

The Riverina Eastern Regional
Organisation of Councils (REROC)

Regional Energy Efficiency and Net Zero Plan

2024-2028

REROC

RIVERINA EASTERN REGIONAL
ORGANISATION OF COUNCILS



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Regional Energy Efficiency and Net Zero Plan

Published 2024

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Availability



The Regional Energy Efficiency and Net Zero Plan is available on the REROC website
www.reroc.com.au

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Contents

Acknowledgement of Country	1
Executive Summary	2
Introduction	4
Background	7
About the Region: Overview	8
Vision, Mission and Strategic Themes	9
Theme 1: Drive uptake of energy efficiency and emissions reduction technologies and initiatives	12
Theme 2: Raise awareness and understanding of energy efficiency and net zero emissions	16
Theme 3: Advocacy and Collaboration	19
Theme 4: Monitoring and Evaluation	20
Appendix - REROC Council Profiles	21
Glossary of Terms	42



*Marrar Canola Fields, Marrar NSW 2652 -
Photo courtesy of Thomas Parker*

Acknowledgement of Country

The Riverina Eastern Regional Organisation of Councils acknowledges the Wiradjuri Aboriginal Nation as the traditional custodians of the land, seas, skies and waterways on which we reside, work, travel and meet.

We recognise and acknowledge the connection Wiradjuri people have to their land, their waters and surrounding communities and their history on the lands.

Executive Summary

The Riverina Eastern Regional Organisation of Councils (REROC) is a voluntary association of seven local government bodies and one Water County Council located in the eastern Riverina region of NSW. Originally formed in 1994 the aim of the organisation is to assist councils to operate more efficiently and effectively through working together to achieve economies of scale and scope and to provide members with a single representative voice.

REROC began working on energy efficiency initiatives with the NSW Sustainable Energy Development Authority (SEDA) and Member Councils in 2000. In 1998 REROC put out its first aggregated retail energy procurement, saving Councils over \$1 million a year. Since then REROC has held the Energy and Innovation Conference several times and played a lead role in the Southern Lights project, which led to the upgrading of over 75,000 street lights to LED (with improved lighting quality) across 41 Local Government Areas, stretching from Bega to Broken Hill. REROC worked closely with NSW Sustainable Councils (Department of Climate Change, Energy, the Environment and Water), to develop Energy Saving Action Plans for each of the Member Councils in 2020-2021. In 2023 Sustainable Councils funded a Regional Energy and Net Zero Project Officer position at REROC, and at Joint Organisations in eight other rural and regional areas, through the Joint Organisation Net Zero Acceleration (JONZA) program.

The NSW Government's Net Zero Plan and emission reduction targets

have established the State's commitments in moving to net zero. The NSW Net Zero Plan clarifies the opportunities that the emission reduction transition provides for job creation, costs-savings for households and businesses, and the promotion of investment and the economy.

The REROC Regional Energy Efficiency and Net Zero Plan was developed in consultation with Member Councils and with NSW Sustainable Councils. The plan draws from the Energy Savings Action Plans of each of the REROC Member Councils & sets out Themes, Objectives and Actions to position Member Councils to make the most of energy efficiency, cost savings and emission reductions in this dynamic environment. This Plan outlines REROC's goals, actions & intentions in relation to implementing energy efficiency and Net Zero initiatives over the next 5 years. The Plan reflects the goals contained in the State Net Zero Plan.



Vision

A resilient, sustainable and low emissions region with low cost and efficient energy use.



Mission

Create energy efficient and low emissions communities through collaborating with Federal, State and local governments, businesses and residents.



Theme 1: Drive uptake of energy efficiency and emissions reduction technologies and initiatives



Theme 2: Raise awareness and understanding of energy efficiency and net zero emissions

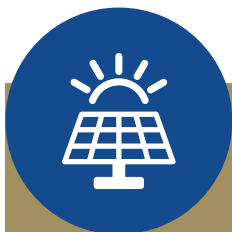


Theme 3: Advocacy and collaboration



Theme 4: Monitoring and evaluation

REROC's Strategic Objectives for each Theme are as follows:



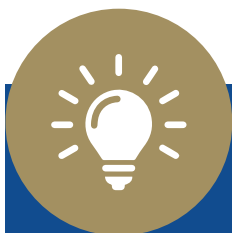
Theme 1: Drive uptake of energy efficiency and emissions reduction technologies and initiatives

1. Facilitate energy management in councils to drive efficiency and reduce emissions.
2. Invest in sustainable electricity and energy efficiency initiatives and technologies.
3. Implement transport solutions that increase efficiency and decrease emissions.
4. Explore and implement opportunities to optimise council lands to reduce emissions.
5. Manage waste and resource recovery to capture energy efficiencies and reduce emissions.



Theme 3: Advocacy and collaboration

1. Advocate for policy and finance products that reflect the circumstances of regional and rural councils and communities.
2. Build and maintain relationships with State and Federal politicians and agencies to further the implementation of the Regional Plan.
3. Develop relationships that foster collaboration and share learnings between regional organisations of councils and other key stakeholders.



Theme 2: Raise awareness and understanding of energy efficiency and net zero emissions

1. Deliver education and professional development programs for councils to build knowledge and skills on energy efficiency and emissions reduction.
2. Design and implement community education programs that build awareness of actions that can be taken to increase energy efficiency and reduce emissions.



Theme 4: Monitoring and evaluation

1. Measure energy savings and emissions reductions to demonstrate the value of investing in technologies and initiatives.

Introduction

Changing Government targets and legislation, developing technology options, evolving regulatory and market conditions come together to create a very dynamic environment within which this Plan is created. Change in one leads to further change from another. Within this, opportunities present themselves for councils and their communities to reduce emissions in ways that increase efficiencies and reduce costs.

Rapid Developments in Energy & Emissions Policy & Regulation

Both State and Federal Governments have increased their focus on emission targets and the decarbonisation transition of energy and other sectors. The NSW Government recently legislated targets for emission reductions of 50% by 2030 and 70% by 2035 (relative to 2005 levels) and net zero emissions by 2050. The *NSW Net Zero Plan Stage 1: 2020–2030* highlights the increased jobs and economic growth associated with the decarbonisation pathway.

The Federal Government has recently announced it will underwrite 32 gigawatts of renewable electricity, equivalent to around half the current National Electricity Market capacity, to be added to the grid by 2030. This will consist of 9GW of batteries and other storage and 23GW of variable renewable generation. This is to achieve the Federal Government targets of net zero by 2050, 82% renewables in the National Energy Market (NEM) by 2030, and a 43% reduction in national emissions by 2030 relative to 2005 levels. In addition, the Federal Government recently announced a \$15 billion National Reconstruction Fund, which includes a key priority of investment in renewables and low emission technologies.

These Government targets, laws and funding programs have a bearing on Member Councils in a number of ways. For example, significant funding and attention is being directed at mid and small scale electricity generation, usage and storage. A \$200 million program for mid-scale (“community”) batteries, which are of a suitable size for council facilities, is being run by the Australian Renewable Energy Agency (ARENA). A \$100 million Federal Community Energy Upgrade Fund, directed at councils, will have funding rounds in 2024 and 2025.

There are other signs of focus and possible funding at the council, business and household scale resulting from National and State commitments. For example, at the November meeting of the Energy and Climate Change

Ministerial Council (which includes the Energy Ministers of the States, Territories and Federal Government), there was agreement to develop a Roadmap to unlock household and community energy and reduce customer costs. Additionally, the Australian Energy Market Commission (AEMC) has recognised the importance that batteries on households and businesses (when orchestrated to respond to the needs of the grid) will play in providing energy storage needed by the grid. The AEMC states that it is seeking to provide better price signals for investment in consumer-owned batteries and other fast-response technologies. This may improve the business case for batteries on council facilities, and consequently improve the case for larger solar installations, facilitating a larger contribution to societal decarbonisation.

Other matters impacting on regulation include the major decision in 2022 to incorporate an emissions reduction objective in the National Energy Objectives. Previously there was not an environmental objective in the rules applied in regulating energy networks, markets and retailers.

Also, in a major change to ASIC company reporting, climate change reporting is mandated for the largest companies starting in 2024 with other ASIC Regulated businesses groups on-boarding by 27-28. The required disclosures



Hume Highway Holbrook Bypass, Holbrook NSW 2644

are expected to include emissions not only from the company's operations but also from its supply chain, as well as transition plans and how the company is tracking in relation to those plans. Since the largest companies will be required to report on the emissions generated by their supply chains, smaller companies and even councils will be caught-up in the new regime by virtue of having to provide supply chain information to the larger companies they either work for or purchase from.

The Australian Energy Regulator (AER) is permitting distribution network providers to develop network tariffs for solar homes and businesses, that charge for solar exports during the middle of the day, when there is often a glut of solar supply, and reward exports in the evening peak. Once again, this has a bearing on the business case for many initiatives on council facilities (and improves the case for battery storage).

Development of Low-Emission Technologies

The decarbonisation transition of the energy sector is being driven not just by emission reduction ambitions but also by the lower costs of low emission technology options. Rapid declines in the cost of low emission technologies have contributed to a correspondingly rapid increase in the deployment of those technologies.

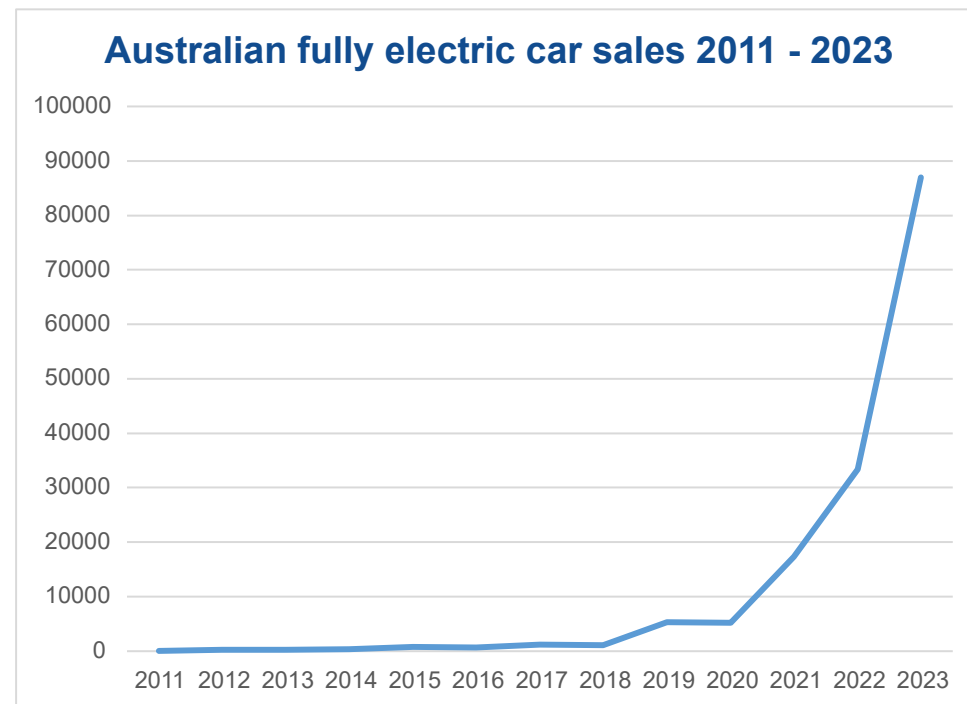


Photo courtesy of Lightbox Imageworks

The reports of the Clean Energy Council show, for example, that total cumulative installed capacity of **large-scale solar systems** in Australia increased from 10 megawatts (MW) in 2012, to 6487MW in 2022, **an increase of nearly 650 times**.

