSW. Importantly the plans set out to deliver the state's first 5 Renewable Energy Zones (REZs) in the Central-West Orana, New England, South-West, Hunter-Central Coast, and Illawarra regions. These REZs will play a vital role in delivering affordable, reliable energy generation to help replace the State's existing power stations as they come to their scheduled end of operational life.

The Central-West Orana, New England, and South-West REZs will unlock a significant pipeline of large-scale renewable energy and storage projects, while supporting up to \$20.7 billion of private sector investment in the regions and over 5000 construction jobs at their peak.

FIGURE 15: INDICATIVE RENEWABLE ENERGY ZONES



NSW Electric Vehicle Strategy

The NSW Electric Vehicle Strategy is the NSW Government's plan to accelerate the State's vehicle fleet of the future. It outlines the government's commitments to increasing the uptake of electric vehicles to ensure New South Wales shares in the benefits. The Strategy is intended to increase EV sales to 52% by 2030–31 and help NSW achieve net-zero emissions by 2050.

NSW Hydrogen Strategy

The NSW Hydrogen Strategy brings together the NSW Government's existing and new policies into a framework to support the development of a commercial green hydrogen industry in NSW. The strategy, which will provide up to \$3 billion in incentives is set to attract more than \$80 billion in investment and drive deep decarbonisation. In addition to delivering an already committed \$70 million to develop the State's hydrogen hubs in the Illawarra and the Hunter, the strategy includes:

- Exemptions for green hydrogen production from government charges.
- A 90% exemption from electricity network charges for green hydrogen producers who connect to parts of the network with spare capacity.
- Incentives for green hydrogen production.
- A hydrogen refuelling station network to be rolled out across the State.

Adapt NSW

The NSW Department of Planning Industry and Environment (DPIE) has developed the AdaptNSW program and website²⁴ which offers a range of regionally and state based information and data about climate change impacts, projections and how businesses, governments and communities can adapt to future conditions.

2.5. NSW LOCAL GOVERNMENTS RESPONSE TO CLIMATE CHANGE

While there are a large number of examples of what local governments around the world are doing, we focus here on Australia and on New South Wales in particular, as this is broadly representative of what is occurring in many other countries or regions. Two approaches in particular are relevant.

1. Adoption and publication of ambitious targets for renewable energy and/or emissions for Council operations, and potentially adopting or setting targets for renewables or emissions reduction in the community.
 - a. The chart below shows the current status of target-setting by local councils in NSW (as at September 2020). A total of 33 councils and towns, plus the ACT have set ambitious goals for renewable energy and/or emissions – typically 50-100% renewable energy or renewable electricity, and some net zero emissions targets are seen.
 - b. Typically, Councils set targets following a period of analysis of their data and information, and/or consultation with their stakeholders.
 - c. Other councils have developed plans and have adopted internal targets but have not publicly released these at this time.
2. Partnering with local government-focused emission reduction programs such as the Cities Power Partnership (CPP), as of May 2019, 43 NSW local councils were part of CPP. While this does not involve setting specific targets per se, the commitment to key actions can either serve as a set of de facto targets or can provide a basis from which to set targets in future.

²⁴ <https://climatechange.environment.nsw.gov.au/>

There has been a trend towards staged and evidence-based target setting compared with aspirational targets that may set the goal first to reflect what is required to decarbonize and then develop the plan to fit this goal.

There has also been a small but increasing trend towards examining the scope for renewables and abatement in communities, in terms of local action and how communities can participate more in the shift to renewable energy at scale. This is being informed by greater awareness of the need to act on climate, growing accessibility of information on community emissions, and the desire to ensure that communities and local business are part of and benefit from technology changes that are occurring.

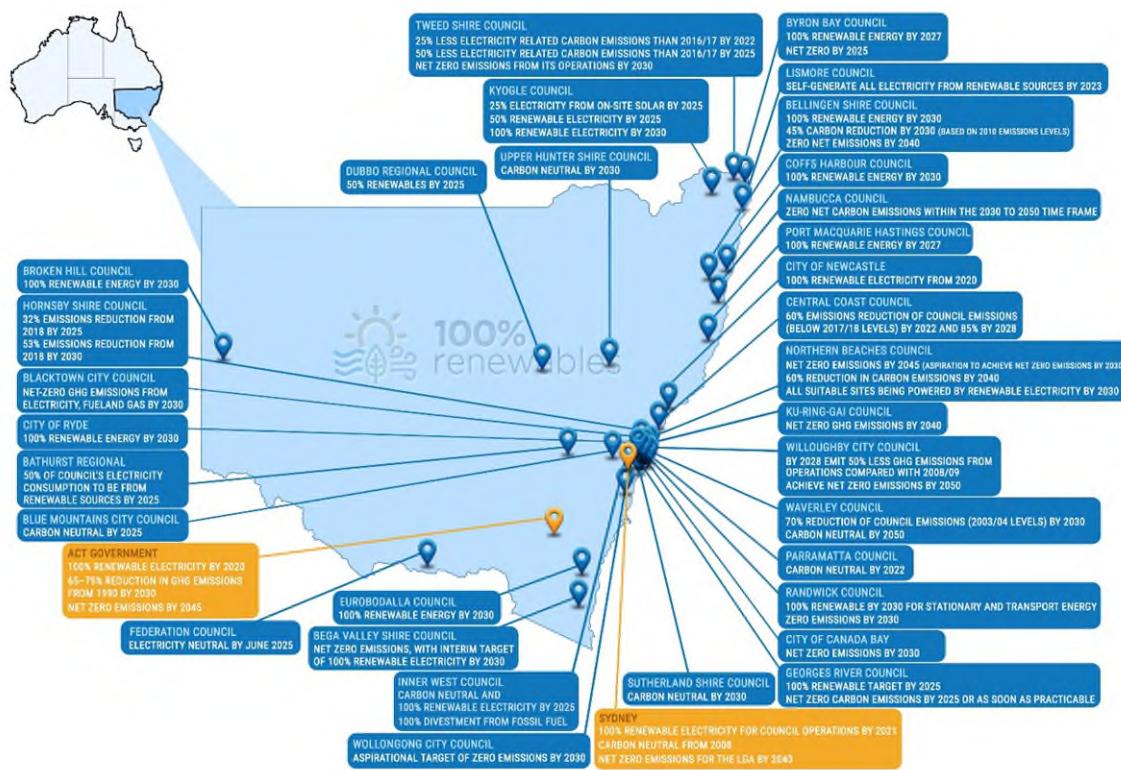


FIGURE 16: RENEWABLE ENERGY & EMISSION REDUCTION TARGETS BY NSW COUNCILS AND COMMUNITIES

2.6. Queanbeyan-Palerang Targets

QPRC has adopted the following emissions reduction targets for its internal operations (as established in the QPRC Operations Sustainability Policy) and the QPRC community. These targets are:

Energy & Transports Emissions (Council Operations): 30% reduction in total greenhouse gas emissions by 2025 from 2012-13 baseline levels.

Community Emissions: support the NSW Government in their goal to reduce the States (communities) emissions by 50% by 2030 (from 2005 levels) and net zero emissions by 2050.



PART 3

COMMUNITY CARBON

FOOTPRINT

3. GREENHOUSE GAS EMISSIONS

3.1. AUSTRALIA'S GHG EMISSIONS

According to the Australian Government Department of the Environment and Energy, 'Australia is taking a strong, credible and responsible commitment to the Paris climate change agreement to reduce emissions by 26-28 per cent on 2005 levels by 2030'²⁵. The Australia's government believes the 2030 target is achievable with current Direct Action policies that reduce emissions.

Contradictory however, the 2018 Climate Council of Australia's 'Rising Greenhouse Gas Emissions Report' found that Australia's emissions have actually increased over the past 3 years including by 1.5% in 2017 from 2016 levels. The report also stated that under current policy settings, Australia will not meet its 26-28% emissions reduction target²⁶.

It is important to note that Australia is only responsible for about 1.3-1.4 % of global GHG emissions or roughly 538.9 Mt CO₂-e annually as of March 2019²⁷. Despite this Australia is still one of the highest emitters of GHG's in the world per capita (21.4 t CO₂-e per person, annually).

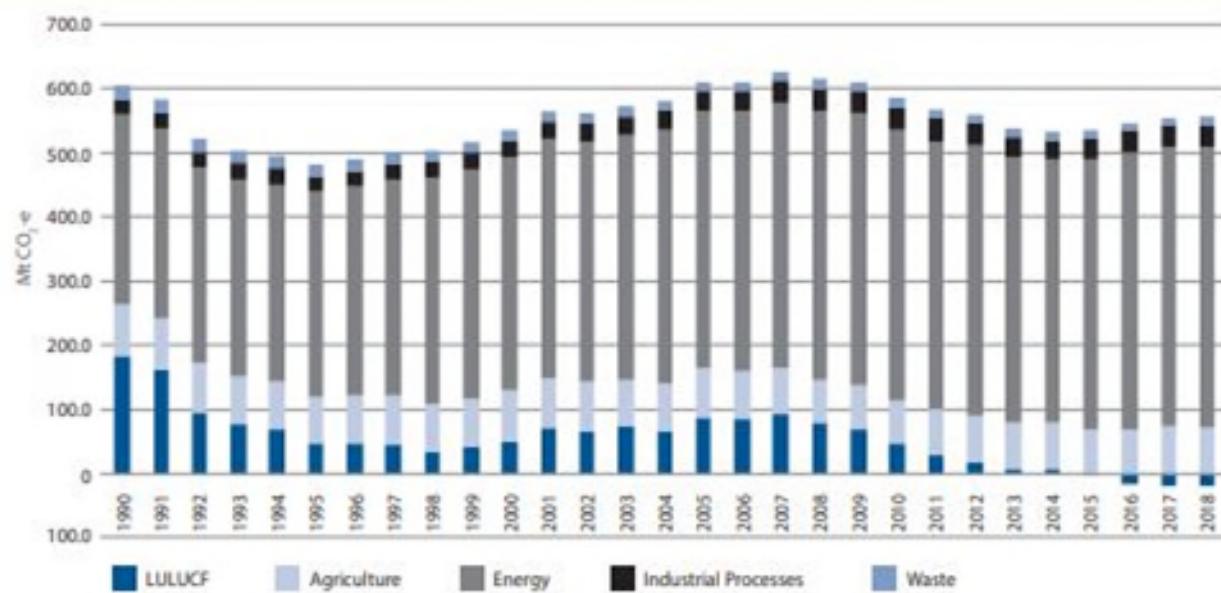


FIGURE 17: NET GHG EMISSIONS UNDER THE UNFCCC, BY SECTOR, AUSTRALIA, 1990-2018

²⁵<https://www.environment.gov.au/climate-change/publications/factsheet-australias-2030-climate-change-target>

²⁶<https://www.climatecouncil.org.au/resources/australias-rising-greenhouse-gas-emissions/>

²⁷<http://www.environment.gov.au/system/files/resources/29eca947-af49-4ed1-8369-e68d74730cf9/files/national-inventory-report-2017-volume-1.pdf>

3.2. THE COMMUNITY'S GHG EMISSIONS

Queanbeyan-Palerang community GHG emissions in 2017 were 830,700 tonnes of carbon dioxide equivalent (t CO₂-e). Most of these emissions (445,503.9 t CO₂-e) came from electricity and natural gas consumption in the community. This was followed by 260,673.66 t CO₂-e of transport emissions, 25,834.77 t CO₂-e of emissions from waste and 98,687.16 t CO₂-e of emissions from agriculture.²⁸

The graph below shows the communities carbon footprint and the percentage contribution of emission sources.

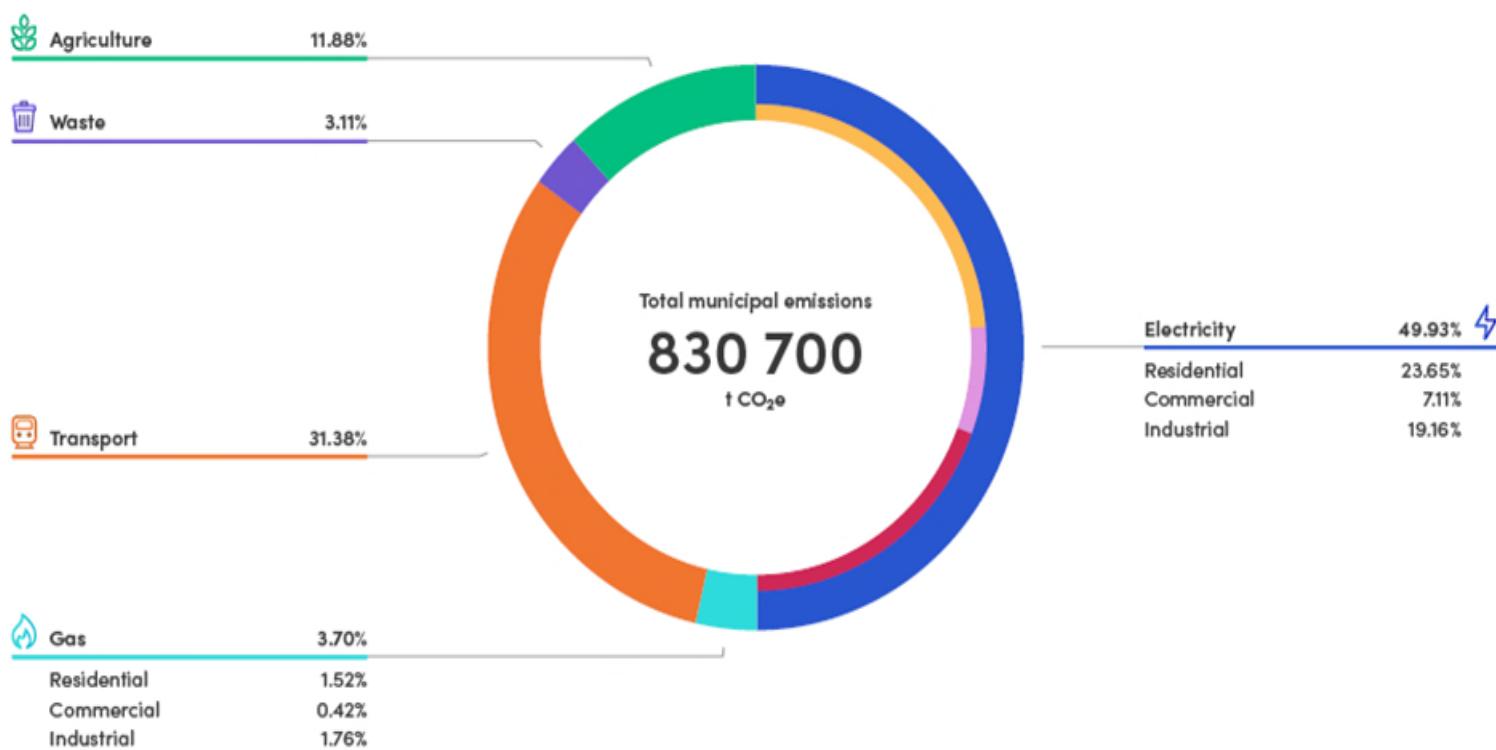


FIGURE 88: COMMUNITY CARBON FOOTPRINT- PERCENTAGE CONTRIBUTION OF EMISSION SOURCES

²⁸ Sourced from: <https://snapshotclimate.com.au/>

PART 4

HOW CLIMATE CHANGE AFFECTS THE REGION

4. HOW CLIMATE CHANGE WILL AFFECT THE REGION

Using data and information from the *CSIRO* and *AdaptNSW*, in the future in a high emissions scenario (no action to reduce emissions) the Queanbeyan-Palerang area will be hotter, have more intense heat waves, and an increasing risk of flash floods, high intensity storms, fire, and drought. In addition, the region will also likely see a decrease in biodiversity, human health and water security issues and land use changes.

Based on long-term (1910–2011) observations, temperatures in the South East and Tablelands Region have been increasing since about 1960, with higher temperatures experienced in recent decades. The region is projected to continue to warm in the near future (2020–2039) and far future (2060–2079), compared to recent years (1990–2009). There will be more hot days and fewer cold nights. The warming projected for the region is large compared to natural variability in temperature.