Solar generation (primarily from small rooftop solar) made up 14.7% of total electricity generation in Australian in 2022. Yet, it is common for solar generation to make up more than 50% of generation on the national grid for a few hours in the middle of the day.

Technology changes are also rapidly affecting transport. **In 2023, more new fully electric vehicles were sold in Australia than in the previous 12 years.** The NSW Government has an ambition of 50% of new car sales being EV by 2030. The Federal Government is supporting the increased uptake of EVs for fleet vehicles, for example by exempting them from Fringe Benefits Tax (if under a threshold price) and raising the threshold at which the Luxury Car Tax applies.



Forward planning for the transition of transport fleets, where suitable vehicles and prices are available, has become an increasing focus for councils. This is particularly so since, with the success in reducing council grid electricity use, emissions from petrol and diesel use have become a larger percentage of emissions from energy use for many councils.

Increases in solar and wind generation (or “variable renewable energy” VRE) are profoundly affecting aspects of the electricity market. The large amount of solar generation in the middle of the day, for example, means wholesale prices are going negative for increasing numbers of periods between 10am and 5pm. While wholesale electricity prices might average about \$70 per megawatt-hour (MWh) over a month in some states, the average hides the high degree of volatility in price. Prices can fluctuate from negative for many periods during the middle of the day, to \$300/MWh often in the evening, to the occasional extreme high prices like \$14,000/MWh or higher. That is, prices can fluctuate by a factor of more than 300 times.

This volatility presents opportunities. Recent Government grants have been aimed at battery storage and other ways of shifting (and balancing) load and supply. The sizable difference between low and high prices, as well as rewards for responding to the needs of the grid, can enhance the business case for batteries and other energy storage. “Small Generation Aggregators” aggregate the energy outputs of small generators to on-sell that energy into the market, sharing the income from the site with the generator. A new market participant, “wholesale demand response”, also responds to critical pricing events, by having many sites reduce load in concert.

Since EV charging could aggravate peak demand if not well timed in relation to the needs of the grid, price structures are being trialled and developed that incentivise EV charging in off peak periods. Incentives go so far in some cases as providing free energy in select periods. EVs may also come to be used to export electricity to the grid at peak times, with vehicle to grid (V2G) & bi-directional charging having already been allowed by the main electricity distributor in South Australia.

Prospering in this Dynamic Environment

This Plan positions REROC Member Councils to continue to prosper in this dynamic environment, while aligning to, and contributing to the achievement of the emission reduction targets and net zero. The Plan will inform the direction of REROC and its Member Councils’ activities with regard to the energy

projects undertaken. It focuses on four key themes, which are reflective of the themes in the NSW Net Zero Plan.

The Plan builds on the initiatives that REROC Member Councils have already taken.

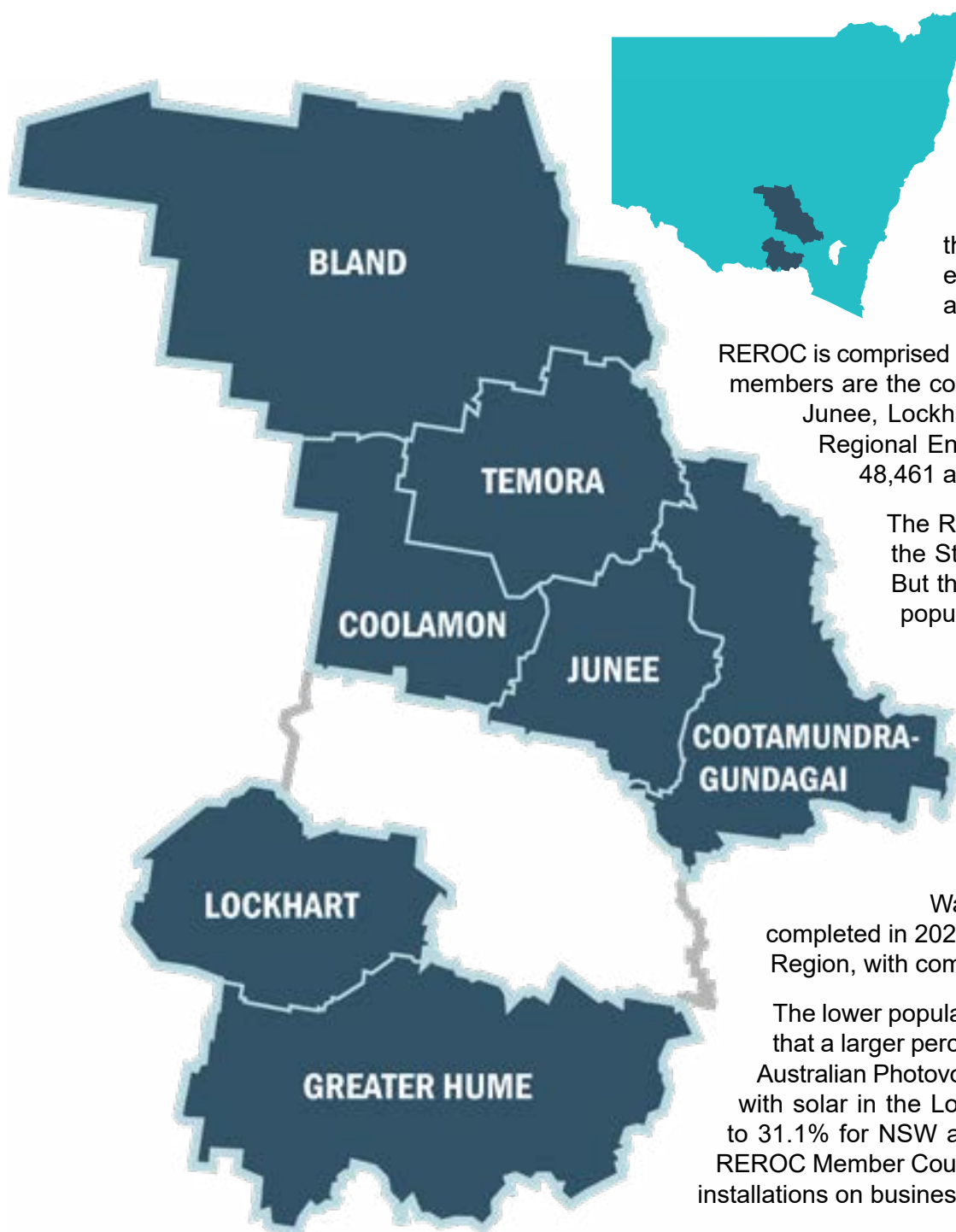
Member Councils have already deployed renewable technologies such as rooftop solar on many facilities. They have implemented energy efficient alternatives with variable speed drive pumps, upgraded street lights and lights in many buildings to LEDs and switched to other more efficient equipment. They have taken up innovative solutions like purchasing renewable generation through a consortium of councils (in a Power Purchase Agreement), leading to the provision of greener and lower cost electricity for much of their load. They have worked with their communities to reduce waste and associated emissions, for example through Food Organics Garden Organics (FOGO) schemes that separate organics from general waste.

Through these initiatives Member Councils have reduced their emissions significantly and generated savings on energy consumption.

This Plan lays out ways to move forward in the decarbonisation, cost-saving journey. It focuses not only on the deployment of proven technologies but also on piloting and learning from innovative solutions. The Plan orients Member Councils to continue learning, to keep abreast of developments and new opportunities, including new incentives.



Background



The Riverina Eastern Regional Organisation of Councils is a voluntary association of local government bodies located in the eastern Riverina region of NSW. Originally formed in 1994, the aim of the organisation is to assist councils to operate more efficiently and effectively through working together to achieve economies of scale and scope and to provide members with a single representative voice.

REROC is comprised of seven General Purpose councils and one Water County Council. Our members are the councils of: Bland, Coolamon, Cootamundra-Gundagai, Greater Hume, Junee, Lockhart and Temora as well as Goldenfields Water County Council. The Regional Energy and Net Zero Plan serves a population base of approximately 48,461 and encompasses an area just over 28,000 square kilometres.

The Region encompasses some of the smallest population communities in the State in the Coolamon, Lockhart and Junee Local Government Areas. But the area of the Region's LGAs is large relative to the populations. The population density of the Region is approximately 1/6th that of NSW as a whole. In terms of land use, agriculture dominates with 90% of the land use, primarily dryland cropping and grazing.

The open landscape means that the Region has been attractive to renewable energy generation developers, primarily for solar PV but also for the potential for wind generation in the northeast of the Region. The proximity to major new transmission lines is attractive to renewable generation developers. The Energy Connect 900km transmission interconnector from Robertstown (South Australia) to Wagga Wagga will cross through the REROC Region. It is expected to be completed in 2024. The HumeLink transmission line will also pass through the REROC Region, with completion expected in 2026.

The lower population density of the REROC Region relative to NSW as a whole means that a larger percentage of households have the opportunity to install rooftop solar. The Australian Photovoltaic Institute (APVI, June 2023) estimates the percentage of dwellings with solar in the Local Government Areas of the REROC Region as 37.7%, compared to 31.1% for NSW as a whole. APVI estimates that these solar installations are saving REROC Member Council households \$8 million per year. The annual savings from the solar installations on businesses in the Region would be additional to this.

About the Region: Overview



The **Median age for all of the LGAs** in the Region is **over 40 years** of age while the median for **NSW is 38.7 years**. This indicates the aging nature of the population. The median wage for every LGA in the Region is below the NSW median wage of \$ 58,252.

About 20% of workers in the REROC area are employed in the agriculture, forestry and fishing industry, compared to just 2% in NSW as a whole. The top four other employment industries in the REROC area are health, education, retail and construction. In the Bland LGA, mining is the second largest employment industry, with 11% of the jobs.

REROC Councils	Area (km ²)	Population	Pop. Density Person/km ²	Number of Households **	Median Age	Median Employee Income (\$**)
Bland	8558	5494	0.64	2151	43.5	\$45,534
Coolamon	2431	4465	1.84	1649	43.1	\$48,480
Cootamundra-Gundagai	3981	11404	2.86	4490	49.1	\$46,088
Greater Hume	5749	11267	1.96	3936	43.7	\$47,412
Junee	2030	6465	3.18	2103	41.4	\$51,195
Lockhart	2896	3370	1.16	1202	46.1	\$46,267
Temora	2802	5996	2.14	2393	47.5	\$44,131

* All figures based on 2022 ABS Data except **

** Number of Households as reported in the 2021 ABS Data and Median Employee Income as reported in the 2020 ABS Data

Employment



* All figures based on 2021 ABS Data

The largest occupation group in the Region is **Managers 4,323 (21%)**, the next largest occupation is **Technicians and Trades Workers 2,800 (14%)**, followed by **Professionals with 2,735 (13%)**, then **Labourers with 2,721 (13%)** and finally **Community and Personal Service Workers with 2,394 (12%)** people working in this occupation.

Vision, Mission, Guiding Principles and Strategic Themes

This REROC Regional Energy Efficiency and Net Zero Plan was developed in consultation with the REROC Energy Management Technical Group and the REROC Board. This Plan builds on the Energy Savings Action Plans completed by the REROC General Purpose Councils in 2020-2021, with funding from NSW Sustainable Councils (Office of Energy and Climate Change). This Plan also builds on related initiatives that Member Councils had already (and have since) taken. The REROC Regional Energy Efficiency and Net Zero Plan aligns to the NSW Net Zero Plan and its four priorities.