The South East and Tablelands currently experience considerable rainfall variability across the region and from year-to-year - this variability is also reflected in the projections. However, all the models agree that spring rainfall will decrease in the future.

TABLE 2: PROJECTED CLIMATE CHANGES FOR THE QPRC REGION

		2030:	2060:
		↓	↓
Projected Temperature Changes			
	Maximum temperatures are projected to increase in the near future by 0.5–1.3°C	Maximum temperatures are projected to increase in the far future by 1.5–3°C	
	Minimum temperatures are projected to increase in the near future by 0.4–0.7°C	Minimum temperatures are projected to increase in the far future by 1.4–2.3°C	The number of cold nights will decrease
	The number of hot days are likely to increase with an additional 1–5 days above 35°C projected for the region	The number of hot days are likely to increase with an additional 10–20 days above 35°C projected for the region	
	The duration of warm spells (heat waves) is projected to increase	The duration of warm spells (heat waves) is projected to significantly increase	
Projected Rainfall Changes and Flash Floods			
	Rainfall is projected to decrease in spring and winter and increase in summer and autumn	Rainfall is projected to increase in summer and autumn	
	No change in 1 in 20-year rainfall events	Small increase in the number of 1 in 20-year rainfall events	

**Projected Forest Fire Danger Index (FFDI) changes**

Average fire weather is likely to **increase** in summer and spring

Number of days with severe fire weather is projected to **increase** in summer and spring

**Projected High Intensity Storm changes (including East Coast Lows)**

Frequency of high intensity summer storms are projected to **increase** in the near future. High intensity winter storms are projected to slightly **decrease** in the near future.

**Projected Time Spent in Drought changes**

Time spent in drought is likely **increase** over the course of the century

Data obtained from the CSIRO and Adapt NSW

²⁹ <https://www.climatechangeaustralia.gov.au/en/climate-projections/climate-futures-tool/introduction-climate-futures/>

³⁰ <https://climatechange.environment.nsw.gov.au/>



PART 5

COMMUNITY INPUT

5. COMMUNITY CONSULTATION

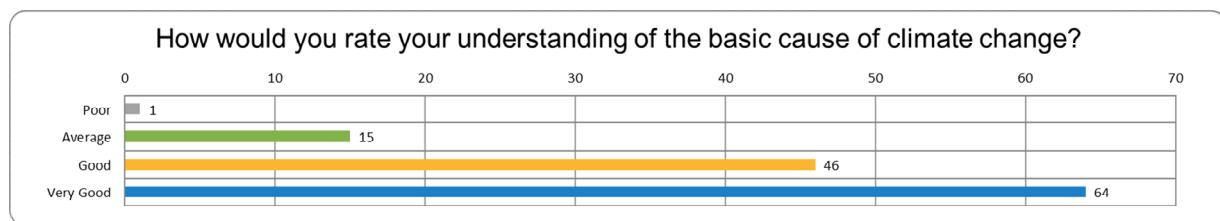
Community consultation for this Climate Change Action Plan consisted of a survey and two workshops that were held in Queanbeyan and Braidwood, in addition to the placement of the draft plan on public exhibition.



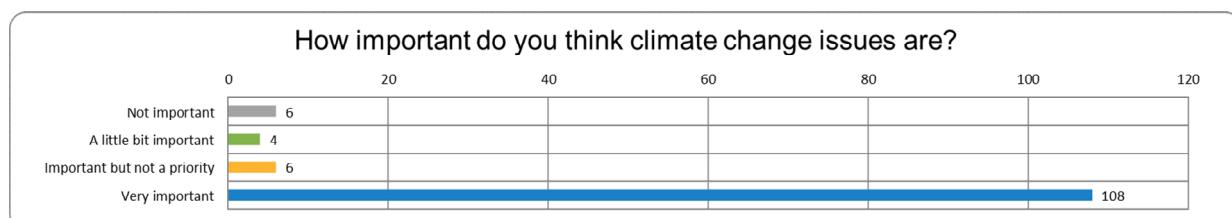
FIGURE 19: COMMUNITY & OTHER INPUTS TO THE DEVELOPMENT OF THE COMMUNITY CLIMATE CHANGE PLAN

5.1. ANALYSIS OF THE SURVEY RESULTS

The community survey was put on Council's 'Have your say webpage for a period of 6 weeks. In total 126 residents filled in the survey. Most respondents have a good or very good understanding of the basic cause of climate change. *Please note the below results do not represent the entire LGA community perspective.



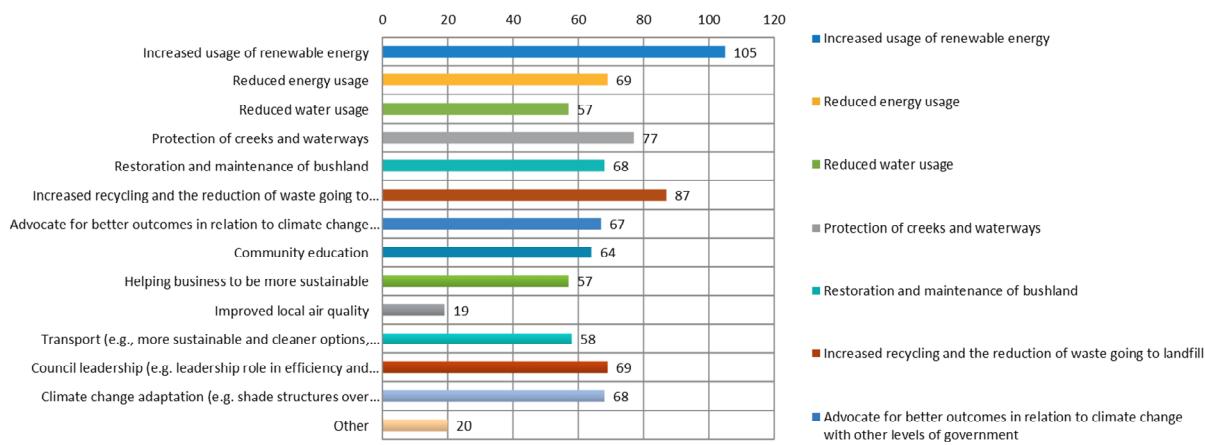
An overwhelming majority of respondents indicated that climate change issues are very important.



Respondents indicated that the most important climate change outcomes Council should prioritise over the next few years are, in order of preference:

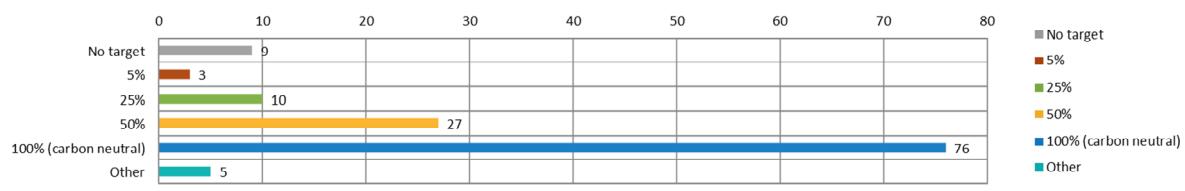
1. Increased usage of renewable energy
2. Increased recycling and the reduction of waste going to landfill
3. Protection of creeks and waterways
4. Reduced energy usage
5. Council leadership
6. Restoration and maintenance of bushland
7. Climate change adaptation
8. Advocate for better outcomes in relation to climate change
9. Community education
10. More sustainable transport
11. Reduced water usage
12. Helping business to be more sustainable
13. Improved local air quality

What are the most important climate change outcomes Council should prioritise over the next few years?



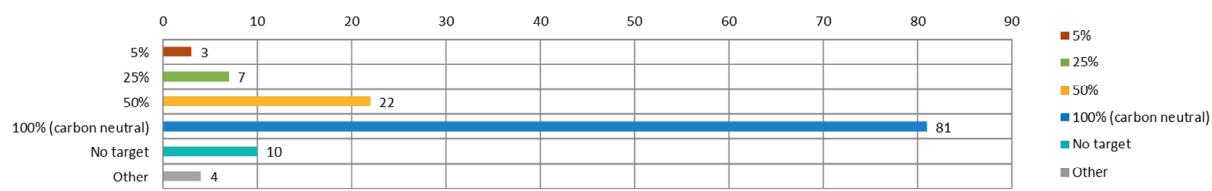
According to survey participants, the most preferred GHG's reduction target for the community was carbon (GHG) neutrality, followed by 50% carbon (GHG) reduction.

What greenhouse gas reduction target should the community aim for?



According to survey participants, the most preferred GHG's reduction target for council operations was carbon (GHG) neutrality, followed by 50% carbon (GHG) reduction.

What greenhouse gas reduction target should Council aim for its operations?



5.2. COMMUNITY CONSULTATION WORKSHOPS

Two workshops were held in Queanbeyan and Braidwood in April 2019 to seek community input into the development of this plan. Following a presentation about the community's carbon footprint, workshop participants were asked to provide their recommendations and suggestions for action on posters. Examples of these posters can be seen in the picture below.

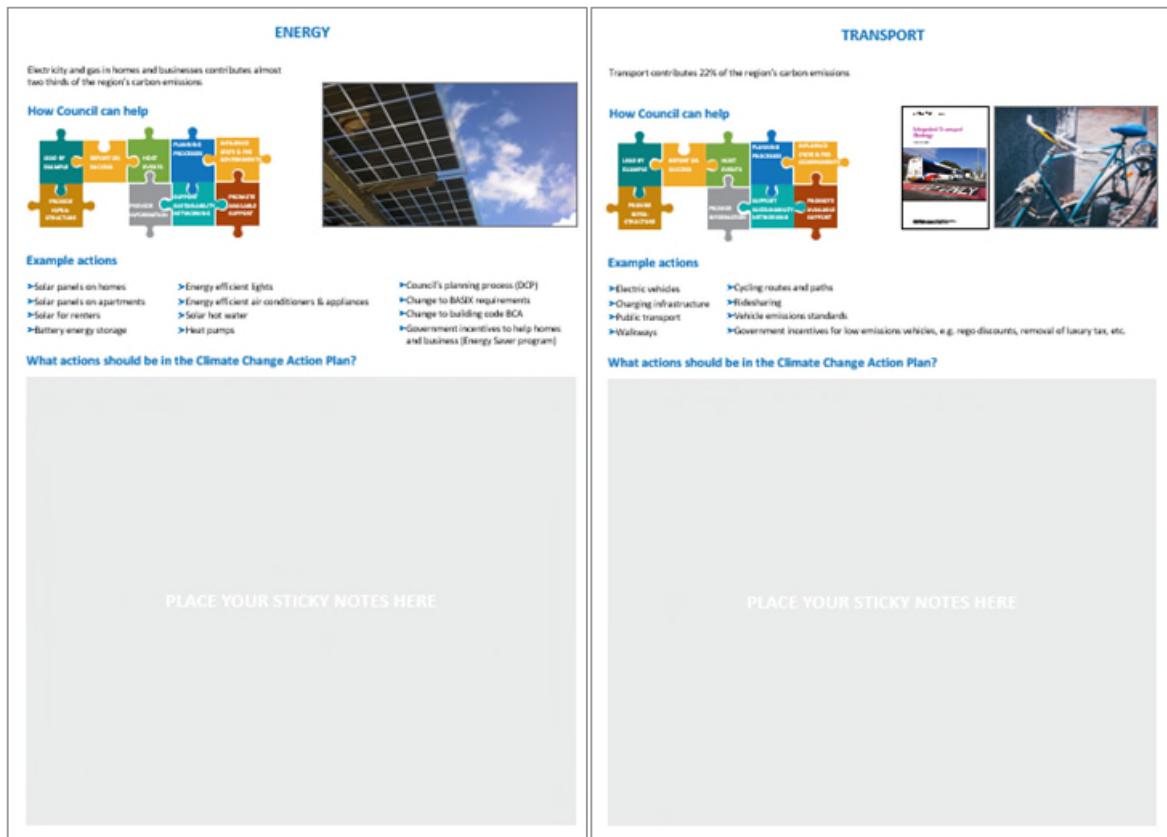


FIGURE 20: EXAMPLES OF POSTERS USED AT THE WORKSHOPS

In the two workshops, participants were also asked to provide feedback on recommended targets both for Council operations and the community.

5.2.1. COUNCIL TARGETS IDENTIFIED BY WORKSHOP PARTICIPANTS

Most workshop participants wanted to see a council target achieved no later than 2025. There was no clear preference for whether the Council target should be on either renewable energy or carbon (GHG) emissions. Most workshop participants wanted Council to adopt an ambitious target.

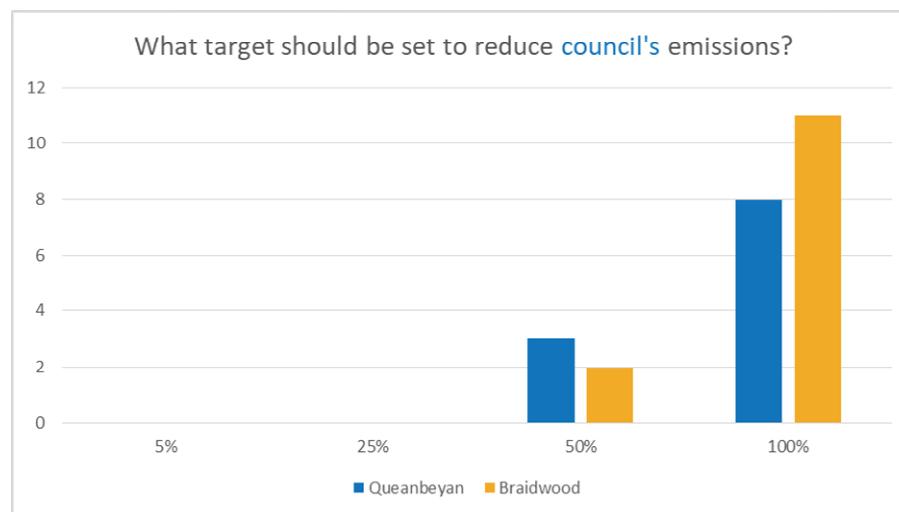
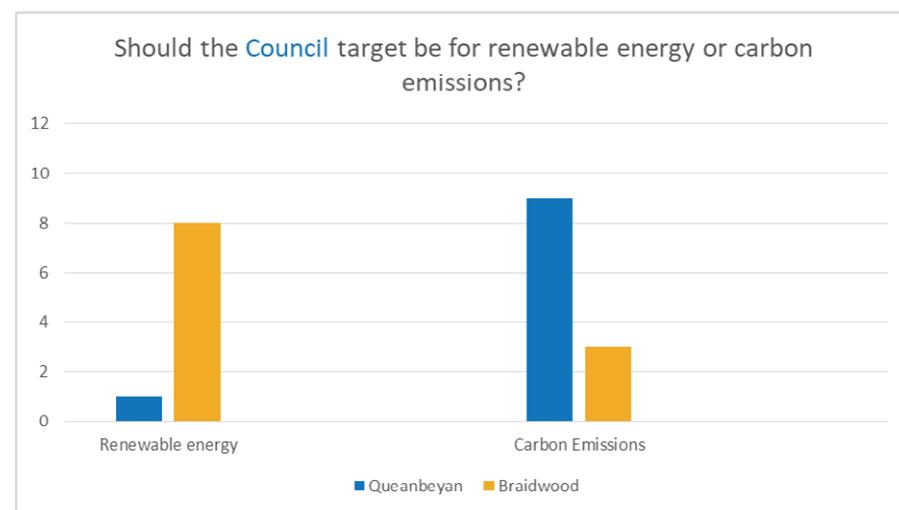
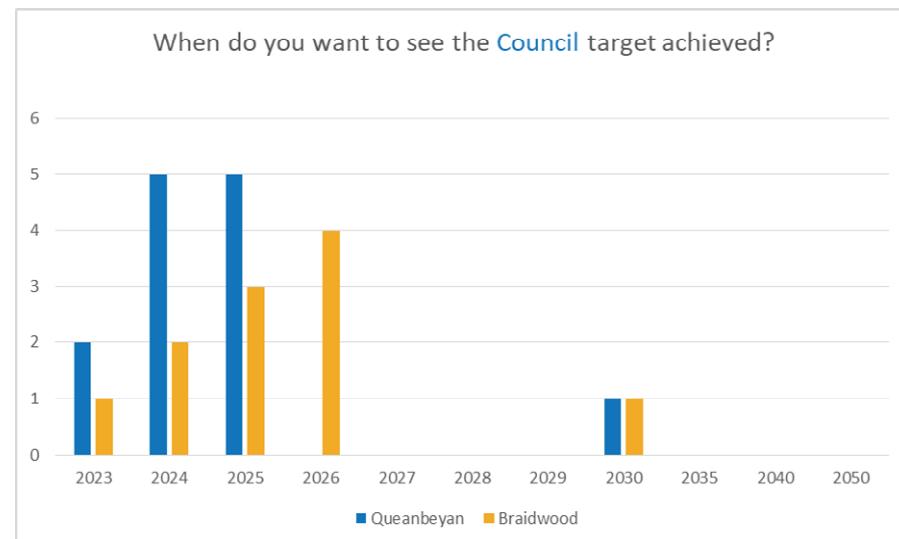


FIGURE 21: COMMUNITY WORKSHOPS – RECOMMENDATIONS FOR COUNCIL OPERATIONS TARGETS

5.2.2. COMMUNITY TARGETS IDENTIFIED BY WORKSHOP PARTICIPANTS

Most workshop participants want to see a community target achieved no later than 2030. There was no clear preference whether the community target should be on either renewable energy or carbon (GHG) emissions. Most workshop participants wanted the community to adopt an ambitious target.

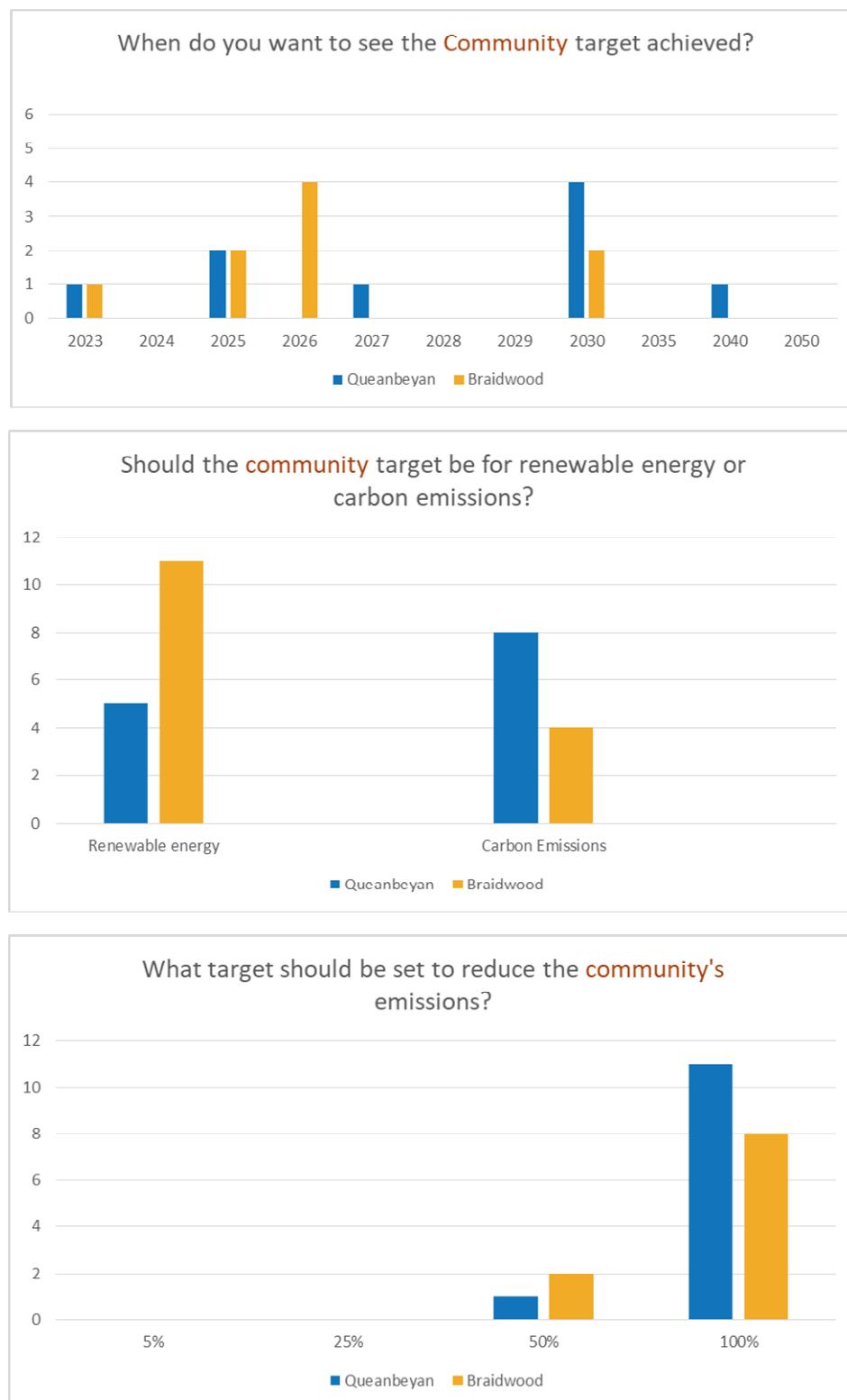


FIGURE 229: COMMUNITY WORKSHOPS – RECOMMENDATIONS FOR LGA TARGETS

5.3. PUBLIC EXHIBITION

Following the public exhibition period (December 2019-March 2020), the online data analysis indicates that a total of 918 visits occurred on the ‘Your Voice-QPRC Climate Change Action Plans’ webpage with 586 visitors downloading the documents. Of these visitors, 41 participants responded to survey questions shown below. Most participants live in Queanbeyan-Palerang and were mostly from Queanbeyan, Bungendore, and Braidwood.

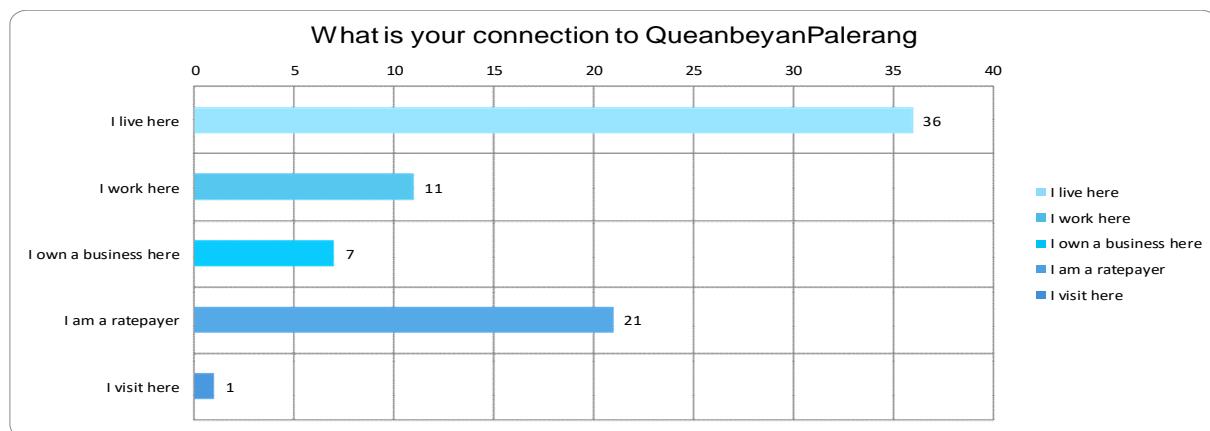


FIGURE 23: PUBLIC EXHIBITION – CONNECTION TO QUEANBEYAN-PALERANG

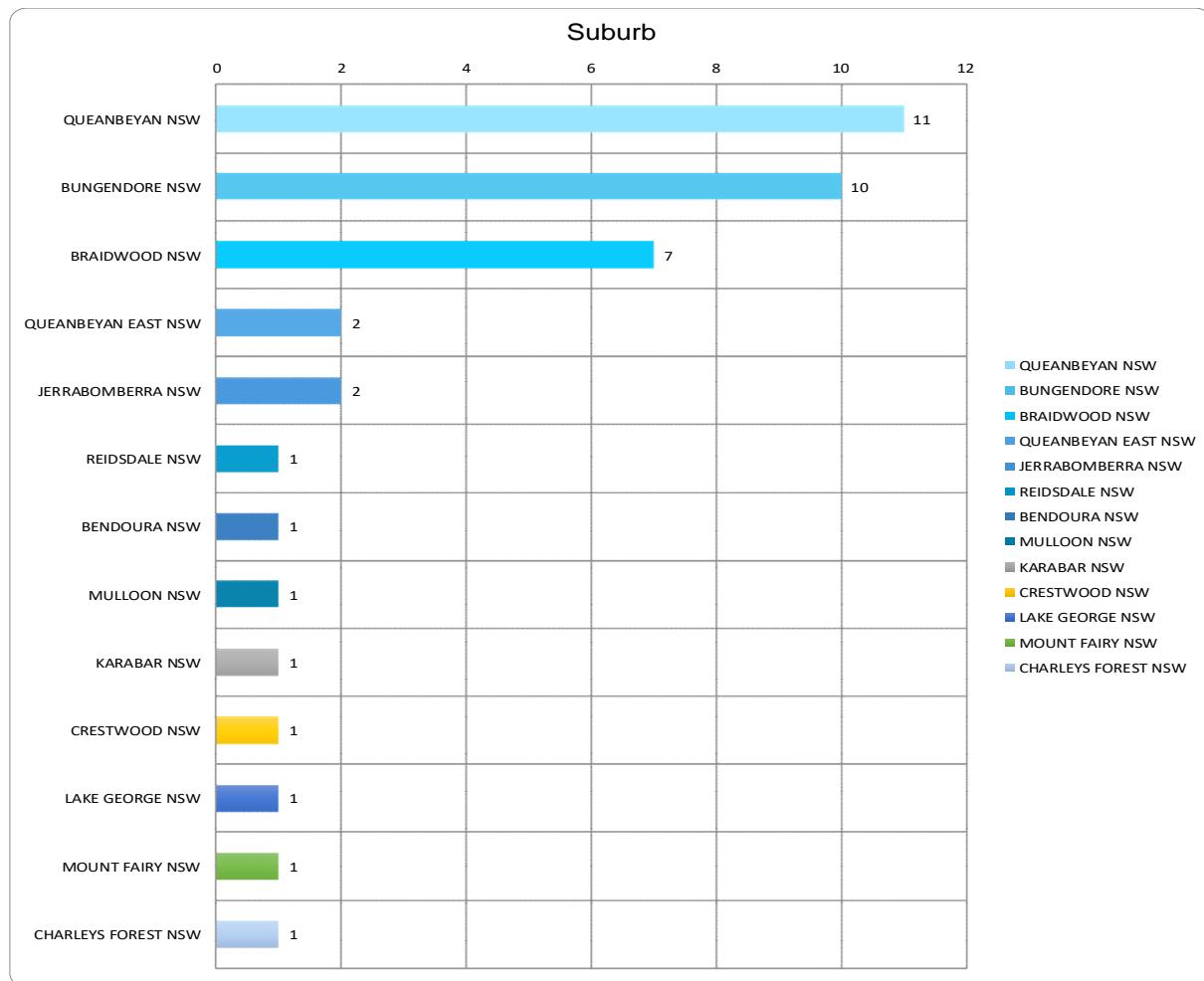


FIGURE 10: PUBLIC EXHIBITION – LOCATIONS OF RESPONDENTS

During the course of public exhibition Council received a total of 32 written submissions and 40 'Your Voice' comments from the community and Council staff on the Community Climate Change Action Plan and the Council Operations Climate Change Action Plan. The majority of respondents indicated that they are in support of the plans proposed, with 60% indicating that they would like to see ambitious action taken by Council. The results of the responses are summarised below.

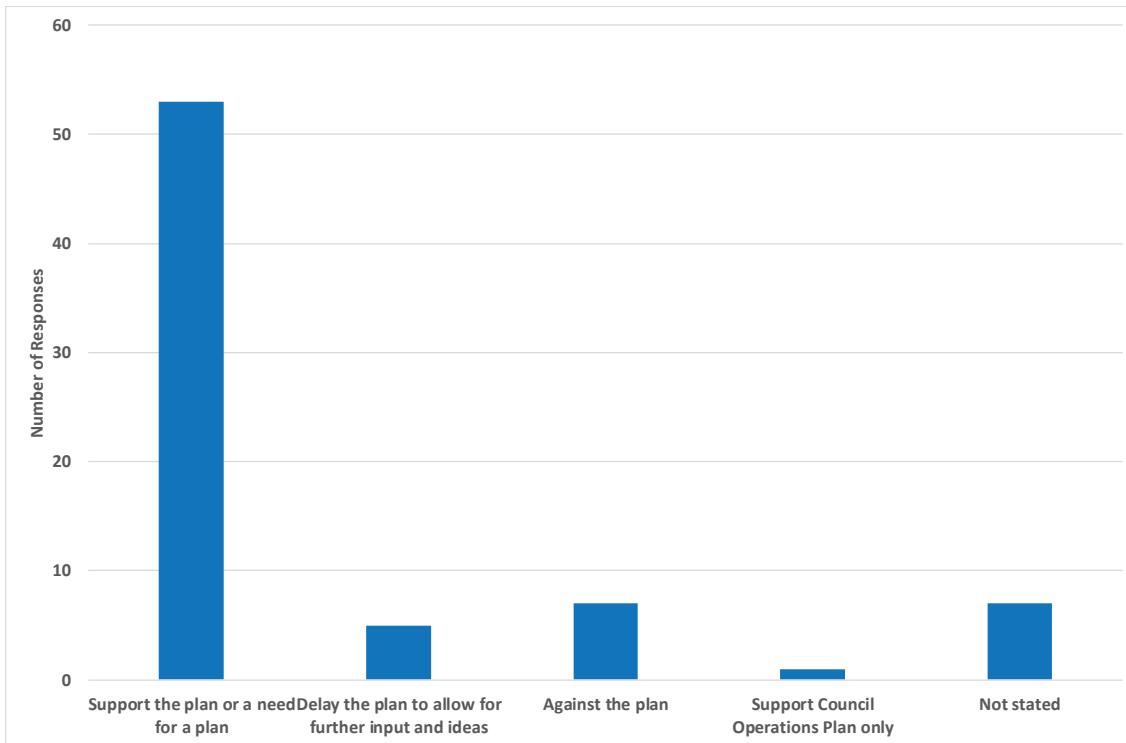


FIGURE 25: PUBLIC EXHIBITION RESPONSE TO THE ACTION PLANS

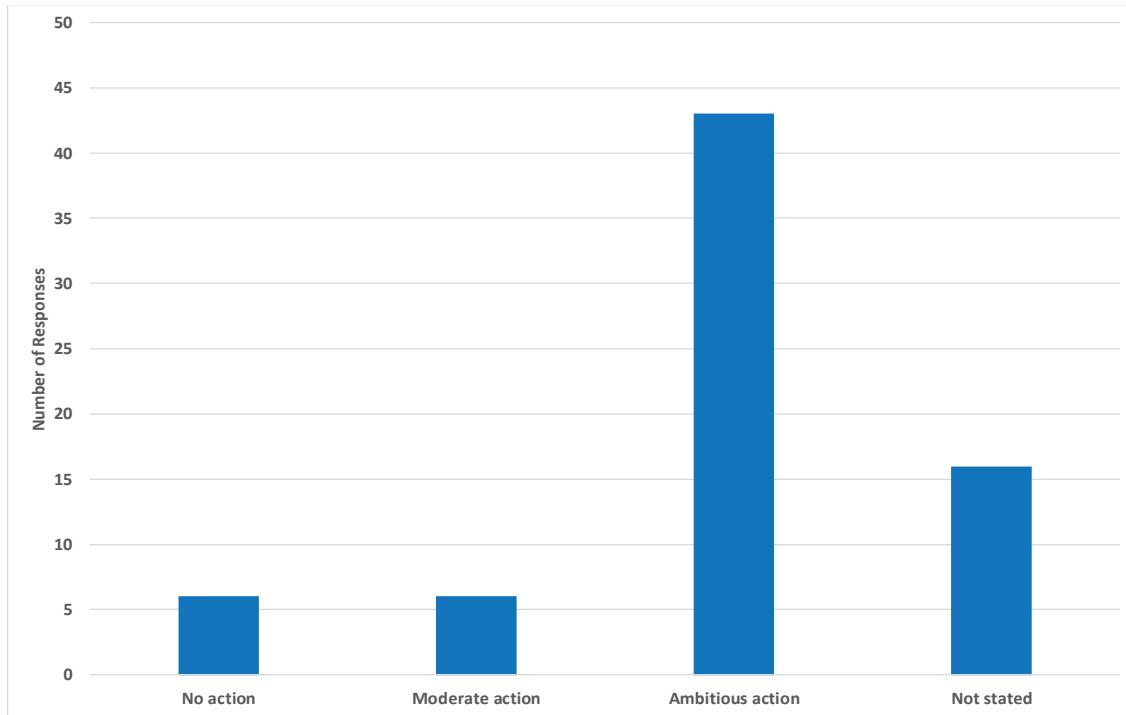


FIGURE 26: PUBLIC EXHIBITION RESPONSE TO THE LEVEL OF ACTION THEY WOULD LIKE TO SEE FROM COUNCIL

Of the submissions and comments that were received by Council, 15 of the top suggested changes or key comments are highlighted in Table 3 below. Some of these comments call for the following:

- Exploring actions that:
 - incorporate carbon sequestration and sinks
 - address water supply and conservation issues
 - accelerate the implementation of light rail, better bus services, and active transport options
- Greater focus on evacuation plans for extreme weather events focusing on air and water contamination, mental health and fuel shortages.
- Establishing an urban tree canopy target and planting more trees in urban settings to mitigate the effects of heat islands in a warming world.
- Assistance from Council to implement microgrids, community renewable energy and storage projects, and support for sustainability-focused local community groups.