Guiding Principles

The NSW Net Zero Plan is organised into four Priorities, which are:

Priority 1: Drive uptake of proven emissions reduction technologies that grow the economy, create new jobs or reduce the cost of living

Priority 2: Empower consumers and businesses to make sustainable choices

Priority 3: Invest in the next wave of emissions reduction innovation to ensure economic prosperity from decarbonisation beyond 2030

Priority 4: Ensure the NSW Government leads by example



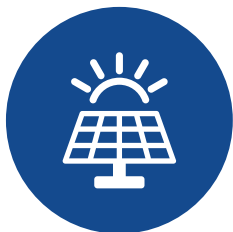
Mission

Create energy efficient and low emissions communities through collaborating with Federal, State and local governments, businesses and residents.



Vision

A resilient, sustainable and low emission region with low cost and efficient energy use.



Theme 1: Drive uptake of energy efficiency and emissions reduction technologies and initiatives.



Theme 2: Raise awareness and understanding of energy efficiency and net zero emissions.

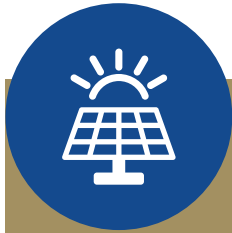


Theme 3: Advocacy and collaboration



Theme 4: Monitoring and evaluation

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Theme 1: Drive uptake of energy efficiency and emissions reduction technologies and initiatives

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Theme 2: Raise awareness and understanding of energy efficiency and net zero emissions

1. Deliver education and professional development programs for councils to build knowledge and skills on energy efficiency and emissions reduction.
2. Design and implement community education programs that build awareness of actions that can be taken to increase energy efficiency and reduce emissions.



Theme 4: Monitoring and evaluation

1. Measure energy savings and emissions reductions to demonstrate the value of investing in technologies and initiatives.



*Coolamon Station, Coolamon NSW 2701 -
Image used under license from Shuang Li/Shutterstock*



Theme 1: Drive uptake of energy efficiency and emissions reduction technologies and initiatives

Objectives:

- 1.1 Facilitate energy management in councils to drive efficiency and reduce emissions.
- 1.2 Invest in sustainable electricity and energy efficiency initiatives and technologies.
- 1.3 Implement transport solutions that increase efficiency and decrease emissions.
- 1.4 Explore and implement opportunities to optimise council lands to reduce emissions.
- 1.5 Manage waste and resource recovery to capture energy efficiencies and reduce emissions.

1.1 Facilitate energy management in councils to drive efficiency and reduce emissions

Actions:

- *Review council ESAPs to identify projects that can be implemented regionally*
- *Conduct Tariff reviews to identify where a shift in tariff would reduce energy costs.*
- *Raise the awareness of councils about Demand Response and consider opportunities for implementation*
- *Implement Smart Metering and where economical Energy Management Systems (EMS) and increase council capacity to utilise the data in decision-making*
- *Manage energy use to increase energy efficiency in public infrastructure*

The actions for this objective draw on a number of approaches to facilitate energy management. For one, REROC councils can find economies of scale in the implementation of recommendations that are common across the Member Councils' Energy Savings Action Plans. This might, for example, involve group procurement of energy efficient products (like LED lights or Variable Speed Drive pumps), contracting for detailed feasibility studies of

battery and solar installations across a set of sites, or negotiating contracts for councils to access additional payments for exporting energy at peak periods.

Conducting regular tariff reviews is valuable, because they are the catalyst for identifying opportunities for council buildings or sites to be put on a less expensive network tariff. The regularity of reviews helps keep abreast of changes to network tariffs or changes to the site's electricity usage profile.

At key times it is very valuable to the grid if electricity usage can be reduced for a while. Reducing demand in response to grid prices and signals is known as Demand Response or load flexibility. For example, when there is a tightness of electricity supply, a retailer (or Demand Response aggregator) may be willing to pay a council to delay some non-critical energy use, for example putting off pumping water for a few hours until the shortage of electricity supply eases.

Smart Metering can show changes in electricity use in different seasons and during different times of day, sometimes even to a level of 5 minute intervals. The detailed profiles of electricity use that Smart Metering provides are very important to informing decisions about many investments in energy saving upgrades, renewable generation or energy storage.

Energy Management Systems (EMSs) can coordinate and simplify the handling and presentation of the large amounts of electricity data that a

council's portfolio of sites presents. EMSs can, for example, automatically send an alert when the electricity use of a site varies unexpectedly, or when the generation of a solar installation decreases to the point that suggests there is a fault. An EMS can provide easy access to the electricity usage data for a particular site, or information about a particular aspect of a site's electricity usage. An EMS processes the detailed electricity usage data for a site and presents it in ways that allow easier and faster interpretation.

Monitoring gas and electricity usage in a building and comparing it to sector benchmarks or other council sites can help identify areas where usage is relatively high (and energy efficiency is low). There may for example be aspects of a building envelope, including lack of insulation or gaps between windows and walls, that mean that more energy is required to keep the building comfortable than is necessary. Rectifying these, like many energy efficiency upgrades, often pays for itself in a short period. Similarly, switching from gas appliances (such as hot water or space heating systems at end of life) to electric appliances can have cost and emission benefits, especially when the electrical appliance is supported by on site solar.

1.2 Invest in sustainable electricity and energy efficiency initiatives and technologies

Actions:

- *Explore and where possible pilot projects that demonstrate the feasibility of new energy technologies*
- *Use a regional Revolving Energy Fund to facilitate the development of energy efficient and low emissions projects*
- *Research income streams and develop business cases related to virtual power plants, community batteries and other technologies*
- *Explore and implement Virtual Net Metering*
- *Increase direct uptake of renewable energy within the Region*

New energy technologies that can be explored and possibly piloted include community scale batteries that can meet overnight electricity demand at a site as well as earn income through delivering electricity to the network during peaks in market demand. Other new energy technologies that REROc and the Member Councils may explore include market grade meters that allow the selling of solar generated electricity onto the electricity spot market

or inverters that communicate with AEMO (or other network operators) to control the export of electricity. In South Australia, restrictive export limits on new rooftop solar installations are relaxed for much of the time as the grid operator is given control to dynamically throttle exports via the inverter on the infrequent occasions when exports are a problem. By exploring and piloting new energy technologies such as these, Member Councils can determine the feasibility of the technology and be positioned to act on the advantages it presents.

Many low emission projects, including rooftop installations, pay for themselves in a short period and then generate strong net savings. The savings from projects with the best returns can then be re-invested into projects with longer payback periods. If the savings from low emission projects (once the capital is paid back) are re-invested for further projects, this provides an ongoing ('perpetual') fund – a "Revolving Energy Fund" – that can continue to finance projects that produce further savings and emission reductions.

The rules and roles of the electricity market are evolving in order to incentivise the balancing of variable supply and demand. Some market operators aggregate the export of electricity from battery or solar installations to supply electricity to the grid when the market most needs it. The aggregated exports are orchestrated to act like a (virtual) power plant. The payments to the site host for exports in peak periods can be much more than the usual payments for exports. This can improve the business case for larger solar installations complemented by batteries, even community scale batteries. Some Virtual Power Plant (VPP) services are provided by "Small Generation Aggregators". Researching the income streams that batteries and such aggregation services can provide is part of how REROc councils will move forward with further renewable generation and cost and emission reductions.

Many council solar installations generate more electricity than is used on site, and councils are interested in using that excess at other council managed sites. Some retailers allow an amount of electricity equivalent to that exported at one site to be used at another site at a price lower than regular retail prices. Other charges – particularly network charges for the use of the grid - must still be paid, but the first site can be paid a better price for its exports, while the second site receives cheaper power. These sorts of arrangements associated with "Virtual Net Metering" are something that REROc councils can explore and, as financially beneficial, implement. Strengthening the business case for solar PV installations in ways such as these help increase

renewable generation on council sites, or potentially at other sites in partnership with council. Such initiatives can also demonstrate leadership and spread knowledge that leads others in the Region to implement similar renewable generation initiatives that provide cost savings and emission reductions.

Again, council initiatives can provide leadership that encourages other renewable installations, particularly rooftop solar and batteries. The percentage of households with rooftop solar is already at 32-44% across the Member Councils' LGAs (according to 2023 estimates of the Australian PhotoVoltaic Institute - APVI). These residential and business solar installations would be saving households and businesses approximately \$10 million each year. This is a boost to the economies of the REROC region, especially as a sizeable percentage of the savings tends to be spent locally.

1.3 Implement transport solutions that increase efficiency and decrease emissions

Actions:

- *Develop a plan for transition to electric vehicle (EV) fleets and required infrastructure that is updated annually to reflect changes in the sector*
- *Build business case for EV fleets*
- *Use Regional Procurement to lower costs of transition to low emission fleet*
- *Explore innovative charging arrangements that facilitate the use of EVs*
- *Councils adopt policies that support transport choices that generate low emissions*
- *Address grid imbalances, lessen costs and increase EV charging capacity by using batteries and smart timing at council facilities*

There is a need for holistic planning for a transition to electric vehicle (or zero emission) fleets. Not only do suitable EVs need to be identified but the capacity of a building's electrical system

to charge multiple EVs needs to be assessed for a full fleet transition. Education of staff may also be needed. Getting started with initial steps (low hanging fruit), however, can help develop knowledge for future steps.

Business cases for different stages of the transition are needed so that the timing of the transition for different vehicles with different use cases can best realise available cost savings.

REROC strives to use regional procurement, whenever practicable, to lower costs of products or services for Member Councils. This could include aggregated purchasing of low emission vehicles and supporting infrastructure.

In circumstances where the electrical system of a building is insufficient to meet the demands of an EV fleet, innovative charging arrangements, such as a solar canopy with battery, may provide cost effective charging that bypass the limitations of the building's electrical system.

Amendments or additions to council policies can support the transition of fleets to EVs. Statements in the Community Strategic Plan or Delivery Program and Operation Plan can clarify a council's direction. Council policies that direct the assessment and selection of new vehicles can be amended so that they consider to the lifetime cost (or Total Cost of Ownership) of the vehicle. While EVs may have higher initial capital costs, their lower running and maintenance costs can mean their Total Cost of Ownership is lower than an equivalent petrol or diesel vehicle.

The electricity grid as a whole, as well as localised parts of the distribution network, can have problems with a surplus of electricity at some times and a shortage at others. Because of the relatively large draw that EVs can place on the grid, they can help balance a surplus of supply in the local or larger network. Incentives that lessen the cost of charging an EV, if the charging occurs during times of surplus of supply, are being trialled by electricity retailers and network operators. Smart chargers that can time charging in response to messaging about the needs of the grid are in early stages of use. Additionally, charging (exporting) from an EV to a building is an emerging possibility.



1.4 Explore and implement opportunities to optimise council lands to reduce emissions

Action:

- *Investigate the feasibility of using council land to generate carbon and biodiversity credits*

Councils may have an opportunity to generate tradable biodiversity credits in a (NSW) Biodiversity Stewardship Agreement, or to generate Australian Carbon Credit Units through sequestration of carbon in soil or trees. Sequestering carbon on council lands may be one way that councils can offset difficult to abate emissions (such as waste emissions, for example).

Once the long term responsibilities, costs and risks of generating carbon or biodiversity credits are weighed up against the likely benefits, some councils may have land on which they wish to pursue these opportunities.