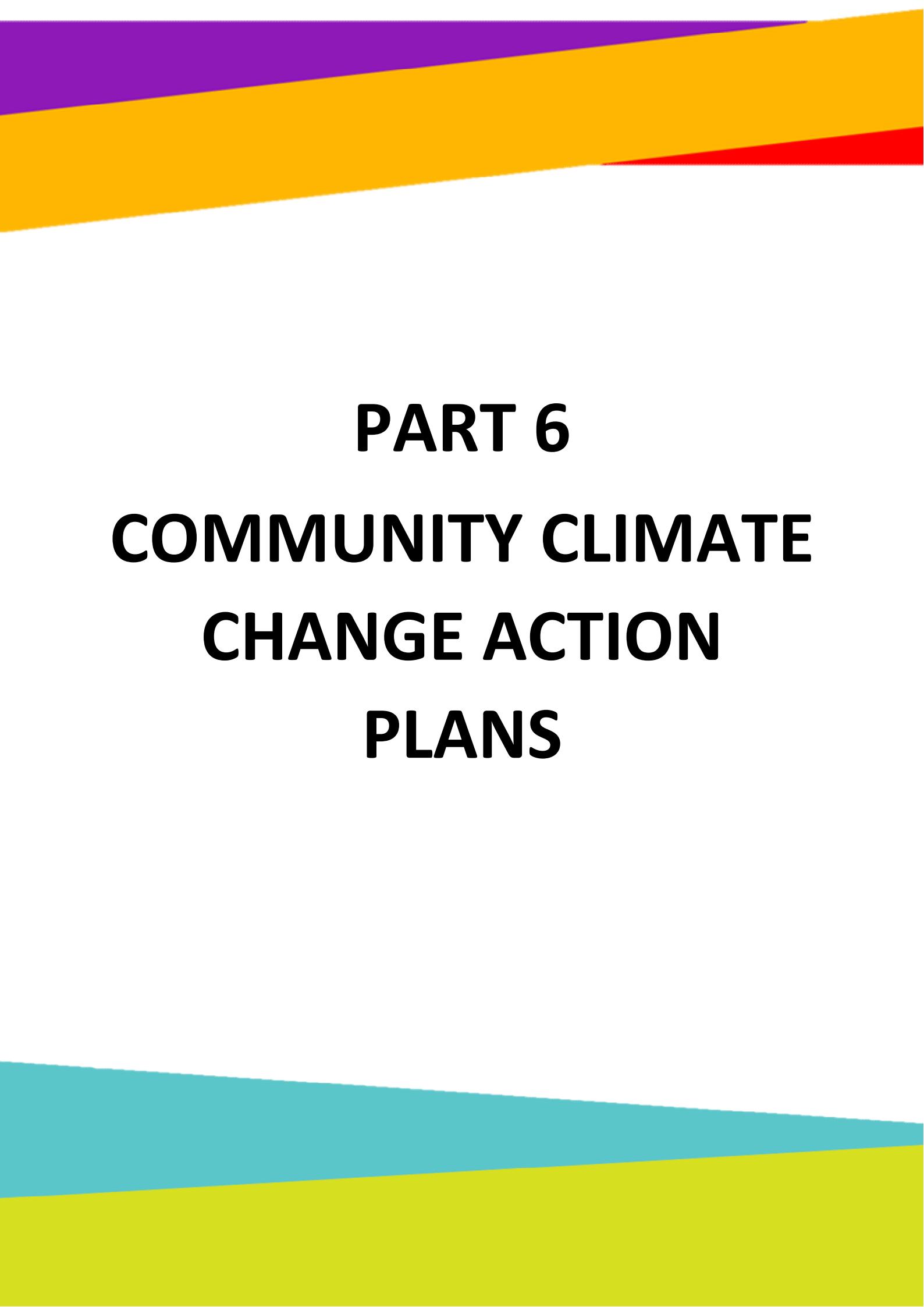
A complete list of suggested changes or key comments can be found in Appendix B

TABLE 3: TOP 15 SUGGESTED CHANGES OR KEY COMMENTS FROM THE PUBLIC EXHIBITION

Top responses from public exhibition
Explore further actions within the plans with regards to carbon sequestration and sinks
Incorporate community emission reduction targets
More actions to address water supply and conservation issues in Braidwood and Bungendore
Evacuation plans and information for communities with regards to extreme weather events. Including information on dealing with air and water contamination, mental health + fuel shortages
Community Action Plan seems to highlight that Council staff are doing everything – there needs to be more community-based actions
Accelerate actions within the integrated transport management plan for example light rail, better bus services (especially Braidwood)
Facilitate active transport options – walking and cycling (comment: still a huge issue within Queanbeyan)
Microgrids/or other community renewable energy projects and storage - need more support and direction from Council, including funding. This may include regulatory and commercial support
Establish an urban tree canopy target and plant more trees in urban settings to mitigate the effects of heat islands in a warming world
Strengthen DCP requirements on renewable energy, energy efficiency and water conservation
Full or more rebate opportunities from Council
Support or fund 'climate' or 'sustainable' local community groups – this could be as little as providing rooms for meetings
Please include annual reporting of emissions/actions undertaken as a set action
There is no prioritisation of the actions (suggest a time frame instead)
Increase emission reduction target to 90%-100% by 2030 for Council Operations

Along with the above responses, several key phrases from the community are presented below.

- *Transitions are manageable when the return / impact is well communicated. Awareness of climate impact and adversity across our community is high from our horror summer experiences. The community acceptance I expect would be high if the Council showed strong leadership on transitions to low energy strategies.*
- *This is a very comprehensive and encouraging Plan. Council are to be congratulated on formulating it. I look forward to the implementation.*
- *The past Summer has shown us what the future for us is going to be like. Water restrictions in Bungendore and Braidwood plus other effects of severe drought have been very damaging to the residents of our region. The fires have shown us how vulnerable we are to severe weather events which are the result of climate change.*
- *Strong action on climate change by Council would give the next generation of farmers and local residents confidence to remain in the region and make their lives here.*
- *As a young person in the local community, it is evident that climate change and the issues accompanying it are held at the utmost importance within my generation. I believe the change has to come from a local and individual level. I believe it is very important to adopt the ambitious targets especially as they are affordable and achievable benefiting all within the local community.*
- *Carry out more environmental projects within the local area that sequester carbon. This would include assisting local landowners who own land considered environmentally important to mitigating climate change (much like Greening Australia does). This could also include participating in carbon projects that earn QPRC additional revenue from the federal Clean Energy Reduction Fund.*
- *Local and state governments can and must play a leadership role as part of the growing global movement of communities and state and local jurisdictions to reduce greenhouse gas emissions, and it is good to see the importance of leadership mentioned in the draft CCCAP.*
- *There is also a risk in relying on the 'greening' of the grid to achieve emission cuts compared to growth projections, as the council plan appears to do for its more ambitious emissions reduction target. Risks relate to external factors over which the council will have no control.*
- *I also believe this represents an excellent opportunity for strong action and leadership, in an uncertain time when the community is looking to you for both of these things. Recent events with fire, drought and heat have caused much anxiety amongst our families, business owners, and the wider community.*
- *Street trees are proven to have significant cooling effects, are aesthetically pleasing, increase value and have a positive mental health impact.*
- *I am not opposed to Council making carbon-reduction decisions where the economical business case supports them. LED street lighting and solar PV power for council facilities appear to be examples of sound business cases. Battery storage is not a good example, and is completely inadequate in residences with electric heating.*



PART 6

COMMUNITY CLIMATE

CHANGE ACTION

PLANS

6. COMMUNITY CLIMATE CHANGE ACTION PLANS

The actions listed below are specific ongoing responsibilities and tasks Council will undertake to support the community in taking the actions described in the action plans. Appendix A provides further data and information about potential GHG emissions abatement actions in the community, focused on areas where emissions are highest, such as stationary energy and transport.

Council will:

- Lead by example and improve the sustainability of Council operations
- Report annually to the community on Council and the community's progress against the Climate Change Action Plans
- Host events to educate and engage the community around climate change and sustainability
- Continue to monitor community emissions with the help of the NSW Government
- Communicate information on climate change issues more regularly through the newspaper, City Life publication, website etc. and have climate change and sustainability information at the front desk and in the library
- Support sustainability networking – through mailing lists, events, and providing meeting rooms for community groups at community rates
- Promote and inform the community about government grants available and energy saving and other education services

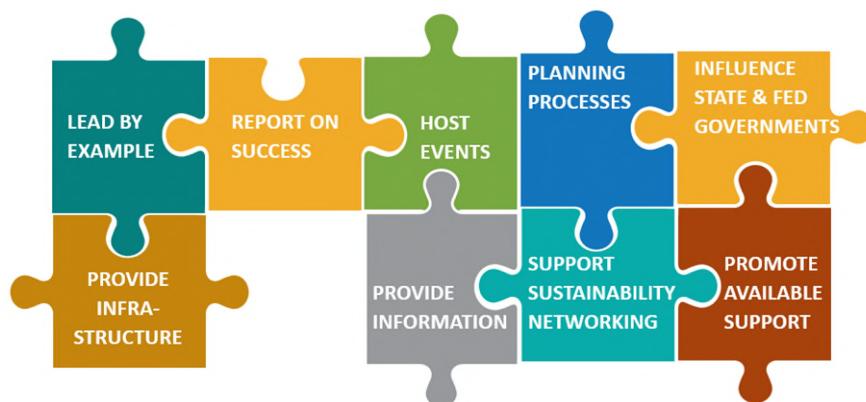


FIGURE 27: EXAMPLES OF HOW COUNCIL CAN SUPPORT THE COMMUNITY

Timeframes Key



Short Term: consider as soon as possible



Medium Term: consideration in 2-5 years time



Long Term: consideration in 6-10 years time



Ongoing: consideration throughout the duration of the Plan

6.1. ENERGY ACTION PLAN

TABLE 4: ACTION PLAN – ENERGY

Energy Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.1.1	Education	Encourage the community to be more energy efficient	O	Council	Council resourcing – staff allocation: ➢ Education ➢ Advice ➢ Promotion of relevant information	Fewer GHG emissions in the community
CU 6.1.2	Education	Provide up-to-date information on how emissions can be reduced in the community	O	Council	Council resourcing – staff allocation: ➢ Education ➢ Advice ➢ Promotion of relevant information	Fewer GHG emissions in the community, higher energy literacy
CU 6.1.3	Renewable energy	Investigate how council can support community energy projects for example microgrids or community battery storage systems	S	Council	Council resourcing – staff allocation	Fewer GHG emissions in the community, increased energy independence
CU 6.1.4	Education	Encourage the community to install solar PV and help address current barriers for renters and strata dwellings	O	Council	Council resourcing – staff allocation: ➢ Education ➢ Advice ➢ Promotion of relevant information	More renewable energy and fewer GHG emissions in the community

Energy Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.1.5	Education	Provide information to residents about available support programs offered by the state and federal governments	O	Council	Council resourcing – staff allocation: ➢ Education ➢ Advice ➢ Promotion of relevant information	Fewer GHG emissions in the community
CU 6.1.6	Incentives & rebates	Encourage or help to provide energy audits for households and business to help reduce emissions	O	Community expertise OR Council	• Community involvement and associated time • Grant funding (for Community or Council facilitation)	Fewer GHG emissions in the community
CU 6.1.7	Renewable energy	Investigate opportunities for Council and the community to collaborate on a local renewable energy project as they arise	M	Community & Council	• Community Involvement and associated time • Council resourcing – staff allocation	Fewer GHG emissions in the community, increased energy independence, economic benefits for the region
CU 6.1.8	Renewable energy	Investigate bulk buys for solar PV and solar hot water for the community	M	Community groups OR Council	• Community involvement and associated time • Council resourcing – staff allocation	Fewer GHG emissions in the community, increased energy independence
CU 6.1.9	Self-sufficiency	Investigate the opportunity of a microgrid development in the community	M	Community	• Grant funding • Investment opportunity	Fewer GHG emissions in the community, increased energy independence
CU 6.1.10	Collaborate with other local governments	Work with the ACT and other local councils to develop a regional partnership to reduce GHG emissions	M	Council & CRJO	Council resourcing – staff allocation	Efficiencies and potential cost reduction of measures through collaboration. Increased momentum for emissions reduction.

6.2. TRANSPORT ACTION PLAN

TABLE 5: ACTION PLAN – TRANSPORT

Transport Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.2.1	Advocacy	Lobby for grants / incentives for low to zero emission vehicles	O	Community & Council	Community and Council advocacy	Fewer GHG emissions. Less noise
CU 6.2.2	EVs/charging stations	Facilitate installation of electric car recharging points	S	Council	<ul style="list-style-type: none"> •Council resourcing – staff allocation •Support and work with third party installers 	Fewer GHG emissions. Less noise
CU 6.2.3	Active transport	Support community bikes or other active transport means	O	Community	<ul style="list-style-type: none"> •Community facilitation •Council advocacy 	Health benefits. Fewer GHG emissions
CU 6.2.4	Cycling	Increase permanent bike racks and maintenance stations throughout the LGA	S	Council	Council or grant funding	Health benefits. Fewer GHG emissions
CU 6.2.5	Cycling	Increase walking and bike paths in the community and improve existing ones	O	Council	Council or grant funding	Health benefits. Fewer GHG emissions
CU 6.2.6	Cycling	Encourage businesses to support cycling for their employees	L	Local businesses & Council	<ul style="list-style-type: none"> •Business facilitation and Council advocacy •Council resourcing – staff allocation: <ul style="list-style-type: none"> >Education >Advice 	Health benefits. Fewer GHG emissions

Transport Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.2.7	Education	Educate the community around cycle awareness	M	Council	Council resourcing – staff allocation: ➢ Education ➢ Advice ➢ Promotion of relevant information	Health benefits. Fewer GHG emissions
CU 6.2.8	Education	Encourage the community to walk more, use buses and carpool	O	Council	Council resourcing – staff allocation: ➢ Education ➢ Advice ➢ Promotion of relevant information	Health benefits. Fewer GHG emissions
CU 6.2.9	Public transport	Provide better local & inter-city bus services	M	Community & Council	Community and Council advocacy	Fewer GHG emissions
CU 6.2.10	Public transport	Provide Park & Ride and Bike & Ride facilities	O	Council	Council or grant funding	Fewer GHG emissions
CU 6.2.11	Public transport	Subsidise bus service between Braidwood and Canberra	L	Council	Council or grant funding	Fewer GHG emissions
CU 6.2.12	Decreased transport needs	Investigate the opportunity of increased population density of the Queanbeyan city centre to lower transport needs and invigorate the city centre	L	Council	Council resourcing – staff allocation	Fewer GHG emissions

Transport Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.2.13	Decreased greenhouse gas emissions	Advocate for frequent low to zero emission buses to lower car usage	O	Community & Council	Community and Council advocacy	Fewer GHG emissions. Less noise
CU 6.2.14	Incentives & rebates	Advocate for incentives for low to zero emission vehicle users	O	Community & Council	Community and Council advocacy	Fewer GHG emissions. Less noise
CU 6.2.15	Public transport	Advocate for extending Canberra light rail to Queanbeyan	O	Community & Council	Community and Council advocacy	Fewer GHG emissions
CU 6.2.16	Decreased transport needs	Investigate opportunities for community smart – hubs to reduce transportation needs when travelling into work, school, university etc.	M	Council	Council or grant funding	Fewer GHG emissions. Reduced congestion

6.3. WASTE ACTION PLAN

Actions on waste are highlighted from the community engagement for the Community Climate Change Action Plan. It is noted that Council's Waste Strategy will be the primary document that sets out key actions. Accordingly only recommendations from the community are recorded here.

TABLE 6: ACTION PLAN – WASTE

Waste Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.3.1	Education	Continue to educate the community on waste avoidance strategies such as recycling, composting and worm farming	O	Council	Council resourcing – staff allocation: ➢ Education ➢ Advice ➢ Promotion of relevant information	Less waste. Fewer GHG emissions from waste. Circular economy
CU 6.3.2	Education	Encourage local businesses to facilitate circular economy practices by reusing waste and recycling streams	O	Local businesses & Council	• Business facilitation and Council advocacy • Council resourcing – staff allocation: ➢ Education ➢ Advice	Less waste. Fewer GHG emissions from waste. Circular economy
CU 6.3.3	Shared facility	Provide re-use centres or repair cafés across the LGA	M	Community OR Council	• Community involvement and associated time • Council or grant funding	Less waste. Fewer GHG emissions from waste. Circular economy
CU 6.3.4	Self-sufficiency	Use and support local produce where possible	O	Community & Council	• Promotion of local produce • Community and Council advocacy	Less waste. Fewer emissions from waste. More community cohesion. Increased knowledge on local produce
CU 6.3.5	Waste management	Reduce usage of single use plastics	O	Community & Council	Community and Council facilitation	Fewer emissions from production of plastic bags and bottles. Fewer emissions from plastic waste. Less leachate. Reduced danger to fauna

Please note that Council's Integrated Water Cycle Management Plan - will be the primary document that sets out key water security and conservation actions.

6.4. WATER ACTION PLAN

TABLE 7: ACTION PLAN – WATER

Water Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.4.1	Education	Review Council's 'Waterwise' program and incentives and investigate new opportunities to reduce water consumption and spend	S	Council	Council resourcing – staff allocation	Less costs for households. Fewer emissions from treatment of water.
CU 6.4.2	Education	Provide workshops on sustainable gardening	M	Community expertise OR Council	<ul style="list-style-type: none"> •Community involvement and associated time •Council or grant funding 	More knowledge in the community of how to live and garden more sustainably. Fewer GHG emissions. Improved resilience.
CU 6.4.3	Alternative water supply	Encourage the community to install potable water harvesting systems for example water tanks or water bladders	O	Council	Council resourcing – staff allocation	More self-sufficiency. Less town water consumption. Fewer emissions from treatment of water. Council can be a national leader and facilitator in 'new' water harvesting systems.
CU 6.4.4	Development controls	Continue to ensure new developments are water efficient *under Basix requirements	O	Council	Council resourcing – staff allocation	More self-sufficiency. Less town water consumption. Fewer emissions from treatment of water. Council can be a national leader and facilitator in 'new' water harvesting systems.

6.5. NATURAL & URBAN ENVIRONMENT ACTION PLAN

TABLE 8: ACTION PLAN – NATURAL & URBAN ENVIRONMENT

Natural & Urban Environment Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.5.1	Environmental management	Research methods to save historic trees	L	Community groups & Council	<ul style="list-style-type: none"> Community involvement and associated time Council resourcing – staff allocation 	More habitat, shelter and food sources for wildlife. Carbon sequestration (storage)
CU 6.5.2	Biodiversity	Establish a community and Council tree canopy target which allows Council and the community to work together on increasing the local tree canopy	S	Community & Council	<p>Council resourcing – staff allocation:</p> <p>>Establishing target</p>	Provides more habitat for animals. Carbon sequestration (storage)
CU 6.5.3	Advocacy	Lobby state and federal governments to increase biodiversity support under a changing climate	O	Community & Council	Community and Council advocacy	More support for biodiversity under climate change conditions from state and federal governments
CU 6.5.4	Recycled water	Investigate increased usage of recycled water when watering or planting trees throughout the LGA	M	Community & Council	<ul style="list-style-type: none"> Council or grant funding Community involvement and associated time 	Reduced potable water consumption
CU 6.5.5	Biodiversity	Conserve established wildlife corridors and establish new wildlife corridors (where appropriate) in addition to planting more vegetation to store carbon	O	Community & Council	<ul style="list-style-type: none"> Council or grant funding Community involvement and associated time 	Allow wildlife to freely move across a larger area. Carbon sequestration (storage)
CU 6.5.6	Carbon sequestration	Investigate opportunities for carbon sequestration for example planting more trees, biochar or carbon farming	M	Community	<ul style="list-style-type: none"> Community involvement and associated time Council advocacy 	Remove GHGs from the atmosphere, mitigate effects of climate change
CU 6.5.7	Carbon sequestration	Investigate opportunities to reduce and store GHG emissions in rural and agricultural properties	M	Community	<ul style="list-style-type: none"> Community involvement and associated time Council advocacy 	Remove GHGs from the atmosphere, mitigate effects of climate change

6.6. CLIMATE CHANGE ADAPTATION ACTION PLAN

TABLE 9: ACTION PLAN – CLIMATE CHANGE ADAPTATION

Adaptation Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.6.1	Drought & Bushfires	Create lists of trees and community plant types that can: grow in poor soils, are less flammable, drought tolerant and future climate ready. Support local plant nurseries for growing such trees and vegetation	S	Council	Council resourcing – staff allocation: >Education >Advice >Promotion of relevant information	Maintains and increases tree cover. Drought tolerance. Bushfire mitigation and adaptation. Less water consumption
CU 6.6.2	Drought & Bushfires	Increase uptake of drought-resistant, climate ready and less flammable vegetation types within residential gardens	S	Community	Community involvement and associated time	Maintains and increases tree cover. Drought tolerance. Bushfire mitigation and adaptation. Less water consumption
CU 6.6.3	Education	Hold or support workshops that help rural and agricultural property owners with drought-proofing their farming	M	Community & Council	•Community involvement and associated time •Council resourcing – staff allocation	Maintaining or increasing yields for farmers under future climate conditions. Less financial stress
CU 6.6.4	Extreme heat	Provide more water bubblers and water refill stations across the LGA	M	Council	Council or grant funding	Supporting the community with extreme heat days. Reduced potential for heat stress
CU 6.6.5	Resilience	Develop resilience indicators and gather data	S	Council	Council resourcing – staff allocation: >Developing indicators >Gather data	Improved management of community resilience
CU 6.6.6	Extreme heat	Develop a heatwave response plan aligned with the NSW state Heatwave plan	M	Government agencies & Council	Council resourcing – staff allocation: >Developing plan	Improved planning for extreme heat days. Reduced potential for heat stress

Adaptation Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.6.7	Flooding	Review capacity of drains to cope with flooding	L	Council	Council resourcing – staff allocation	Reduce potential for local flooding. Improved safety on roads
CU 6.6.8	Evacuation planning	Map key sites of particular vulnerability, e.g. the Queanbeyan River floodplain and overlay with location of evacuation centres. Ensure business continuity planning	M	Council	Council resourcing – staff allocation	Improved safety and evacuation for the community
CU 6.6.9	Continuity of water & sewerage treatment	Council to ensure business continuity is well planned for. Pre-deployment of backup generators prior to extreme weather	O	Essential service providers & Council	Council resourcing – staff allocation	Continuity of water supply and functioning sewage system for the community during power outages
CU 6.6.10	Extreme heat	Increase the planting of tall native and deciduous fire retardant trees in urban areas for shade and cooling.	S	Community & Council	<ul style="list-style-type: none"> • Community involvement and associated time • Council or grant funding 	More shade for the community during extreme heat days. Creates cooler cities
CU 6.6.11	Extreme heat	Increase urban vegetation/forests to reduce heat island effects <i>*Preferably less flammable vegetation</i>	S	Community & Council	<ul style="list-style-type: none"> • Community involvement and associated time • Council or grant funding 	More shade for the community during extreme heat days. Creates cooler cities
CU 6.6.12	Extreme heat	Provide more versatile shade structures	S	Council	Council or grant funding	Increased shade for the community during extreme heat days
CU 6.6.13	Resilience	Educate & map what is produced in the QPRC LGA to meet local and growing needs	M	Council	<p>Council resourcing – staff allocation:</p> <ul style="list-style-type: none"> >Education >Advice >Promotion of relevant information 	Self-sufficiency – less dependence on external food supplies

Adaptation Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.6.14	Resilience	Update construction works technical specifications. Factor climate change adaptation into design and materials selection	M	Community & Council	<ul style="list-style-type: none"> Community involvement and associated time Council resourcing – staff allocation 	Improved structures to cope better in a changing climate
CU 6.6.15	Resilience	Work with the community to put in place agreements for the prioritisation of generators, or to be reconnected to the grid after extreme weather events	M	Community & Council	<ul style="list-style-type: none"> Community involvement and associated time Council resourcing – staff allocation 	Access to power after extreme weather events. Energy independence, fewer GHG emissions in the community if backup power is renewable
CU 6.6.16	Resilience	Investigate the opportunity of renewable energy with battery storage for key infrastructure	L	Essential service providers & Council	Council or grant funding	Access to power after extreme weather events. Fewer GHG emissions
CU 6.6.17	Resilience	Telecommunications are increasingly reliant on power supply. Council to retain and keep active communication networks across council and the community for alternative communications under emergency conditions	M	Essential service providers & Council	Council resourcing – staff allocation	Ability to communicate during extreme weather events
CU 6.6.18	Resilience	Council to work with essential services owners that are highly dependent on power like retirement villages, aged care, traffic lights, supermarkets to ensure business continuity planning is in place.	M	Essential service providers & Council	Council resourcing – staff allocation	Essential services will continue to work during power outages ensuring the safety of the community
CU 6.6.19	Resilience	Community led preparedness programs, including enabling community led solutions. Support the NSW government in the facilitation of their workshops	M	Community expertise & Council	<ul style="list-style-type: none"> Community involvement and associated time Council resourcing – staff advocacy 	Improved preparedness for extreme weather events. A safer community
CU 6.6.20	Resilience	Develop a plan for cleaning up actions after extreme weather events, with specific attention to asbestos and green waste disposal	L	Council	Council resourcing – staff allocation: >Developing plan	Improved preparedness for extreme weather events. A safer community

Adaptation Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.6.21	Evacuation planning	Review current evacuation plans with other government departments and emergency services. Improve communication of evacuation plans with the community	M	Government agencies, emergency services & Council	Council resourcing – staff allocation: ➢Reviewing plans ➢Education plan ➢Communication of relevant information	Improved evacuation planning and communication- allowing communities to exit the area under evacuation scenarios
CU 6.6.22	Environmental impacts	Develop an environmental impact plan. Multiple extreme weather can exacerbate background environmental impacts like soil erosion and water quality – drought followed by fire followed by extreme rain increases runoff and changes water conditions like pH, suspended solids, etc.	M	Council	Council resourcing – staff allocation: ➢Developing plan	Better managed environmental impacts following extreme weather.
CU 6.6.23	Development	Utilise climate resilient home designs for example light coloured roofs, passive heating and cooling, wide eaves and good drainage	O	Community	• Community involvement and associated time • Council advocacy	Reduced heat stress during summer and warmer houses in winter. Mitigation against climate change
CU 6.6.24	Development	Adopt energy and water efficient home designs and/or undertake retrofitting	O	Community	Community involvement and associated time	Less heat stress during summer and warmer houses in winter. Mitigation against climate change.
CU 6.6.25	Development controls	Investigate changing planning regulations to allow off grid developments as well as advocating for strengthened DCP and Basix requirements (renewable energy, energy and water efficiency, transportation)	L	Council	•Council resourcing – staff allocation • Council advocacy	Increased resilience in the community in case of power outages.
CU 6.6.26	Flooding and Extreme Heat	Investigate innovative pavement and road surface technology, like porous surface, cool pavements, high reflectivity surfaces etc.	L	Council	Council resourcing – staff allocation	Less local flooding. More safety on roads. More visual amenity

Adaptation Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.6.27	Resilience	Plant more fruit/food trees	O	Community & Council	<ul style="list-style-type: none"> Community involvement and associated time Council Advocacy 	Self-sufficiency – less dependence on external food supplies
CU 6.6.28	Resilience	Consider insulation and passive cooling for essential computer systems that are dependent on cooling systems that require power	L	Community & Council	<ul style="list-style-type: none"> Community involvement and associated time Council or grant funding 	Less reliance on power to provide cooling services for IT infrastructure
CU 6.6.29	Water management	Investigate opportunities to slow down the flow of water over vegetated surfaces to maintain water flow and retention in rivers and creek	M	Community & Council	<ul style="list-style-type: none"> Community involvement and associated time Council resourcing – staff allocation 	Water availability. Reduced risk of erosion. Reduced risk of flash flooding
CU 6.6.30	Continuity of business	Ensure business continuity is well planned for. Pre-deployment of backup generators prior to extreme weather	M	Community & Council	<ul style="list-style-type: none"> Community involvement and associated time Council resourcing – staff allocation 	Continuity of business during power outages.
CU 6.6.31	Continuity of water supply	Council needs to prepare a business continuity plan for the supply of chlorine to water treatment plants. Chlorine is being transported in B doubles, which reduces road options during extreme weather	L	Council	Council resourcing – staff allocation	Ensuring continued safe water supply for the community
CU 6.6.32	Extreme Heat	Increase uptake of green roof spaces and investigate incentives for facilitation	L	Community & Council	<ul style="list-style-type: none"> Community involvement and associated time Council or grant funding 	Decrease surface temperature in urban areas. Creates cooler cities. More biodiversity in metropolitan environments
CU 6.6.33	Storm water	Install additional filters and GPT's at storm water collection to stop litter and pollutants entering waterways	L	Council	Council or grant funding	Healthier waterways. Reduced risk of flash flooding

6.7. EDUCATION ACTION PLAN

TABLE 10: ACTION PLAN – EDUCATION

Education Action Plan	Initiative	Action	Timeframe	Responsibility	Resources Required	Benefits
CU 6.7.1	Engagement	Support education programs in schools	O	Council	Council or grant funding	More knowledge in the community of how to live more sustainably. Fewer GHG emissions. Improved resilience
CU 6.7.2	Provide knowledge	Provide information on local businesses who are producing sustainable goods	M	Council	Council resourcing – staff allocation: >Education >Advice >Promotion of relevant information	More local production and consumption. Improved resilience. Fewer GHG emissions from transport
CU 6.7.3	Demonstration	Investigate the provision of sustainable living centres in major towns that provide advice, workshops and demonstration	L	Council	Council or grant funding	More knowledge in the community of how to live more sustainably. Fewer GHG emissions. Improved resilience
CU 6.7.4	Provide Knowledge	Update QPRC website to provide information on various energy and water related rebates	S	Council	Council resourcing – staff allocation: >Update website	Savings to the community. Increased uptake of energy or water related efficiencies. Fewer GHG emissions

APPENDICES

APPENDIX A: ENERGY ABATEMENT SUPPORTING INFORMATION

- Many of the actions recommended for the Queanbeyan-Palerang community are aimed at reducing GHG emissions – i.e. climate mitigation. The ‘greening of the grid’ (reduced emissions intensity of the electricity grid) will aid in this; as more renewable energy projects are built the overall carbon intensity of electricity delivered in Australia will reduce.