1.5 Manage waste and resource recovery to capture energy efficiencies and reduce emissions

Actions:

- *Work with the REROC Waste Forum to explore waste to energy projects and gas capture projects*
- *Work with the REROC Waste Forum to reduce organics entering landfills*
- *Pursue energy and cost-efficient road construction through maximising onsite reuse of waste, recycling existing road materials and minimising imported materials*

For this objective, REROC's Waste Forum will work closely with the energy project to develop and implement projects.

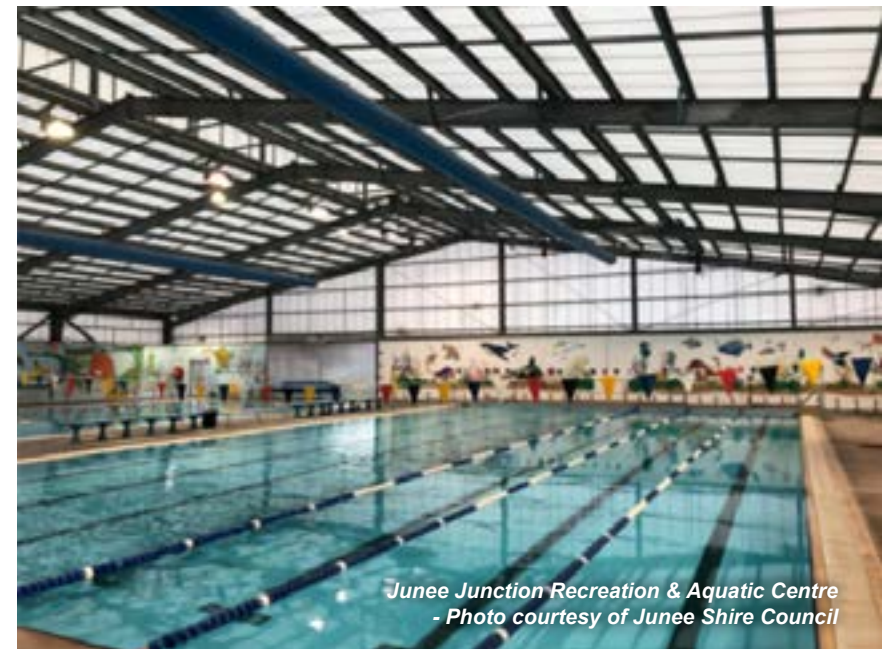
The REROC Waste Forum has been operating for over 20 years and is one of 8 Voluntary Regional Waste Groups (VRWGs) partially funded by the EPA.

The REROC Waste Forum's Waste Management and Resource Recovery Plan includes objectives to lower emissions which align with this Plan.

The Waste Forum will provide funding to investigate joint projects. The staff working in waste and energy will co-design, implement & evaluate joint projects.

The Waste Forum is already highly committed to the reduction of organics to landfill. The Forum was instrumental in introducing kerbside FOGO collections in the LGAs of four of its seven general purpose councils. In those four LGAs, the FOGO is processed locally creating a circular outcome because the composted product is used on council parks, gardens and sporting fields.

The Waste Forum runs an annual conference where topics that address reducing emissions through waste management, resource recovery and circular economy solutions are presented.



*Junee Junction Recreation & Aquatic Centre
- Photo courtesy of Junee Shire Council*



Theme 2: Raise awareness and understanding of energy efficiency and net zero emissions

Objectives

- 2.1 Deliver education and professional development programs for councils to build knowledge and skills on energy efficiency and emissions reduction.
- 2.2 Design and implement community education programs that build awareness of actions that can be taken to increase energy efficiency and reduce emissions.

2.1 Deliver education and professional development programs for councils to build knowledge and skills on energy efficiency and emissions reduction

Actions:

- *Conduct skills audit to identify knowledge gaps*
- *Deliver Energy and Innovation Conference annually*
- *Deliver training for councillors and staff*
- *Develop case studies that inform decision making*
- *Disseminate resources and information from NSW Government, LGNSW and other relevant stakeholders*
- *Implement pilots to demonstrate feasibility of promising uses of technologies*
- *Provide opportunities for members of the Energy Management Technical Group & other council staff to share their expertise and new understandings*

To ensure relevant education programs are delivered for councillors and Member Council staff, we want to identify the knowledge needed by them to make the most of the energy transition. This will be achieved through a formal skills audit as well as more informal means. Needed knowledge can be identified in interests expressed or comments in meetings or conversations, as well as from priorities identified in Energy Saving Action Plans, workshops and in Community Strategic Plans and Delivery and Operational Plans, as

well as feedback from our Energy and Innovation Conference.

Education activities need to recognise the range of roles that council staff and councillors have with energy and emission initiatives. Their roles may range from analysing potential initiatives or making decisions about whether to proceed, to planning, financing and implementing projects, evaluating results or maintaining installed equipment.

The Energy and Innovation Conference is one way that REROC raises awareness and understanding about the fast changing technologies, policies and opportunities with energy and emissions. Speakers are invited in part to address, or set the context for, directions that have been prioritised by REROC Member Councils. The Conference includes a balance of topics that range from high level policy, market, or technology development to on-the-ground practical case studies. There are talks that alert attendees to developments on the horizon, and talks that are immediately applicable. The Conference provides an opportunity for conversations between council staff, councillors, government representatives, academics, experts, community groups, and businesses to learn more about innovative best practice.

The energy transition involves quickly evolving domains. We are learning as a society within NSW and Australia but also learning from innovations around the globe. State and Federal governments are funding the development of tailored resources related to energy and emission reduction, as well as tools for analysing opportunities for different types of facilities. Different State departments, LGNSW and other organisations are hosting webinars or events that present case studies and highlight

emerging opportunities in moving towards net zero. REROC will disseminate information about such resources, tools, webinars and events.

Education or information sharing for councils will sometimes involve bringing external experts into a meeting of the REROC Board, General Managers, councillors, the Energy Management Technical Group or other staff. These external presenters could be drawn from State departments, companies presenting new energy services, or organisations providing relevant community services such as SunSPOT, Rewiring Australia, or Renew. At times, consultants will be brought in, possibly with the assistance of State government funding, to lead workshops or information sessions or to provide advice.

Information sessions may also be led by internal staff such as the REROC Regional Energy Officer or council staff about opportunities shown through pilots or research. Council staff in the REROC Energy Management Technical Group and in other roles are gaining much relevant knowledge, both from their experience and contacts and through formal education and training. We will facilitate the sharing of knowledge that is relevant to the practice of others in councils and the objectives of this Plan.

In the fast evolving space of climate policy, the energy market and developing technologies, testing applications and implementing pilots in our unique local settings can assist, support and inform decision making. This can reveal upsides and downsides and provide results that have an immediacy and credibility for Member Councils. REROC can use pilots and the testing of technologies to develop case studies that distill learning and can inform local decisions.

2.2 Design and implement community education programs that build awareness of actions that can be taken to increase energy efficiency and reduce emissions

Actions:

- *Deliver community education programs – e.g. Sunspot, Energy Savings Kit, Government initiatives, etc.*
- *Deliver Business education programs – Government programs directed at business*
- *Deliver Energy and Innovation Conference annually*

- *Develop case studies that inform decisions making*

REROC Members are already demonstrating leadership and modelling action for their communities through initiatives in energy efficiency and renewable energy, shifts to low emission vehicles and the management of greenhouse emissions from waste. In addition, councils are supporting community-led initiatives in the same areas. The energy efficiency and solar PV initiatives, and the receptivity to innovation, demonstrated so successfully by councils to lower costs and emissions can demonstrate what residents and businesses can do better to control their own energy costs and environmental impact.

The actions of this objective extend that modelling and guidance for the community by raising awareness about initiatives available to community members and businesses. For example, the free SunSPOT online tool (funded by the NSW government) allows community members and businesses to learn about the prices and savings for different options for solar and battery installations on their own home or business rooftop. SunSPOT provides an objective check on the offers that commercial operators may propose. As trusted voices, councils can inform and promote government initiatives, or credible science-based programs (such as the electrification program of Rewiring Australia), that are of benefit to businesses or residents.

From choosing more efficient equipment in the home or business, to having solar installed on the roof, to changing to an electric vehicle, low emission options can be money savers. Energy efficient designs and choices can help ease cost pressures for residents and businesses, and make them more resilient.

The REROC Energy and Innovation Conference is another way for residents and businesses to learn about emerging technologies and approaches that reduce costs and contribute to our progress towards net zero.

As part of this objective, case studies would again be used to distill and share knowledge gained from activities initiated in communities.



REROC's Energy and Innovation Conference 2022 - Photo courtesy of Jack of Hearts Photography



Theme 3: Advocacy and Collaboration

Objectives:

- 3.1 Advocate for policy and finance products that reflect the circumstances of regional and rural councils and communities.
- 3.2 Build and maintain relationships with State and Federal politicians and agencies to further the implementation of the Regional Plan.
- 3.3 Develop relationships that foster collaboration and share learnings between regional organisations of councils and other key stakeholders.

3.1 Advocate for policy and finance products that reflect the circumstances of regional and rural councils and communities

Actions:

- *Respond to proposals that will impact on energy efficiency and zero emissions in the Region*
- *Engage with statutory, business and community bodies to inform the development of policies and projects*
- *Develop case studies that inform decision making*

3.2 Build and maintain relationships with State and Federal politicians and agencies to further the implementation of the Regional Plan

Actions:

- *Align our Regional planning to State and Federal Net Zero plans and targets*
- *Inform politicians and agencies on the rationale and progress of this Plan and the projects that are implemented*
- *Distribute regular updates on projects and initiatives to key stakeholders*
- *Develop case studies that inform decision making*

3.3 Develop relationships to foster collaboration and

share learnings between regional organisations of councils and other key stakeholders

Actions:

- *Actively participate in the JONZA project*
- *Identify opportunities for collaboration to deliver projects and initiatives*

The REROC Member councils are well aware of the need to advocate to have the needs and perspectives of rural and regional communities considered by decision makers. This is a fundamental role for REROC. The objectives and actions under this theme reflect a key part of what REROC is already doing for Member Councils across an array of topics.

It is important that the voices of rural and regional NSW are heard when policy and program decisions are made at both State and Federal level. In order to facilitate that voice and to better collaborate at a State level, REROC has adopted Themes for this Plan that are aligned with the State Net Zero Plan.

One of the actions in this Theme is to actively participate in the Joint Organisation Net Zero Acceleration (JONZA) project. The JONZA program has provided funding for a Regional Energy and Net Zero Project Officer for REROC, and a similar position for 8 Joint Organisations. Through the JONZA program REROC is linked with the NSW Sustainable Councils program (Department of Climate Change, Energy, the Environment and Water) and knowledge sharing with the other JONZA officers and their groups of councils, creating possibilities for joint projects and funding applications.



Theme 4: Monitoring and Evaluation

Objective:

4.1 Measure energy savings and emissions reductions to demonstrate the value of investing in technologies and initiatives

4.1 Measure energy savings and emissions reductions to demonstrate the value of investing in technologies and initiatives

Actions:

- *Streamline data collection and reporting to provide robust and consistent information*
- *Use Smart Metering and where implemented Energy Management Systems (EMS) to measure benefits and support decision-making on projects*
- *Use data collected on energy savings and emissions reduction projects to:*
 - *prepare reports for councils that inform future investments*
 - *inform and prepare reports and applications for funding bodies*
- *Contribute to research studies*
- *Develop and distribute case studies*

It is important to measure the success of the energy efficiency initiatives that are implemented. Monitoring the progress of our projects to ensure they are on track, and evaluating the savings and benefits achieved, are key to councils' on-going commitment to energy and net zero outcomes. In addition, it is important that we share that information not just with the Member Councils but across the Local Government Sector and beyond.

Member Council staff with key responsibilities for energy have many other responsibilities as well. We want to ensure that they, and their team, have streamlined access to detailed energy usage data that can inform decision

making. This will enable the measuring of savings from implemented initiatives and the modelling of the savings from proposed initiatives. Good data can facilitate the evaluation of new applications of technologies, and the development of case studies to share learnings with others.

Increasingly, streamlined access to data is available through portals provided by retailers. These portals provide nearly instantaneous access to past invoices for a site, and to whatever detailed (interval) usage data is recorded by the meter.

Detailed interval data relies on smart metering. The tariff reviews noted in Theme 1 rely on the detailed data that a smart meter provides. In some cases, replacing old style accumulation meters with smart meters can in itself provide access to substantially cheaper time-of-use electricity tariffs.

Detailed interval data also supports the preparation of robust business cases for councillors on which to base their decisions on the implementation of energy efficiency initiatives. For example, NSW State government funding has provided access to a solar evaluation tool for council sites. The tool can process 12 months of detailed council electricity usage data for a site, and evaluate the costs and payback periods for different sizes of solar and battery systems. The modelling and business cases these tools provide can also be the basis for applications for State, Federal or other grants.

An Energy Management System (EMS) can process the data from an individual meter, or a set of meters, and present it graphically or in other ways that assist in identifying trends or notable aspects of a usage profile. An EMS can speed the identification of opportunities or issues.

Appendix 1 - REROC Council Profiles

The following council profiles note information drawn from the Australian Photovoltaic Institute (APVI) and from Snapshotclimate. The information from these two organisations is drawn from the relevant council page at the following sites:

- <https://pv-map.apvi.org.au/historical> (under “PV capacity by LGA”)
- <https://snapshotclimate.com.au/explore/>

Bland Shire Council

Population 5,494
Land Area 8,765km²
Number of Households 2,151

The Shire's "Message from the Mayor and Councillors" in its Community Strategic Plan includes the following:

"Council staff are committed to continuous improvement. Council is embracing new technology, new ideas and new initiatives for the betterment of not only the organisation but the wider community."

One of the strategies contained in the Bland Community Strategic Plan (CSP) is to "Support a sustainable environment for current and future generations..."

The CSP also contains advice for the community on how they can assist in implementing the Plan including:

*"Choose energy efficient building materials, appliances and vehicles";
"Use energy and water efficiently"; and
"Buy local and then re-spend locally – stop funds leaking out of our communities".*

The Australian PV Institute (APVI) estimates that approximately 35% of dwellings in the Bland LGA (June 2023) have a solar installation; that is, 974 household solar PV installations, averaging about 4.8kW per dwelling and totalling 4685kW. Additionally, APVI estimates that there are 181 business installations, averaging 17.5kW, that total 3180kW.

With normal yearly generation, and assuming electricity prices of \$.35/kWh and a 30% self-consumption of the electricity generated, residents and businesses in the Bland LGA would be saving about \$1.4 million each year with their solar installations.

As advised in the Community Strategic Plan, the savings from the community's rooftop solar may be considered one way that the community is buying locally, and probably also re-spending locally.

Bland LGA is also host to the West Wyalong solar farm of 108MW, the Wyalong solar farm of 75MW and a Pace Farms solar installation of 928kW.

Total emissions for the Bland LGA are estimated as 553,000 tonnes CO₂e (according to 2021-22 data on the Snapshotclimate site). The biggest portion of emissions (48%) are attributed to the generation and supply of Electricity for the LGA, with the next highest sources being Agriculture (26%, predominantly livestock) and Transport (23%). A substantial portion of the estimated emissions are likely due to the operations of the Lake Cowal mine.



While the emissions from Council are only a small fraction of total LGA emissions, Bland Council plays a leadership role in lessening emissions, embracing innovative technologies and implementing energy saving initiatives.

Bland Shire Council developed a Energy Saving Action Plan (ESAP) in 2021, with funding from NSW Sustainable Councils (NSW DCCEE).

The ESAP noted that Bland Council had already implemented numerous solar PV projects through onsite solar Power Purchasing Agreements (PPAs), including the following:

- 25kW solar PV installation at West Wyalong Effluent Reuse Pump;
- 10kW solar PV installation at West Wyalong Sewer Pump Station;
- 32kW solar PV installation at West Wyalong Sewage Treatment Plant
- 20kW solar PV installation at Bland Shire Depot;
- 20kW solar PV installation at Bland HACC;
- 10kW solar PV installation at Boundary Street Pump;
- 33kW solar PV installation at 6 Shire Street;
- 10kW solar PV installation at West Wyalong Sports Stadium;
- 7.8kW and 15kW solar PV installations at West Wyalong Pool;
- 15kW solar PV installation at Ungarie Pool;
- 7kW solar PV installation at Ungarie Treatment Works.

The ESAP included the following strategies:

- Council should seek to ensure that major new projects, or expansions are designed to be energy efficient, and to accommodate solar PV, Battery Energy Storage System (BESS) and EV charging to meet part of these developments' energy demands;
- buy Greenpower for electricity from the grid (aiming for 100% Greenpower by 2030);
- for the longer term, Council consider a mid-scale solar farm at the West Wyalong landfill.

Since the ESAP was completed, Bland has implemented a number of other ESAP recommendations and strategies. It has:

- entered into a Power Purchasing Agreement (PPA), as part of a consortium of councils, providing cost savings and security of price for years to come. Through this PPA, Bland is buying 25% Greenpower;
- participated in the Southern Lights LED upgrade of streetlighting;
- begun to purchase hybrid vehicles for the fleet, when cost effective.

Going forward, Bland Council prioritises a number of energy efficiency and low emissions initiatives, largely based on the ESAP:

- Investigate Battery Energy Storage System (BESS) opportunities across various facilities that already have established solar PV systems to store exported energy that would otherwise go to the grid; e.g. Council offices, Depot, Sewerage Treatment Plant (STP) and sporting facilities;
- Evaluate expanded rooftop PV system on Council's administration building with back up by a battery storage system, & an increase of the solar arrays at West Wyalong's Sewerage Treatment Plant, Ron Crowe Oval, & the Preschool;
- Investigate LED lighting upgrades across sporting facility sites, and for all administration buildings lighting to be replaced by LED as needed;
- Exercise due diligence prior to purchasing new fleet, especially as technology in transportation emerges. Council will be assessing all fleet purchasing options, e.g. hybrid and electric vehicles, as well as considering installation of EV charging stations;
- Investigate further solar power purchasing agreements from local solar farms.



Weethalle Silo Art Project - Photo courtesy of Bland Shire Council

Coolamon Shire Council

Population 4,465
Land Area 2,494km²
Number of Households 1,649

An underlying value in the Coolamon Community Strategic Plan (CSP) is the: *“commitment to strive for social, economic, and environmental sustainability for the benefit of future generations”*. The CSP states that:

“As a sustainable community we will make decisions today that allow us to hand the Shire to future generations in a better condition than it is in now. Our focus will be on thoughtful environmental custodianship...”

Planning for the future will include a focus on “climate change initiatives”.

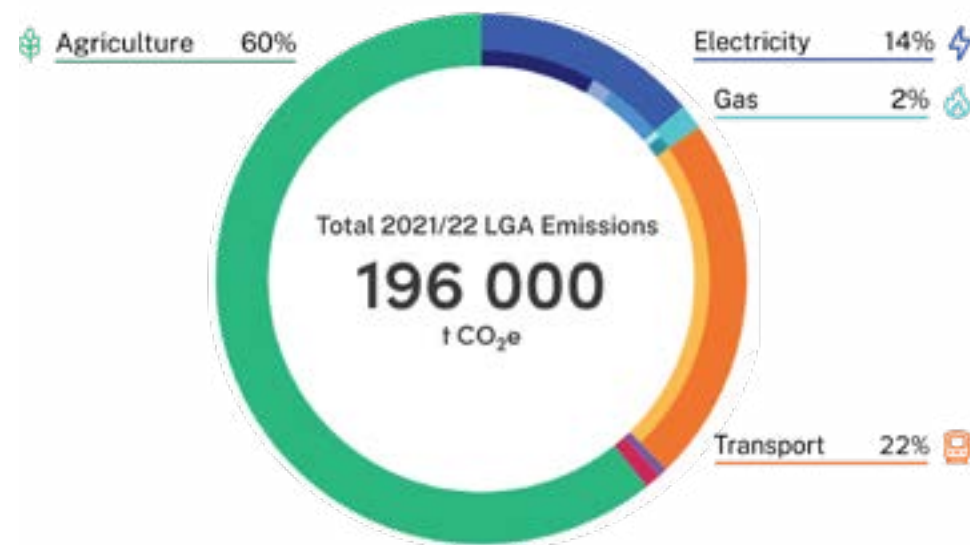
Additionally, the Coolamon’s Delivery Program and Operational Plan 2023-2027 includes a commitment to demonstrate leadership in relation to solar efficiency and to, *“Encourage solar energy usage by Shire communities”*.

The Australian PV Institute (APVI) estimates that approximately 39% of dwellings in the Coolamon LGA (June 2023) have a solar installation; that is, 724 installations averaging nearly 5kW each, totalling 3449kW. Additionally, the APVI estimates that there are 90 business installations, averaging 15.5kW, that total 1395kW.

With normal yearly generation, and assuming electricity prices of \$.35/kWh and 30% self-consumption of the electricity generated, residents and businesses in Coolamon LGA would be saving about \$860,000 each year with their solar installations.

Total emissions for the Coolamon LGA are estimated as 196,000 tonnes CO₂e annually (according to 21-22 data on the Snapshotclimate site). The majority of emissions (60%) are attributed to Agriculture (particularly to livestock), with the next highest sources being transport (22%) and the generation and supply of Electricity for the LGA (14%).

Emissions attributed to Council’s activities were less than 1% of the estimated total LGA emissions.



Coolamon Shire Council had an Energy Saving Action Plan (ESAP) developed in 2021, with funding from NSW Sustainable Councils (NSW DCCEE). The ESAP showed initiatives that Coolamon had already undertaken, included the installation of:

- 12kW solar PV at Coolamon Shire Community Centre;
- 30kW solar PV at Allawah Lodge;
- 20kW solar PV at Aitken-logan Dementia Wing;
- 20kW solar PV at Coolamon Sewerage Treatment Works;
- 4.3kW solar PV at Ardlethan Preschool;
- 10kW solar PV at Ardlethan Museum;
- 25 x 3.4kW solar PV at Allawah Village;
- LED lighting at most of Council’s facilities such as offices, sports centres, and depot.

Also, over 10 years ago Coolamon introduced kerbside FOGO (Food Organic & Garden Organic waste collections). The waste collected is processed into compost by Council, diverting organic waste from landfill and substantially reducing methane emissions that result from the decomposition of organic matter.

Coolamon Shire's ESAP identified the following priorities:

- *Power sharing/virtual power;*
- *Batteries;*
- *Energy efficiency, controllable pumps;*
- *PV upgrades and additions;*
- *Electric Vehicles;*
- *Monitoring of overall performance of current measures adopted.*

Since the ESAP, one of Coolamon Council's most significant initiatives in reducing costs and emissions has been the changeover to LEDs for streetlighting (with an estimated savings of 95 tonnes CO₂e/yr) through the Southern Lights project. Another was signing up with a consortium of councils for a Power Purchase Agreement (PPA) with Iberdrola. This began on 1 Jan 2023 and provides electricity price savings and security against electricity price rises for 8 years, as well as making practical the purchase of 50% Greenpower for Coolamon Council's large sites.