However, Queanbeyan-Palerang is a high growth region, and with the population of the LGA is expected to grow by more than 30% to 2036, local action to reduce GHG emissions is needed if overall emissions are to reduce. This will be largely focused on efforts to reduce energy demand, switch to renewable energy, and transition to electric, hydrogen and hybrid vehicles over time.

Projected growth is illustrated in the chart and table below, from profile.id.

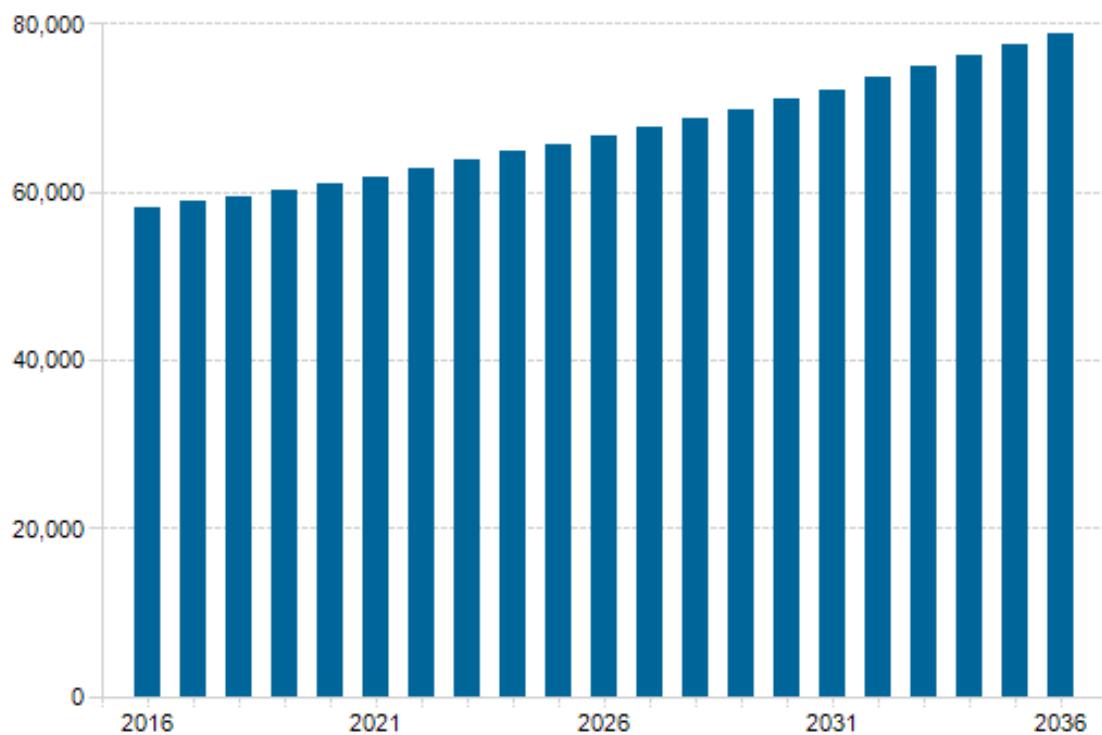


FIGURE 28: PROJECTED POPULATION INCREASE TO 2036 IN QUEANBEYAN-PALERANG³¹

TABLE 11: PROJECTED POPULATION INCREASE TO 2036 IN QUEANBEYAN-PALERANG

Summary	2016	2021	2026	2031	2036
Population	58,119	61,832	66,593	72,177	78,756
Households	22,636	24,332	26,260	28,447	30,890
Average household size	2.54	2.52	2.51	2.51	2.52
Dwellings	24,266	25,965	27,902	30,101	32,563

³¹ Population and household forecasts, 2016 to 2036, prepared by .id , the population experts, December 2017, <https://home.id.com.au>

As well as population growth forecasts, profile.id includes information about the types of dwellings in the LGA. Data for 2016 show that the majority of housing is single dwelling, with just 7.8% of dwellings being high density. Data on dwelling types is shown below.

TABLE 12: DWELLING TYPES IN QUEANBEYAN-PALERANG IN 2016³²

Dwelling type	Number	%
Separate house	17,156	71.5
Medium density	4,632	19.3
High density	1,872	7.8
Other dwelling types	325	1.3
Total Private Dwellings	23,985	100.0

Vehicle ownership in the LGA is high, and data show that there are more than 36,000 motor vehicles owned by local residents. This figure will grow as the region's population continues to increase.

TABLE 13: CAR OWNERSHIP IN QUEANBEYAN-PALERANG IN 2016³³

Number of cars	Number of dwellings	%	Number of motor vehicles
No motor vehicles	843	3.9	0
1 motor vehicle	6,332	29.4	6,332
2 motor vehicles	7,615	35.4	15,230
3 or more motor vehicles	4,796	22.3	>14,388
Not stated	1,947	9.0	Unknown
Total households	21,533	100.0	>35,950

Further contributing to energy demand and resultant GHG emissions in the region, there are nearly 4,700 registered businesses in Queanbeyan-Palerang. While many businesses (e.g. many in Construction) will be non-employing and/or not have business premises, most businesses will occupy premises in buildings within the LGA. The data below are taken from profile.id for 2018.

TABLE 14: REGISTERED BUSINESSES IN QUEANBEYAN-PALERANG IN 2018³⁴

Industry	Number	%
Construction	1,117	23.8
Agriculture, Forestry and Fishing	606	12.9
Professional, Scientific and Technical Services	510	10.9
Rental, Hiring and Real Estate Services	408	8.7
Transport, Postal and Warehousing	332	7.1
Financial and Insurance Services	262	5.6
Retail Trade	220	4.7
Manufacturing	218	4.7
Administrative and Support Services	161	3.4
Health Care and Social Assistance	151	3.2

³² Australian Bureau of Statistics, Census of Population and Housing 2011 and 2016. Compiled and presented by .id , the population experts. <http://www.id.com.au>

³³ Profile.id, ibid

³⁴ Australian Bureau of Statistics, Counts of Australian Businesses, including Entries and Exits, 2016 to 2018 Cat. No. 8165.0. <http://www.id.com.au>

Accommodation and Food Services	145	3.1
Wholesale Trade	91	1.9
Other businesses	471	10.0
Total business	4,694	100.0

GHG EMISSIONS ABATEMENT OPPORTUNITIES IN QUEANBEYAN PALERANG LGA

As outlined earlier, GHG emissions in Queanbeyan-Palerang LGA (stationary & transport energy and waste) are estimated to be 830,700 t CO₂-e in 2016/17, dominated by emissions from stationary energy (electricity and natural gas), and emissions from transport (petrol and diesel) and agriculture. Emissions from waste are smaller and are being largely addressed via Council's waste strategy.

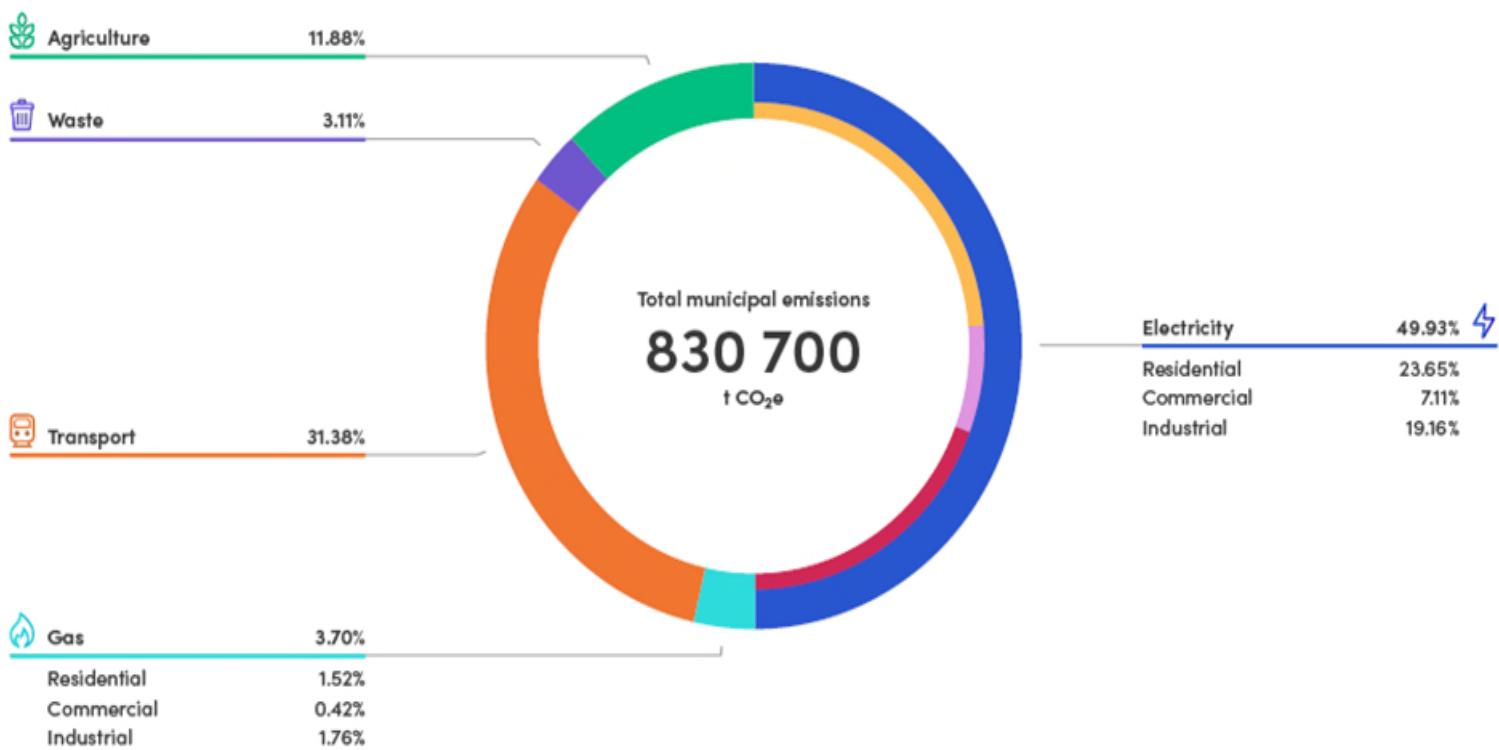


FIGURE 29: COMMUNITY CARBON FOOTPRINT- PERCENTAGE CONTRIBUTION OF EMISSION SOURCES

Based on existing and emerging technologies, there is significant potential for emissions reduction:

- Solar PV uptake is at 20.7% however the average size per residential system is just 3.7 kW, so there is considerable scope for new solar installations, and scope for existing solar PV systems to be expanded. Commercial businesses have also begun to implement solar PV (est. 10% of buildings), but there are likely to be many more opportunities for new PV. Larger solar PV systems will be able to supply energy on demand, store for later use, and power electric vehicles.
- Energy efficiency remains the cheapest form of GHG emissions abatement, and there will be ongoing opportunities across all sectors and technologies to make further gains.

- Households and businesses can choose to buy their electricity from renewable energy sources. While there is a cost premium to do this, this has been reducing as the cost of renewables has decreased.
- With almost 25,000 dwellings and over 4,000 businesses, many hot water services will be replaced/upgraded over the next ten years, with a significant opportunity to see solar PV, solar hot water and heat pumps become the predominant forms of energy supply for this service³⁵.
- Nearly 7,000 new residential dwellings are forecast to be built over the next 20 years, presenting opportunities to lock in low energy / renewable energy solutions at design and planning stages.
- Electric, hybrids and in the longer term potentially hydrogen vehicles will provide residents and businesses with opportunities to reduce costs and emissions by switching from diesel and petrol-fuelled vehicles.

Energy-related abatement opportunities for Queanbeyan-Palerang LGA can be considered across four broad categories as illustrated below.

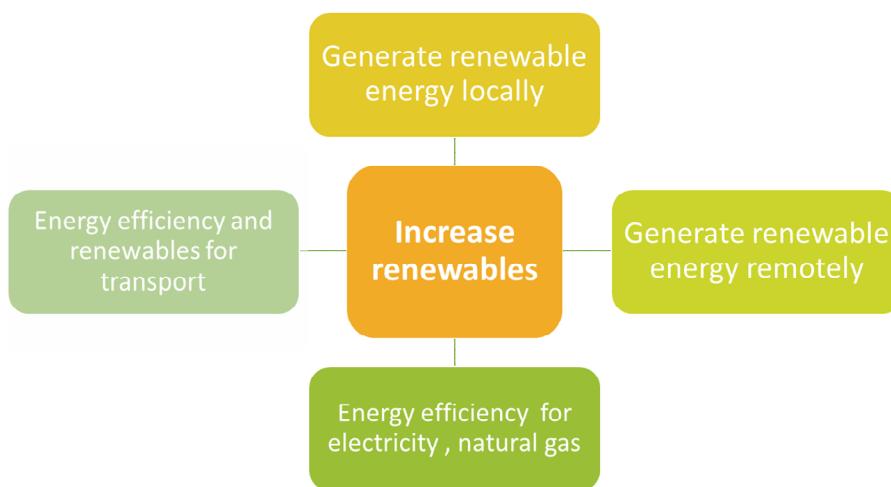


FIGURE 30: FOUR BROAD CATEGORIES OF ABATEMENT FOR QUEANBEYAN-PALERANG COMMUNITY

- **Locally generated** (within LGA) renewable energy such as solar PV and from the use of heat pumps and solar hot water.
 - Some local governments have modelled the potential for **solar PV** within their region, drawing on mapping tools such as SunSPoT³⁶ (from APVI) as well as bespoke modelling. With a strong bias towards free-standing dwellings the capacity (i.e. useable roof space) for solar PV in the area is very high. As batteries become more affordable and as electric vehicle market share grows, rooftop solar PV is likely to be a very significant opportunity for the Queanbeyan-Palerang area to reduce its emissions. Solutions to help renters and strata schemes to implement solar PV are also maturing and will enable this opportunity to be exploited in future. If for example two thirds of free-standing houses (in 2036) could implement 7 kW of solar PV each then the total

³⁵ NSW Hot Water Guide for Households and Businesses: <https://energy.nsw.gov.au/media/1476/download>

³⁶ <https://pv-map.apvi.org.au/sunspot>

potential GHG emissions abatement would be more than 160,000 t CO₂-e from over 150 MW of solar PV capacity (at today's grid carbon intensity).

- Renewable heat is available to heat water for domestic and commercial applications. Over the next say 15 years it is likely that nearly all hot water systems in the region will be replaced and that all new hot water systems can be energy efficient and low-emissions, providing an excellent opportunity to achieve GHG savings in one of the most energy-intensive appliances used in homes. This can be via:
 - Air-source heat pumps (ASHP) for water heating that use a quarter to a third of the energy of an electric-heated system and qualify for certificates under the Renewable Energy Target scheme (RET). Where used with either solar hot water or solar PV systems, close to 100% renewable energy can be achieved.
 - Solar hot water (usually with electric or gas boost) systems are also eligible to claim rebates under the RET. Savings in energy from solar hot water systems are typically in the range 50-90% depending on location and use.
 - Ground-source heat pumps (GSHP) systems are more efficient than air-source systems. However, these are not eligible under the RET, are more expensive, and tend to be more prevalent in industrial and commercial situations.

Allied to water conservation measures such as flow control for showers, the potential GHG emissions abatement for hot water heating is considerable.