Additional completed initiatives include:

- change of heritage lights in Coolamon and Ardlethan to LED technology;
- installation of 4kW solar on Lyons Park; and
- installation of solar PV on the Ganmain Hall.

Coolamon Council has been gradually installing heat pumps – reverse cycle individual units - in residents' rooms in Allawah Lodge. Allawah Lodge is an aged care facility owned and operated by Council.

Coolamon has set aside funding in its current budget to pursue further energy initiatives, e.g. possibly battery storage to complement the existing solar at the pool or other site.

Coolamon has also allocated resources in the 2023-24 year for energy efficiency measures for four new cabins in the Council owned caravan park, including LEDs & heat pump hot water systems.

Carbon footprint from energy use

Coolamon Council's carbon footprint from energy in 2021 was approximately 1485 tonnes CO₂e.

After the reduction in emissions due to the change of streetlighting to LED, new solar systems and other energy efficiency initiatives, the emissions from electricity use are estimated to have dropped by close to 40% of Council's total emissions from energy use.

Emissions from transport in 2020 were estimated as 816 tonnes CO₂e:

- Diesel - 796 tonne CO₂e (including scope 3)
- Petrol - 20 tonne CO₂e (including scope 3).

Assuming the same number of litres of fuel continue to be used, transport emissions would have risen as a percentage of total Council emissions from energy use, possibly as high as 60%. As with many of the REROC Member Councils, Coolamon's success in reducing emissions from its electricity use has meant that transport emissions have become a more significant proportion of its overall emissions.

Coolamon Shire Council has two hybrid vehicles on order and one plug-in hybrid is being considered for the Riverina Regional Library. Council has also installed two dual port destination chargers, which both promote tourism and local electric vehicle ownership.



*Coolamon NSW 2701
Photo courtesy of Amy Curran*

Cootamundra-Gundagai Regional Council

Population 11,404
Land Area 3,981km²
Number of Households 4,490

The Cootamundra-Gundagai Community Strategic Plan (CSP) recognises Council's lead role in strategies to:

- *"Investigate and implement renewable energy technologies to reduce environmental impact..."*;
- *"Encourage energy and resource efficiency initiatives..."*.

One of the Five Key Focus Areas contained in the CSP is:

"We are a prosperous and resilient region providing opportunities for growth and learning to strengthen and grow our economy, support tourism, and adopt new technologies to ensure long term sustainability."

The CSP also recognises that renewable energy is one of the Region's main industries.

The Australian PV Institute (APVI) estimates that approximately 34% of dwellings in the Cootamundra-Gundagai LGA (June 2023) have a solar PV installation. It estimates there are 1875 household installations with an average of 4.7kW each, totalling 8786kW. Additionally, there are an estimated 279 business installations, averaging 17.8kW, that total 4964kW.

With normal yearly generation, and assuming electricity prices of \$.35/kWh and a 30% self-consumption of the electricity generated, residents and businesses in the Cootamundra-Gundagai LGA would be saving about \$2.4 million each year with their solar installations.

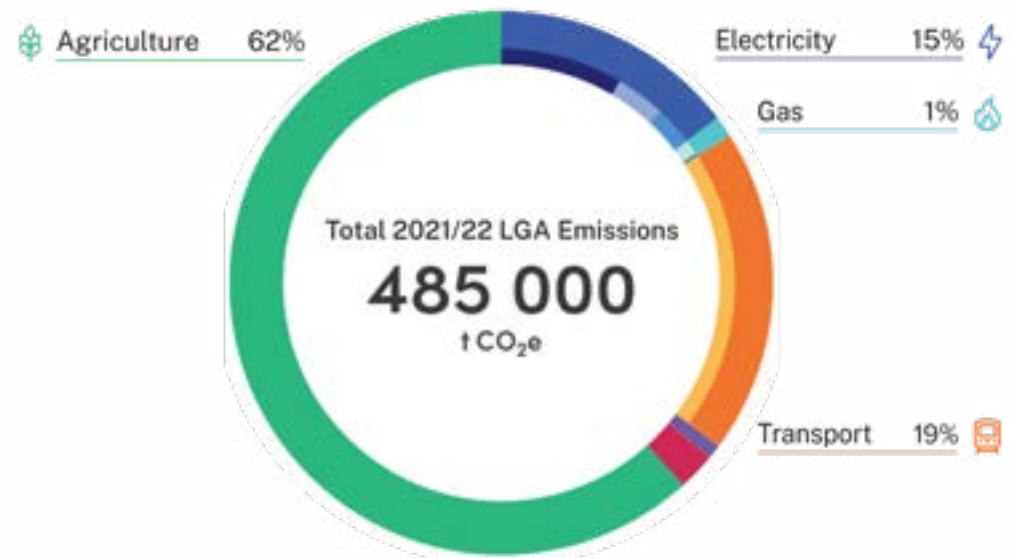
The LGA has a number of larger solar PV installations that are DA approved and/or constructed:

- *Cootamundra Oil Seed installation of 469kW;*
- *Five megawatt Solar Farm and Battery Storage Facility at 101-173 Cowcumbra St Cootamundra (under construction);*
- *Four megawatt Solar Farm at 167 Five Mile Creek Road Gundagai*

(Development Consent issued);

- *Twelve megawatt Solar Farm on Gundagai Road, Cootamundra (Development Consent issued);*
- *State Significant DA lodged with NSW Government for Jeremiah Wind Farm (65 turbine wind farm and battery energy storage system, SSD-22472709);*
- *State Significant DA lodged with NSW Government for Clara Energy Project (proposed Hydrogen production facility, including a 250 megawatt Solar farm, Rosedale Road Gundagai, SSD-60657974).*

Total emissions for the Cootamundra-Gundagai LGA are estimated as 485,000 tonnes CO₂e (according to 2021-22 data on the Snapshotclimate site). The majority of emissions (62%) are attributed to Agriculture (predominantly to livestock), with the next highest sources being Transport (19%) and the generation and supply of Electricity for the LGA (15%).



Cootamundra-Gundagai Regional Council had an Energy Saving Action Plan (ESAP) developed in 2021, with funding from NSW Sustainable Councils (NSW DCCEE).

The ESAP noted that Council had already taken steps to improve energy efficiency and lower emissions through:

- *installing solar PV systems at a number of Council sites including*
 - *a 20kW system at the Gundagai Works Depot;*
 - *a 20kW system at the Gundagai Admin Building;*
 - *a 10kW system at the Cootamundra Showground;*
 - *a 10kW system at the Cootamundra Stadium;*
- *upgrading to energy efficient lighting at different Council sites;*
- *renegotiating Council's energy contract.*

The ESAP recommended further energy efficiency measures (including lighting upgrades, Variable Speed Drives for pumps & upgrades to the efficiency of the pools), nine further solar PV installations, and the incorporation of solar generation in proposed renovations of Council facilities.

Since the ESAP was completed Cootamundra-Gundagai Regional Council has:

- *taken up a Power Purchasing Agreement (PPA), as part of a consortium of councils, providing security of a discounted electricity price for years to come. The Green energy component is targeted at 25%;*
- *upgraded streetlights to LED through the Southern Lights project (with annual savings in the vicinity of \$80,000);*
- *installed a solar PV system - approximately 30kW - for the Gundagai Sewerage Treatment Plant (STP);*
- *upgraded lighting to LED as part of refurbishment of the Gundagai Administration Building;*
- *partially changed over to LED in the Mirrabooka Library and Centre;*
- *begun upgrading the lighting of the Gundagai Visitor Centre;*

- *solar pathway lighting under construction at Jubilee Park;*
- *completed some changeover to LED lighting at Fisher Park/ Cootamundra Sports Stadium;*
- *installed energy efficient hot water units at Cootamundra Pool to complement existing solar heating.*

Priorities going forward include:

- installing variable speed pumps and solar PV at the Water Treatment Plant (WTP);
- investigating options for installing solar PV as well as upgrading lighting to LED as part of a refurbishment of the library at the Cootamundra Administration Building, which also includes the Council Chambers;
- installing of solar PV and LED upgrades at Council Depots;
- upgrading pumps and considering potential solar options at the Cootamundra Sewer Plant;
- (long term) installation of solar PV on all council buildings and upgrading lighting to LED;
- investigating heating/cooling systems to find more efficient systems;
- installing solar lighting to pathways through parks and walking tracks.

As stated in the Energy Saving Action Plan:

“Cootamundra-Gundagai's energy vision [through the actions of the ESAP] is to:

- *Reduce electricity cost to Council by 33% compared to 2019 (\$195,000 p.a.);*
- *Reduce our grid energy usage by 42% compared to the 2019 baseline;*
- *Supply 33% of its electricity with self-generated renewable energy.”*



Gundagai NSW 2722 - Image used under license from Henry During/Shutterstock

Goldenfields Water County Council

Goldenfields Water County Council supplies retail drinking water directly to almost 11,000 rural, residential, commercial, and other properties in the South West Slopes and Riverina regions. Goldenfields Water also supplies bulk water services to Hilltops and Cootamundra-Gundagai Councils and Riverina Water County Council. Its supply system covers over 22,500 square kilometres and services over 45,000 people. REROC Councils make up five (5) of the seven (7) Councils that Goldenfields Water services.

Goldenfields' Business Activity Strategic Plan 2022-2032 includes:

- *the planning principle that "Infrastructure and policies should protect environmental outcomes by reducing pollution, balancing resource consumption, conserving natural ecosystems and resources, and supporting climate mitigation and adaptation";*
- *the strategic outcome of "Energy costs and usage are monitored and reduced through utilisation of alternative technologies and system innovations."*

The Goldenfields' Annual Report 2021-2022 stated:

- *"We regularly review energy use to proactively identify and implement usage reduction activities to lower costs and reduce carbon foot print";*
- *"Council currently maintain systems for monitoring its energy and greenhouse gas production. This system is designed to highlight any anomalies and to provide historical trends of councils energy usage".*

The electricity used to run Goldenfields' extensive network - particularly the water purification and pumping facilities - and associated administration substantially exceeds the energy consumption of the other seven (general purpose) councils in REROC combined. On average Goldenfields consumes around 14,000MWh of energy per annum with its individual assets of operation ranging between 15kW to 3.15MW sites. The energy

to run Goldenfields' assets comes at an average annual cost of around \$3 million. It is notable that around fifty percent of this cost is attributed to network charges and not usage.

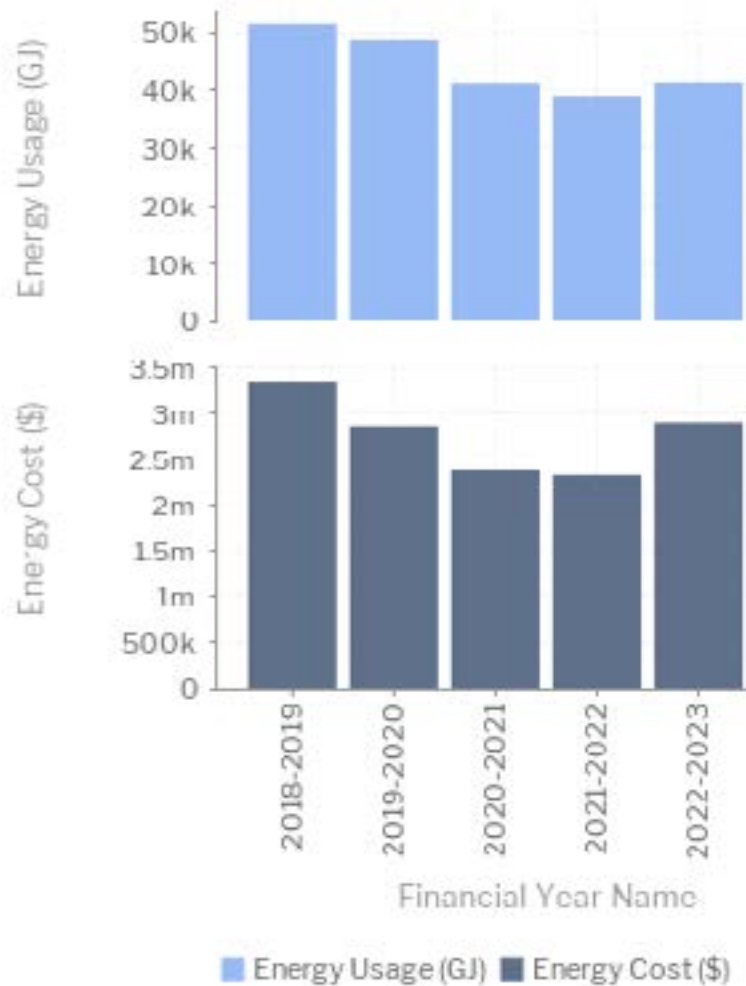
Goldenfields has undertaken and is undertaking many initiatives in order to reduce the energy use and associated emissions. Viable applications, however, are restricted, given Goldenfields' size and the requirements in providing essential water supply services across a regional landscape. Among the most significant of these initiatives are:

- *re-strategisation of the Goldenfields distribution network that was historically designed with significant mechanical systems included. Goldenfields has a short to medium term plan to invest significant CAPEX into augmenting the system to include fixed gravity applications to assist with the elimination of fixed mechanical assets that are energy intensive;*
- *significant investments made in automating Goldenfields' systems via SCADA and Telemetry applications, that also seeks to manage tariff control and applications of Demand Response whereby they have the ability to load shed their energy usage to gain a potential income stream to alleviate the cost burden of energy supply;*
- *investigations and intentions to invest in Battery Energy Storage Systems for their large High Voltage sites;*
- *replacement of all aged mechanical systems with newer more efficient operating systems.*

Whilst Goldenfields Water has made significant investments to reduce energy consumption, even with the reductions achieved Goldenfields' service is an energy intensive operation. Energy savings based upon the previous five years of operation are depicted in the graph below, highlighting the significant rise in cost for similar annual consumption. It should be noted that energy consumption closely correlates to an increase in population over time and/or demands for water supply. The trend to lower total energy use in the graph below has been in spite of a gradual

increase in the volume of water delivered through population growth and significant cost increases in energy prices.

Annual Energy Usage and Cost



The ongoing program to change from mechanical to gravity systems is estimated at around \$130 million over the next 10 years. This high capital investment, particularly in long-life assets such as pipelines and storage reservoirs, will minimise energy use for many years to come.



The Jugiong Water Treatment Plant, Jugiong NSW 2726 - Photo courtesy of Goldenfields Water County Council

Greater Hume Council

Population

11,267

Land Area

5,749km²

Number of Households

3,936

Greater Hume's Community Strategic Plan includes the following Outcomes of:

- *"Our liveability boosts quality of life for today's and future generations";*
- *"Our infrastructure and facilities are maintained and built in harmony with the natural environment";*

and includes the Strategy of:

- *"Support local adoption of clean energy solutions."*

Greater Hume's outcomes and strategies are supported in the Delivery Program and Operational Plan through the implementation of the following initiatives:

- *"Promote programs to enable citizens to adopt energy efficiency and renewable energy technologies";*
- *"Continue to implement the Greater Hume Energy Savings Action Plan and investigate the feasibility of further expansion of solar photovoltaic systems and batteries at various community facilities";*
- *"Review opportunities to support electric vehicle charging points at Council offices and depots to facilitate integration of electric vehicles into Council's fleet."; and*
- *"Develop a sustainable purchasing policy to ensure procurement of material containing recycled content."*

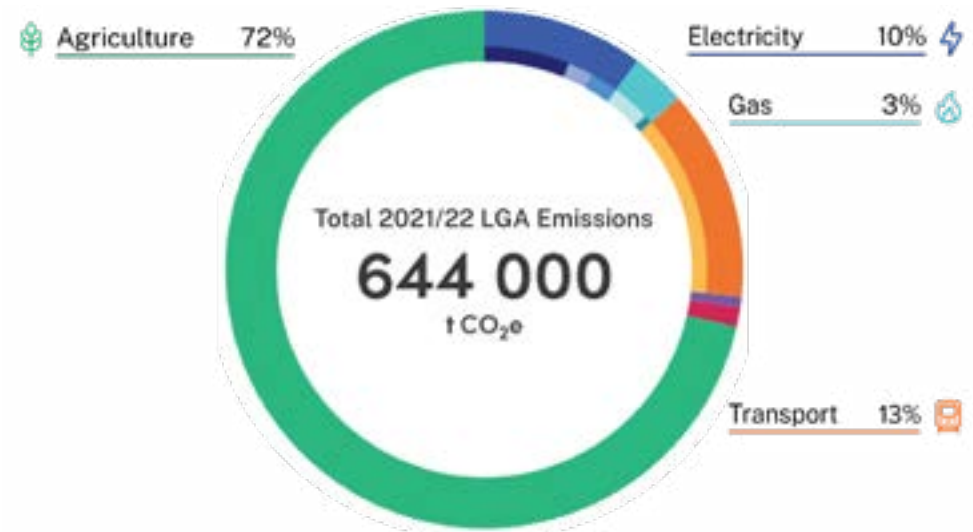
The Australian PV Institute (APVI) estimates that approximately 44% of dwellings in the Greater Hume LGA (June 2023) have a solar PV installation. APVI estimates there are 2088 household installations with an average capacity of about 5kW, totalling 10,322kW. Approximately 279 businesses are estimated to have solar PV as well, averaging about 18kW and totalling 5,010kW.

With normal yearly generation, and assuming electricity prices of \$.35/kWh, 30% self-consumption of the electricity generated, and payments of \$.03/kWh for electricity exported, residents and businesses in the Greater Hume LGA would be saving over \$2.5 million each year with their solar installations.

In addition, Greater Hume LGA is the location of four approved solar farms that will have a total capacity of 970MW when fully operational. It is expected that construction of the solar farms will commence during 2024.

Total emissions for the Greater Hume LGA are estimated as 644,000 tonnes CO₂e (according to 2021/22 data on the Snapshotclimate site). The majority of LGA emissions (72%) are attributed to Agriculture (predominantly livestock), with the next highest sources being Transport (13%) and the generation and supply of Electricity for the LGA (10%) .

While the emissions from Council are only a small fraction of total LGA



emissions, Greater Hume Council plays a leadership role in lessening emissions, embracing innovative technologies and saving costs.

Greater Hume Council developed an Energy Saving Action Plan (ESAP)

in 2021, with funding from NSW Sustainable Councils (NSW DCCEEW). The ESAP laid out Council's energy vision to reduce its electricity costs by 40% compared to 2019 levels.

When the ESAP was completed in 2021, Greater Hume Council had already:

- *upgraded streetlights in Greater Hume to LED through the Southern Lights project, reducing "Council's overall energy consumption by 15% (approximately 250MWh p.a.) and reducing electricity costs by \$44,000";*
- *"invested in 381 kW of solar PV across 17 sites", predominantly in 2021, with expected savings of nearly \$70,000 p.a;*
- *renegotiated electricity contracts as a member of REROC, which achieved a 5% reduction in electricity costs.*

The ESAP proposed actions including:

- *installations of solar PV, battery, and back up generation for Energy Resilience at four Council sites;*
- *establishment of a Revolving Energy Fund and use of an energy management system and dashboard;*
- *a trial of electric vehicles for Council leaseback vehicles that travel high kilometres, with required charging infrastructure.*

Guided by the ESAP, Council has completed the following projects:

- *installed a 20kW solar PV and 30kWh battery system at the Brocklesby Recreation Grounds. This avoided an upgrade of the network for the new building, the savings exceeded the costs of the system in the first year, with the system to provide free energy for decades to come;*
- *installed a 10kW solar PV, 40kWh battery and a back up generator at the Wymah Recreation Grounds to provide for the needs of the facility, particularly in times of emergency;*
- *joined with a consortium of other councils for a power purchasing agreement (PPA) for its large sites and streetlighting, saving costs and providing security against price fluctuations for several years;*
- *while still saving on costs, Council has committed to 50% greenpower as part of the PPA.*



Holbrook NSW 2644 - Photo courtesy of Leanne Bickley

Junee Shire Council

Population 6,465
Land Area 2,030km²
Number of Households 2,103

Junee Shire Council's Delivery Program and Operational Plan shows its commitment to:

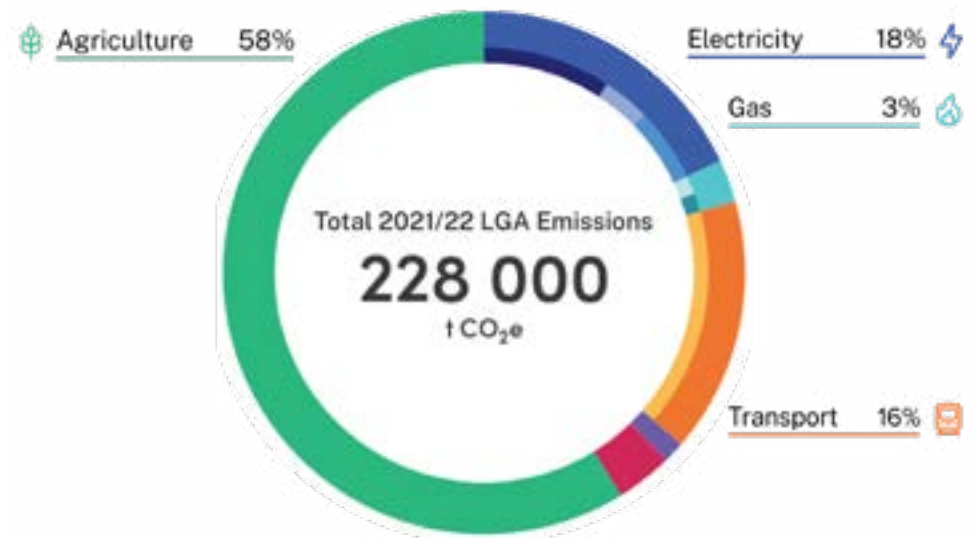
- *“lead by example with innovative technologies and processes, including energy management and environmental sustainability”;*
- *“manage our human, built and financial resources wisely ... embracing energy efficiency and reducing, reusing and recovering waste”;*
- *“Reduce the Council's Greenhouse Gas footprint”.*

The Australian PV Institute (APVI) estimates that approximately 35% of dwellings in the Junee LGA (June 2023) have a solar PV installation. APVI estimates there are 820 installations of an average of approximately 4.5kW each, totalling 3688kW. Additionally, APVI estimates that there are 74 business installations, averaging over 21kW, that total 1599kW.

With normal yearly generation, and assuming electricity prices of \$.35/kWh and a 30% self-consumption of the electricity generated, residents and businesses in the Junee LGA would be saving about \$950,000 each year with their solar installations.