- **Remotely generated** renewable energy: The scope for residents and businesses in Queanbeyan-Palerang LGA to access renewable electricity is only limited by consumption levels. Hence the raw emissions abatement potential from the purchase of renewable energy is up to the level of 2016/17 stationary GHG emissions assuming that households and businesses can also switch from gas to electricity (e.g. for hot water, heating and cooking).
- **Energy efficiency** opportunities for business and residents in the LGA (stationary energy) remains the most cost-effective way to reduce GHG emissions. Drawing on analysis by ClimateWorks Australia it is estimated that stationary energy savings potential over a 10-year period for households and businesses is around 25-30% (excluding hot water). This equates to around 160-190,000 t CO₂-e annually, based on today's grid carbon intensity.
- **Transport** energy, through the purchase of electric, hybrid and in future hydrogen vehicles: With a growing population transport fuel consumption will rise. Increased access to public transport and demand management measures may mitigate this increase, however the emissions intensity of vehicles is likely to be the main factor that could drive emissions down, with smaller and hybrid vehicles currently offering the greatest GHG emissions abatement potential. Going forward, electric and hydrogen powered vehicles may offer new opportunities for GHG emissions abatement, subject to the source of electricity used to power an EV or to manufacture hydrogen.

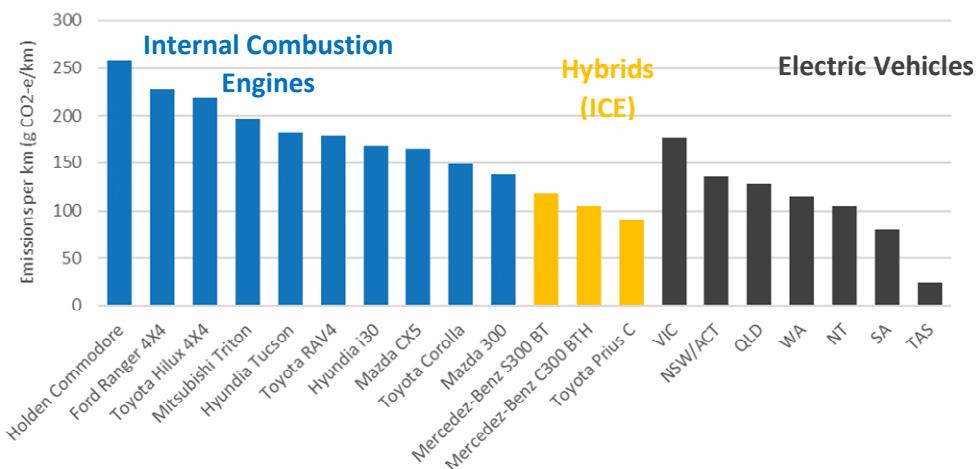


FIGURE 31: COMPARISON OF EMISSIONS PER KILOMETRE FROM MOTOR VEHICLES IN AUSTRALIA³⁷

OPPORTUNITIES TO UNLOCK THE GHG EMISSIONS ABATEMENT POTENTIAL

The community is made up of many building types and many different stakeholders. There are:

- Owners-occupiers in houses, apartments and in business,
- Owners – landlords in houses, apartments and in business, and
- Tenants in houses, apartments and in business

GHG emissions abatement solutions need to meet the needs of different stakeholders, in particular solutions are needed that overcome owner-tenant split incentives.

Opportunities that Council can implement or help to facilitate in coming years to see some of this potential realised are outlined below, including:

1. Measurement of whole-of-LGA GHG emissions
2. Increase solar PV uptake in separate houses and business
3. Increase solar PV uptake in strata
4. Battery storage
5. Water heating with renewables
6. Community energy
7. Peer-to-peer energy trading
8. Purchasing renewable energy
9. Energy efficiency
10. Review Council's Development Control Plan
11. Education and engagement initiatives to place greater emphasis on GHG emissions abatement
12. Electric vehicles

³⁷ <http://www.armhem.com.au/how-green-are-electric-vehicles/>

MEASUREMENT OF WHOLE-OF-LGA GHG EMISSIONS

Description	<p>The setting of targets for GHG emissions abatement calls for the establishment of a base against which future performance can be measured. A framework to report on all major GHG emissions sources should ideally be aligned with the GHG Protocol for Cities known as Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)³⁸.</p> <p><i>The GPC is the result of a partnership between World Resources Institute, C40 Cities Climate Leadership Group and ICLEI – Local Governments for Sustainability (ICLEI). It provides a robust framework for accounting and reporting city-wide GHG emissions. It seeks to:</i></p> <ul style="list-style-type: none"> ➤ <i>Help cities develop a comprehensive and robust GHG inventory in order to support climate action planning</i> ➤ <i>Help cities establish a base year emissions inventory, set reduction targets, and track their performance</i> ➤ <i>Ensure consistent and transparent measurement and reporting of GHG emissions between cities, following internationally recognized GHG accounting and reporting principles</i> ➤ <i>Enable city inventories to be aggregated at subnational and national levels</i> ➤ <i>Demonstrate the important role that cities play in tackling climate change, and facilitate insight through benchmarking – and aggregation – of comparable data</i> <p>Through the Compact of Mayors, hundreds of cities across the globe have committed to use the GPC to report their GHG emissions. In NSW the Department of Industry, Planning and Environment (DPIE) has provided financial support to a number of councils to help them prepare GPC-compliant LGA inventories including transport, and to date more than 50 Australian councils have adopted this reporting standard. This included Queanbeyan-Palerang LGA.</p>
Council facilitation	<p>Council can investigate methods and costs to annually or periodically update the community's emissions using a consistent GPC-aligned method, so that future emissions in the community can be tracked and reported.</p>

INCREASE SOLAR PV UPTAKE IN SEPARATE HOUSES AND BUSINESS

Description	<p>Houses & SMEs</p> <p>Residential and SME energy rates have increased significantly in recent years and rates from 25-30c/kWh are common. IPART guidance on feed-in-tariffs (FiT) was 11.9-15 c/kWh in 2017/18, but reduced for 2018/19 to 6.9-8.4 c/kWh as wholesale electricity prices dropped. The combination of high electricity prices, FiTs and falling solar panel prices means that the business case for solar PV is stronger than it has ever been.</p> <p>Medium to large Business</p> <p>Commercial premises often have good potential for solar PV because they often satisfy several 'attractiveness' criteria for solar; that is:</p> <ul style="list-style-type: none"> ➤ Large roof spaces,
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³⁸ <https://ghgprotocol.org/greenhouse-gas-protocol-accounting-reporting-standard-cities>

	<ul style="list-style-type: none"> ➤ Long-term tenure and ➤ High daytime energy consumption <p>For the Queanbeyan-Palerang LGA three areas appear to be of significant interest in terms of solar PV potential:</p> <ul style="list-style-type: none"> ➤ Queanbeyan East industrial area ➤ Queanbeyan West industrial area ➤ Queanbeyan CBD <p>In addition to these areas there are numerous schools in the Queanbeyan-Palerang LGA. Co-benefits of schools installing PV include the education benefits that can be realised when the project outcomes are used within the education program.</p>
Council facilitation	<p>There are a range of options available to Council to facilitate greater uptake of solar PV on separate houses.</p> <ul style="list-style-type: none"> ➤ Solution expos' that bring suppliers to the community, particularly solutions for renters (e.g. SunTenants model). ➤ Solar (PV / storage and hot water / heat pump) bulk buy (reduces capital cost of acquisition and uncertainty by selecting reputable suppliers and installers). ➤ Offering rebates for the installation of solar PV. ➤ Map the Queanbeyan-Palerang LGA for solar capacity. Upskill, employ or hire someone to educate the community in the use of this solar resource. ➤ Install more solar on council-owned assets and promote more (e.g. develop a calendar to promote a range of RE options over a year including PV on free-standing homes, apartments, renewable heat, etc.). ➤ Adopt ambitious renewable energy targets to lead the way. ➤ Review the range of solar PV advice on Council's website and update regularly to reflect changing trends. ➤ Run workshops / education sessions on renewable energy to meet the needs of more community stakeholders. <p>There are several ways in which Council can engage with business to promote and facilitate greater uptake of solar PV.</p> <ul style="list-style-type: none"> ➤ Engage with Essential Energy to lobby for incentives for large solar. Solar and storage can be very beneficial to network owners, enabling them to defer or avoid costly network upgrades. ➤ Engage directly with businesses that have suitable roof space. ➤ Chamber of commerce seminars and engagement. ➤ Subsidised feasibility assessments for solar PV. ➤ Engage with schools Parents and Friends / Communities (P&F / P&C) committees to educate on the benefits of solar (cost, emissions, education, etc.). ➤ Access to pre-screened suppliers and installers, for example by extending a bulk-buy offer to the business sector.

INCREASE SOLAR PV UPTAKE IN STRATA

Description	<p>27% of residential dwellings in Queanbeyan-Palerang LGA are in medium and high-rise strata developments, and this will include both owner-occupiers as well as renters.</p> <p>Strata can be well suited to solar PV. Low-rise apartment buildings often have a good roof area relative to the number of apartments and are on residential tariffs;</p>
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	<p>medium to high rise buildings tend to have 24/7 common property demand. Physically, townhouses are no different from houses.</p> <p>The uptake of solar PV in strata is very low due to the multitude of stakeholder's involved, poor understanding of the business case/options and low engagement. There are often competing priorities for capital works funds. However, pilot projects, early movers (with good advice) and emerging hardware and software solutions can unlock this potential.</p> <p>An owner's corporation may be allowed to sell electricity to its residents, or landlords to their tenants and be considered exempt sellers under AER rules. An exempt seller is different to a normal electricity or gas retailer. Exempt sellers buy the electricity and/or gas from an electricity or gas retailer and resell it to customers in a multi-dwelling building, such as an apartment building, shopping centre, and caravan park or retirement village.</p> <p>A range of solution providers are emerging, who are seeking to develop the solar PV potential in strata schemes (owners and tenants).</p>
Council facilitation	<p>Strata represents a small to mid-sized opportunity for GHG emissions abatement from renewable energy in the Queanbeyan-Palerang LGA. Some initiatives that Council can progress include:</p> <ul style="list-style-type: none"> ➤ Collate case studies of solar (and batteries) in apartments that covers both new build and retrofit scenarios and publish these on Council's website ➤ Develop a guide and/or infographic for solar on apartments, outlining the processes that may be required, possible configurations, and spelling out AER rules such as for exempt seller status, for example. At this time there are four options for how solar PV can be deployed on a strata-titled property: <ol style="list-style-type: none"> 1. Single system for common areas 2. Multiple systems, one per unit 3. Single system shared by all – embedded network 4. Single system shared by all – behind the meter technology solution ➤ Notify Council's interest to providers of strata / apartment solutions for solar and storage, and maintain connections for opportunities to explore innovative solutions in the Queanbeyan-Palerang community ➤ Strata seminars and engagement ➤ Solution expos' that bring suppliers to the community ➤ Smart Blocks supplier directory ➤ Green Strata supplier catalogue ➤ Extend any future bulk-buy to experienced suppliers to strata developments

BATTERY STORAGE

Description	<p>Battery storage improves the case for larger solar PV systems, which results in greater carbon reduction. The main targets at present are residential (stand-alone, in micro-grids and in Virtual Power Plants or VPPs), and utility-scale. There may be a role for batteries (fed from off-peak electricity, as well as solar) in resolving local network and transmission-level constraints. This could further enable renewables uptake.</p> <p>The current residential payback is around 10+ years. Some retailers offer \$0 upfront and multi-year plans for solar & storage. The principal benefit is to</p>
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	<p>increase the value of savings to the end user and allow larger PV systems to be installed. For commercial / industrial users, batteries will be able to store and use solar, help with peak demand management, and allow cost-shifting from peak to off-peak. There is a lot of potential for the future use of batteries for peer-to-peer (P2P) trading.</p> <p>A range of options are emerging for battery storage, ranging from own-use to PPA or financed offers, to control solutions that can increase the value of each unit of energy stored via interaction with the market and other users – i.e. via P2P or in a VPP.</p>
Council facilitation	<p>Council can potentially play an important role in helping to increase the uptake of battery storage technology. This can be a key factor in raising the average size of solar PV systems installed in the LGA, and therefore enabling higher GHG emissions abatement and higher levels of self-consumption of solar generation. Potential measures include:</p> <ul style="list-style-type: none"> ➤ Engage with battery suppliers, retailers, Essential Energy and integrated solutions providers to develop strategies for storage & solar that will work best in the Queanbeyan-Palerang community, and provide appropriate support to prioritised solutions, ➤ Provide online content and run workshops / education sessions in the community for residents and business on battery storage.

WATER HEATING WITH RENEWABLES

Description	<p>Water heating is a sizeable percentage of energy use and GHG emissions in residences and business. Many residential water heating systems will be more than 10 years old. Turnover of all stock typically happens over a 15-year timeframe. Solar hot water and heat pumps can save 70%+ of emissions, greater if solar PV can meet daytime heating requirements.</p> <p>Low / zero emissions hot water heating systems are commercially viable and widely available, covering:</p> <ul style="list-style-type: none"> ➤ Heat pumps ➤ Solar hot water ➤ Solar PV (e.g. diverter to hot water) ➤ (Gas heating)
Council facilitation	<p>Council can provide information via its website and can provide links to key sites and case examples. Councils can also periodically review the marketplace for existing solutions and update information for its residents and businesses accordingly.</p>

COMMUNITY ENERGY

Description	<p>Community energy projects enable communities to participate actively in the response to climate change. They are renewable energy initiatives:</p> <ul style="list-style-type: none"> ➤ instigated by the local community ➤ scaled to the community's own energy needs ➤ funded and owned by the community
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- welcomed within the community
- accountable to their host community
- built and managed to maximise local jobs.

Community energy can involve energy supply projects such as renewable energy installations and storage, and energy reduction projects such as energy efficiency and demand management. Community energy can even include community-based approaches to selling or distributing energy.

Interest in community energy is high and in nearly all cases there are more subscribers than available shares. Current trends are an increasing focus on community projects where the host site is the user to maximise the value of solar energy generated.

The benefits of community energy projects are that they demonstrate leadership, make renewable energy affordable for the host and provide a fair return on investment for community investors. They provide accessibility to renewable energy for people who cannot install solar PV. They also forge new community partnerships, provide energy education and literacy, local sustainable investment and showcase a model for further community energy projects.

The roles involved with setting up and running a renewable energy project are:

- Host
- Owner
- Developer, financier
- Operator
- Retailer, network operator
- Energy buyer

Anyone in the community can participate through:

- volunteer or pro-bono provision of labour and services;
- investment;
- purchase of resultant products and services.

Community energy projects can usually be structured as a PPA or a community loan. With a PPA, renewable energy is developed and owned by the community, the host buys the energy (example: Repower Shoalhaven). With a loan, funds are raised from investors and lent to the host who builds and operates renewable energy projects. The host repays the loan (example: Lismore City Council, Farming the Sun).

There is a significant body of information and 'how to' available through the [National Community Energy Strategy](#), which was developed by the [Coalition for Community Energy](#) (C4CE). It is a collaboration of The Institute for Sustainable Futures (ISF), Starfish Initiatives, Community Power Agency, Embark, Alternative Technology Association (ATA), Total Environment Centre, and E2Q. The Community Energy Strategy received input from numerous clean energy groups, like the Moreland Energy Foundation, Repower Shoalhaven, Clearsky Community Solar, New England Wind and Hepburn Wind.

ARENA has also sponsored a [Community Renewable Energy Financing Toolkit](#), which was developed by Frontier Impact Group.

Council facilitation

Council can provide information via its website on community energy and can provide links to key sites and case examples.

<p>Council could consider being a host for a community energy project.</p> <p>Council could facilitate presentations by community energy organisations who wish to explore opportunities in the LGA, or to have them present to groups in the community who wish to explore new opportunities themselves.</p> <p>For projects that do commence and find suitable hosts and business models, Council support can be used to:</p>	<ul style="list-style-type: none"> ▶ Provide pro-bono expertise – financial modelling, community engagement, government grant application process etc.; ▶ Provide credit backing or directly provide loan; ▶ WCC's investment horizon and return expectations may provide a better fit than commercial operators; ▶ Provide board expertise, particularly financial
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PEER-TO-PEER ENERGY TRADING

Description	<p>"Peer-to-peer" energy trading promises to enable direct trading of energy from one party (e.g. household) to another, thereby cutting out the "middleman" and allowing transparent dealings between peers.</p> <p>The regulatory environment does not yet allow for peer-to-peer trading, but a number of trials using "blockchain technology" are currently being conducted. These include those by Power Ledger in Perth and Auckland; Transactive Grid in New York; Grid Singularity in Austria and AGL in Melbourne and Adelaide.</p> <p>Ideally, P2P trading allows users to control the source and the destination of their power and allows them to set their own terms, especially the price. P2P trading allows producers of renewable energy to be treated the same as a power station, even if they only have a small solar PV system.</p>
Council facilitation	<ul style="list-style-type: none"> ▶ Targeted communications to recognised industry leaders in Clean Energy ▶ Provide online resources to include emerging opportunities in P2P ▶ Education / workshop delivery on emerging RE sourcing opportunities ▶ Engage with P2P equipment and project developers: - facilitate Queanbeyan-Palerang LGA businesses or residents as trial participants ▶ Investigate the feasibility of these opportunities for Council

PURCHASING RENEWABLE ENERGY

Description	<p>There are multiple ways that renewables can be purchased, most obvious examples are GreenPower® and renewable energy buyers groups. However, large corporations can also buy LGCs in the spot market, or enter into a Power Purchase Agreement with a renewable energy developer.</p> <p>There is also an option to purchase GHG neutral electricity. This is achieved by the electricity retailer purchasing Australian and overseas carbon offsets (not necessarily based on renewable energy) to make the electricity supply carbon neutral. This option is currently only available from a few retailers.</p>
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	<p>Purchasing groups are still a new idea. Establishing a corporate PPA is complex, time-consuming and contains approaches and risks not previously considered by most participants. These take time and resources to resolve.</p> <p>Theoretically, all of Queanbeyan-Palerang's energy demand can be met by purchasing renewable energy. This could include existing electricity demand, growth through fuel switching from gas to electricity, and future fuel switching for passenger vehicles to EVs.</p>
Council facilitation	<ul style="list-style-type: none"> ▶ Provide online advice on renewable energy purchasing ▶ Engage with GreenPower® to get them to present – e.g. a new Guide for business was developed including PPA options which could be promoted to business. The NSW DPIE also developed a new hot water guide, so both guides could be presented to the Queanbeyan-Palerang community to promote both renewable electricity via GreenPower® and renewable heat.

ENERGY EFFICIENCY

Description	<p>Energy efficiency remains the cheapest form of GHG emissions abatement for many householders and business.</p> <p>Residential</p> <ul style="list-style-type: none"> ▶ Energy efficient lighting solutions ▶ Heat pumps for air conditioning ▶ Solar hot water, heat pumps, solar PV for heating water ▶ Energy efficient appliances and equipment ▶ Energy Saver program by NSW Government for residential <p>Businesses</p> <ul style="list-style-type: none"> ▶ Energy efficient lighting solutions ▶ Energy efficient HVAC solutions ▶ Building Management Systems ▶ Energy efficient appliances and equipment ▶ Energy Saver program by NSW Government for business
Council facilitation	<p>Council can help increase the uptake through the following measures:</p> <ul style="list-style-type: none"> ▶ Information and awareness programs ▶ Education and training for tradespeople ▶ Bulk procurement programs ▶ Incentives to replace existing lighting and appliances (e.g. link to the Energy Saver program) ▶ Engage with and/or develop a local business program to work with businesses to increase their energy efficiencies ▶ Educate Queanbeyan-Palerang businesses on changes to Section J of the Building code that will require new buildings and refurbishments to achieve significantly higher levels of energy efficiency

REVIEW COUNCIL'S DEVELOPMENT CONTROL PLAN

Description	<p>There has been rapid evolution in a range of technologies in recent years, including:</p> <ul style="list-style-type: none"> ○ Solar/renewable technologies ○ Battery storage ○ Buildings exceeding 4.5-Star NABERS ○ Efficiency of heat pumps/reverse cycle air conditioning and appliances <p>Changes to the BCA will set more stringent targets for energy efficient buildings, including consideration of renewable energy.</p>
Council facilitation	<p>Council could review and update DCP and related documents to include guidance or recommendations regarding:</p> <ul style="list-style-type: none"> ○ GHG positive precincts ○ Higher targets for NABERS & Green Star and encouragement to go beyond BASIX requirements ○ Review detailed energy efficiency requirements and update to reflect current status and technologies ○ Strengthen requirements on renewable energy – i.e. show why renewable heat for space or water heating, or solar PV should NOT be implemented <ul style="list-style-type: none"> ▪ For example: Require all Development Applications to include assessment of options for rooftop PV including <ul style="list-style-type: none"> • Technical assessment of opportunity • Financial assessment of opportunity • Proposed installation or justification for exclusion ○ Recognise emergence of battery storage ○ Include EV provisions <p>Council planning could encourage low- and zero GHG built environments, embedding passive solar design into all new and re-developments, preserving solar access and minimising barriers to low-impact forms of renewable energy (such as PV) in the urban environment.</p> <p>In addition Council can review its Development Application (DA) processes as these relate to solar installations, to help ensure good communication and information flows between Council and proponents</p>

EDUCATION AND ENGAGEMENT INITIATIVES TO PLACE GREATER EMPHASIS ON GHG ABATEMENT

Council facilitation	<p>Business</p> <ul style="list-style-type: none"> ➤ Increase the number of business events delivered that focus on existing and emerging GHG emissions abatement topics ➤ Review resources available to business and potential to be updated to reflect current and future trends, e.g. <ul style="list-style-type: none"> ○ Energy Saver program ○ Revised Building Code ○ Solar potential of Queanbeyan-Palerang LGA ○ Solar in commercial strata and solar for business tenants ○ Virtual Power Plants & microgrids ○ New Greenpower guide for business ○ Power purchase agreements, buying RE, joining an RE buyers group <p>Residential</p> <ul style="list-style-type: none"> ➤ Increase the number of community events delivered that focus on existing and emerging GHG emissions abatement topics ➤ Review resources available to community and potential to be updated to reflect current and future trends, e.g. <ul style="list-style-type: none"> ○ Energy Saver program ○ Virtual Power Plants & microgrids ○ Solar potential of Queanbeyan-Palerang LGA ○ Solar in residential strata and solar for residential tenants ○ New hot water guide for households and business ○ Buying GreenPower® or switching to renewable energy supplier
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ELECTRIC VEHICLES

Description	<p>There are relatively few electric vehicles in use at this time, with just 0.3% of vehicle sales in Australia in 2018 being electric. However trends in sales of EVs are increasing, more states including NSW are seeing rollouts of rapid DC charge networks, and cities and towns are seeing increasing EV infrastructure rolled out that will support charging on-street, in shopping centres, in carparks, as well as in homes and businesses.</p> <p>A rapid-charge unit in Braidwood forms part of a network of around 40 DC charge stations being rolled out by NRMA in NSW for example.</p> <p>The ACT Government has committed to transition all of its passenger fleet to EV within the next few years, and many ACT government employees will reside in the Queanbeyan-Palerang area.</p> <p>As such there is a case for Council to assess and implement measures that will facilitate this transition and provide fuel supply security to drivers of EVs in and through the LGA.</p>
Council facilitation	<p>Council can potentially:</p> <ul style="list-style-type: none"> ➤ Implement a local network of suitable charging infrastructure (e.g. roadside, Council carparks, at Council facilities) to support EV charging.

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- Engage with the ACT to understand their plans and work cooperatively to develop and implement measures to support the rollout of EVs in the region.
 - Lead by example and source EVs in Council's fleet.
 - Link with electric vehicle providers (passenger vehicles, commercial vans and trucks, chargers, integrators, etc.) to provide education and information that will assist the community to take informed decisions when purchasing vehicles.
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APPENDIX B: PUBLIC EXHIBITION SUGGESTED CHANGES AND KEY COMMENTS

TABLE 15: SUGGESTED CHANGES OR KEY COMMENTS FROM PUBLIC EXHIBITION

Key feedback suggestions and comments	Number of times suggested
Energy/Renewables	
Microgrids/or other community renewable energy projects and storage - need more support and direction from council, including funding. This may include regulatory and commercial support	7
Source all electricity from renewable sources, including PPA's	3
More energy efficiency/ renewable energy actions within the Community plan	2
Incorporate stand-alone solar powered street lights into lighting assets	1
Install associated onsite PV, batteries and control systems at electric vehicle charging stations	1
Carbon Storage & Sinks	
Explore further actions within the plans with regards to carbon sequestration and sinks	11
Further education for farmers or those living on rural block about carbon sequestration and its advantages	5
General Climate Change Education & Access to Information	
Greater accessibility and publicizing of information on current rebates for example solar and water tanks	3
Facilitate community based learning	2
Positive workshops on local action	2
Transition training for residents and staff	1
Lack of education initiatives	1
Adaptation	
Evacuation plans and information for communities with regards to extreme weather events. Including information on dealing with air and water contamination, mental health + fuel shortages	8
Key feedback suggestions and comments	Number of times suggested

Community preparedness for future extreme weather events- more information, education and transparency on dealing with and planning for extreme weather events. This could involve hosting climate change workshops and providing more information on Councils website	5
Lack of adaptation actions for Council operations	3
Telecommunication plan for extreme weather events	1
Disaster recovery actions	1
Solar passive houses and dark coloured roofs	1
Urban Environment	
Establish an urban tree canopy target and plant more trees in urban settings to mitigate the effects of heat islands in a warming world	6
Greater emphasis on urban farming and community gardens - including climate ready and drought tolerant gardens and urban farms	2
Urban tree register and inventory	1
Sustainably managed gardens and verges	1
More actions associated with urban heat islands	1
Deciduous trees in all urban settings	1
Planning	
Strengthen DCP requirements on renewable energy, energy efficiency and water conservation.	6
Identify and implement policy levers that Council has to improve housing subdivision design, building design, and the energy performance of buildings.	2
All riparian areas should remain as E4	1
Update policies and planning instruments to reflect a commitment to support community attainment of a target	1
Lobby to improve BASIX	1
Natural Environment	
Study landscape patterns to reduce the occurrence and effects of bushfires and drought. This could include cultural burning (engaging with traditional custodians) and other mitigation practices	4
Key feedback suggestions and comments	Number of times suggested
Subsidize or give away plants for new and existing residents	2

	Number of times suggested
Most of the natural environment actions within the Community Plan belong in the Council Operations Plan	1
Include scope for a biodiversity strategy	1
Increase uptake of biodiversity stewardship sites (funding mechanism for the Climate Change Action Plan)	1
QPRC tree planting strategy	1
Conserve pre-existing formal wildlife corridors as well	1
Roadside native vegetation, which constitutes linear corridors through our region, needs maintenance in the form of preventing invasive plants establishment	1
Council needs a specific environmental action plan	1
Council run nursery in oaks estate	1
Provide information to land owners about less flammable vegetation that can be planted	1
Information on replanting after fires	1
Programs of tree planting and the nurturing of animals of all persuasions should be encouraged	1
Infrastructure and Transport	
Accelerate actions within the Integrated Transport Strategy for example light rail, better bus services (especially Braidwood)	8
Facilitate active transport options- walking and cycling (comment: still a huge issue within Queanbeyan)	7
Reduce the use of impervious pavements and increase the use of permeable surfaces with high reflectivity	3
Anaerobic process for STP not aerobic- more sustainable. Or should be powered by onsite renewables	2
Significantly and rapidly increase electric vehicles or no emissions vehicles (especially hydrogen given our proximity to ACT refuelling stations) within Councils fleet	2
Shuttle service for staff between offices	1
Provide more shade sails for extreme heat days	1
Key feedback suggestions and comments	
Concrete bridges (replace wooden bridges)	1
Install community electric vehicle charging stations ASAP	1
Significantly and rapidly increase electric vehicles or no emissions vehicles (especially hydrogen given our proximity to ACT refuelling stations) within Councils fleet	2

Community regional carpooling system	1
Working from home- community smart hub to reduce car usage	1
Include biodiversity and water sensitive urban design in Councils Sustainable Building Design Policy	1
Waste	
The plan should include a greater emphasis on waste including composting and worm farming	4
Facilitate reuse and repurposing centres throughout the entire LGA not just Queanbeyan	3
Incorporate elements of a circular economy	2
More assurance about recycling efforts	1
Encourage composting toilets	1
Significantly reduce or ban single use plastics within Council and the community	1
Methane capture from old landfill sites	1
Community Capacity	
Community Action Plan seems to highlight that Council staff are doing everything- there needs to be more community based actions	8
Utilise community expertise within both Action Plans	5
Build climate change capacity within the community with regards to mitigation and adaptation	3
Funding/Economics	
Full or more rebate opportunities from Council	6
Support or fund 'climate' or 'sustainable' local community groups -this could be as little as providing rooms for meetings	6
Strategy does not consider the future costs of not acting on controlling climate change	3
Clearer communication on how the plan will be resourced	2
Key feedback suggestions and comments	Number of times suggested
Don't use financial savings as a guide to decide which action to prioritise or take action on	2
More funding for managing and protecting natural areas especially endangered communities	1
No capital costs in the Community Action Plan	1
Reporting	
Please include annual reporting of emissions/actions undertaken as a set action	6

Targets and Emissions Monitoring	Number of times suggested
Increase emission reduction target to 90%-100% by 2030 for Council Operations	20
Incorporate community emission reduction targets	10
Consider a carbon budget including a step by step approach (mid-term review 2025)	4
45% emission reduction target by 2030	1
Greater context around targets and greening of the grid, what does this mean?	1
Information on how QPRC targets link with state and commonwealth targets	1
Better and more comprehensive community based emission monitoring	1
Indirect emission generation through the engagement of contractors on Council's behalf. Examples might include road sealing, civil development works (e.g. The Poplars), cleaning, etc. Is it possible to estimate these figures and incorporate this data, plus associated actions, into the draft Plan?	1
Collaboration	
Collaborate more effectively with ACT and other Council's	5
Engage with pre-existing sustainability, Landcare and climate change groups on a regular bases	4
Review work already underway or completed and adapt to the local area	1
Youth engagement needs to be addressed within the Action Plan	2
Become a member of Sustainable Australia Fund	1
Water Security and Conservation	
More actions to address water supply and conservation issues in Braidwood and Bungendore	9
Key feedback suggestions and comments	Number of times suggested
More residential water saving and security actions e.g. water harvesting, tanks	4
Investigate opportunities for increasing the use of recycled water for grading roads	2
Water management- slowing down the speed of water and removing excess nutrients (swales) and rainwater gardens.	1
Structural	
Two strategies condensed into one	2
Many items in the Community Climate Change Action Plan belong in the Council Operations Action Plan	1
Too much background information	1

Abbreviation list	1
New chapter discussing likely and current impacts of climate change	1
New chapter discussing adaptation measures that are already being implemented	1
Shorten time frames within the both Action Plans	1
More input into the Performance Matrix	1
NSW Government- An expansion of Chapter 4 in the Community Climate Change Action Plan and creation of a new Chapter in the Council Operations Climate Change Action Plan detailing likely and current impacts of climate change on both the community and council operations	1
General	
There is no prioritisation of actions	6
Join Cities Power Partnership	5
Declare a climate emergency	5
Council should be a role model and leader	5
More background information on the previous QCC Action Plan	4
Remove text '1.3-1.4 % of global greenhouse gas emissions or roughly 538.9 Mt CO2-e annually as of March 2019'	3
Visual images of the area/landscapes and of climate change impacts	3
Greenhouse gas graphs and other important graphics (e.g. air temperature increases)	2
Key feedback suggestions and comments	Number of times suggested
Implementation Plan - Or information on implementation	2
Community Action Plan seems to ignore opportunities in rural areas- more information is needed for these communities	2
The Plan needs to support renters and those on low incomes	2
Don't call electric vehicles zero emission vehicles	1
Support small community based communication networks	1
The strategies do not discuss the growing cost of extracting ever scarce non-renewables, via mining and drilling	1
De-development; activities which decrease carbon emissions	1
Support regenerative farming - great examples in LGA	1

Include mental health support	1
Food security issues/ plant fruit and nut trees	1
More emphasis on just global warming	1
Specific reference be made in the Action Plan to supporting business continuity specifically in the rural and rural-residential parts of the LGA	1
Hard to follow and make sense of what moderate versus ambitious action is	1
Needs to state it is developed by Council, community and 100% renewables	1
Explain how the Council will facilitate actions in the plans	1
Include scope for emission scenarios	1