Within Junee LGA there is also a managed solar farm of 39 MW.

Total emissions for the Junee LGA are estimated as 228,000 tonnes CO₂e (according to 2021-22 data on the Snapshotclimate site). The majority of emissions (58%) are attributed to Agriculture (predominantly to livestock), with the next highest sources being the generation and supply of Electricity for the LGA (18%) and transport (16%).



Junee Shire Council has been providing kerbside FOGO (organics collection) since 2012, reducing the organics that go to landfill and thus reducing the greenhouse gas methane that is the result of the organic material decomposing.

Council has secured a 100% renewal electricity contract for its large site electricity contract and 80% renewable electricity contract for its small sites contract.

Installation of Solar PV at the following community facilities include:

- 8kW system at the Junee Community Centre
- 6kW system at the Illabo Hall
- 6kW system at the Junee Reefs Hall
- 5kW system at the Old Junee Hall
- 5kW system at the Junee Senior Citizen Hall
- 20kW system at the Athenium Theatre
- 99kW system at the Junee Sewage Treatment works

Junee Shire Council's passenger vehicle fleet is predominantly made up of hybrid and EV vehicles.

Junee Shire Council's pathway towards engaging in renewable energy practices is expressed in its Renewable Energy Action Plan 2021, developed with funding from NSW Sustainable Councils (NSW DCCEEW). Some of the strategies have been implemented while others require ongoing investigation.

Energy transparency – smart metering and control (Completed)

This has been a priority initiative for Council as it provides visibility on existing energy consumption leading to energy efficiency measures and allows Council additional control.

Junee Junction Recreation and Aquatic Centre behind-the-meter solar and battery installation (Incomplete)

Developing a detailed business case for rooftop solar at Junee Junction Recreation and Aquatic Centre including detailed modelling with energy storage (batteries) and an EV charging station. This includes a 99kW system with batteries. This work is planned for completion in 2024/25.

Council also plans to replace the gas boilers at the Junee Junction Recreation and Aquatic Centre, when they reach end-of-life (2032), with electric heat pumps.

Electric Vehicles - Council to invest in installation of an EV charging station(s) (75% complete)

This initiative is in response to the Renewable Energy Action Plan recommendation that Council consider replacing its passenger vehicle fleet with hybrid and EV vehicles over time and identify the most suitable location to install EV public accessible charging stations.

Medium Scale Solar 1.5MW (Incomplete)

Based on land/network availability there is no immediate case for a medium scale solar installation, however Council will continue its investigations as it aligns with Council's longer term objectives.

Council also participated in the Southern Lights program that has successfully changed over all streetlighting to LEDs, which has resulted in a substantial reduction in electricity use and associated emissions.

Council continues to support Junee Community Power Inc., which is a not-for-profit organisation with an objective to save households from rising energy costs by conducting home energy audits. Longer term, Junee Community Power want to facilitate the establishment of a community circular fund to help community bodies install solar PV by supplying the upfront capital which is then repaid, interest free, out of the energy savings over a 5-7 year period.



Junee Roundhouse Museum - Photo Courtesy of Junee Shire Council

Lockhart Shire Council

Population 3,370
Land Area 2,896km²
Number of Households 1,202

Lockhart Shire Council's commitment to reducing emissions and increasing energy efficiency and sustainability more broadly is reflected in the Lockhart Shire Community Strategic Plan 2022-2032 (CSP) and Delivery Plan 2022-2025. The CSP is based on five objectives, one of which is:

C1: Our environmental practices are sustainable.

This is supported in the Delivery Plan by actions including:

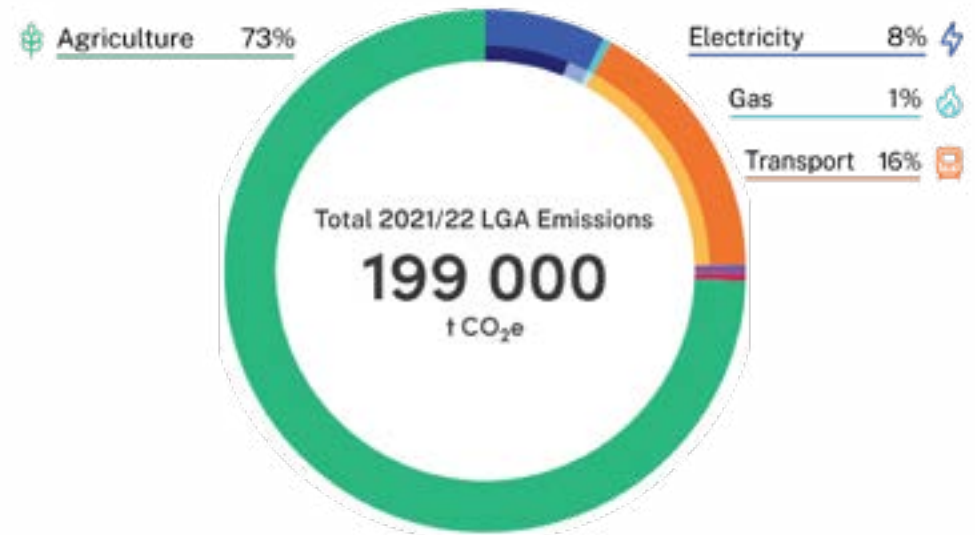
- "Where practical improve the energy efficiency of Council buildings."
- "Implement Council's adopted Energy Savings Plan including installation of solar panels at the sewerage treatment plants and swimming pool complexes."
- "Develop and implement a strategy that works towards Lockhart Shire being carbon neutral."
- "Investigate programs and initiatives that promote renewable energy options for households and industry."

The Australian PV Institute (APVI) estimates that approximately 42% of dwellings in the Lockhart LGA (June 2023) have a solar PV installation. APVI estimates there are 614 installations of an average of nearly 5kW each, totalling 2982kW. Additionally, there are 77 larger installations, averaging 15.5kW, that total 1197kW.

With normal yearly generation, and assuming electricity prices of \$.35/kWh and a 30% self-consumption of the electricity generated, residents and businesses in the Lockhart LGA would be saving over \$745,000 each year with their solar installations.

Total emissions for the Lockhart LGA are estimated as 199,000 tonnes

CO₂e (according to 2021-22 data on the Snapshotclimate site). The majority of emissions (73%) are attributed to Agriculture (predominantly livestock), with the next highest sources being Transport (16%) and the generation and supply of Electricity for the LGA (8%).



A plan for a microgrid project for Lockhart received \$1 million in Federal funding in 2019. With a mid-scale (10MW) solar farm and a 25MWh battery planned, the project could make the town of Lockhart self-sufficient in terms of electricity. Lockhart Shire Council has supported the project, developed by a private entity, which now appears to have achieved the connection approval for the solar farm. A conditional clause 5.4.3A approval was issued by the Australian Energy Market Operator (AEMO) to the developer on 4 August 2023 after AEMO completed its assessment of the proposed access standards under the National Electricity Rules (NER) for the proposed Lockhart Hybrid Power Plant.

Lockhart Shire Council developed an Energy Saving Action Plan (ESAP) in 2021, with funding from NSW Sustainable Councils (NSW DCCEEW). The ESAP laid out a path for the Council to reduce energy costs by 29%,

and reduce energy consumption by 31%, through initiatives in:

- *“Energy efficient lighting*
- *Tariff optimisation & energy efficiency*
- *[An] expanded solar PV program.”*

Lockhart Shire Council has undertaken a number of the actions recommended in the ESAP. As part of the Southern Lights project, Council converted its streetlighting to LEDs, leading to savings estimated in the ESAP to be 93 MWh p.a., or 15% of Council’s overall energy consumption.

Implementation of the ESAP relating to the installation of solar panels at the sewerage treatment plants and swimming pool complexes wants incorporated into Council’s 2023/24 Operational Plan and Budget.

Prior to the ESAP, Lockhart Shire Council had already deployed a solar PV installation of 18kW on the Council Administration building, which supplies 40% of the energy usage at the site.

Council has also taken a leadership position in the purchase of one battery electric vehicle (EV) and three plug-in hybrid vehicles. Additionally, Council has installed two chargers at the Council Admin building as well as two other destination chargers in Lockhart and one at The Rock pool.

The destination chargers promote tourism and send a clear message to the community that electric vehicles are coming to be a normal part of life.

Lockhart Shire Council has also provided kerbside FOGO (food organics garden organics collection) since 2019, reducing the organics that go to landfill and produce the potent greenhouse gas methane when decomposing.

Priorities going forward:

- *Installation of solar panels at The Rock swimming pool complex*
- *Installation of solar panels at The Rock sewerage treatment plant*
- *Evaluation of renewables or cost saving options that emerge from or complement the Lockhart microgrid project*



Lockhart Water Tower Art
- Photo Courtesy of Cathy Robinson via Lockhart Shire Council

Temora Shire Council

Population 5,996
Land Area 2,802km²
Number of Households 2,393

Strategic objectives contained in the Temora Shire Council Community Strategic Plan (CSP) affirm that the community is one that “strives to minimise its environmental impacts” and “sustainably plans for its future.” The CSP includes a strategy to “Decrease carbon emissions into the atmosphere”.

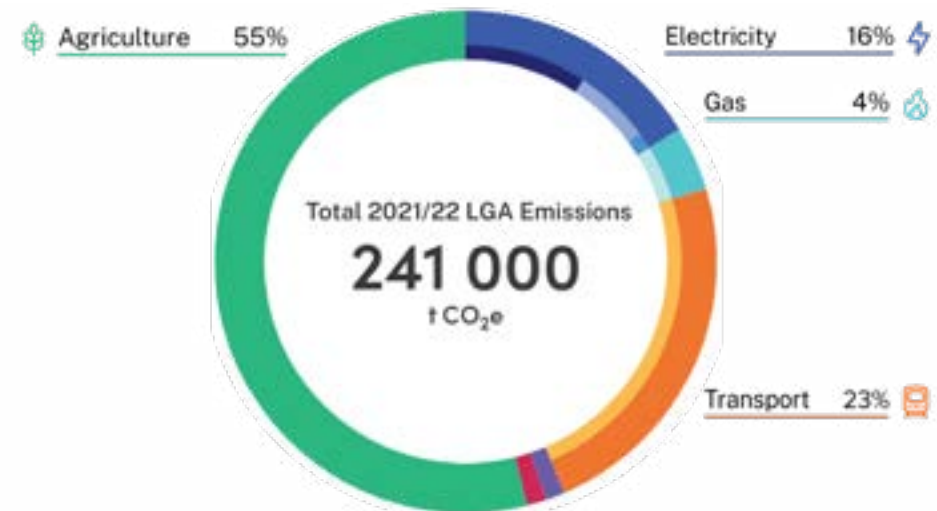
Similarly, the Temora Shire Council Delivery Plan adopts the value of “Future Custodianship – we will always act with consideration of the impact of our actions on future generations”. The Delivery Plan includes an action to, “Utilise solar power system installation where economic.”

The Australian PV Institute (APVI) estimates that approximately 32% of dwellings in the Temora LGA (June 2023) have a solar PV installation. APVI estimates there are 879 installations of an average of about 5kW per dwelling, totalling 4360kW. APVI also estimates that there is solar PV capacity of 2733kW across 151 business solar PV installations (between 10 and 100kW).

With normal yearly generation, and assuming electricity prices of \$.35/kWh and a 30% self-consumption of the electricity generated, residents and businesses in the Temora LGA would be saving over \$1.2 million each year with these solar installations.

The Temora LGA hosts the Sebastopol solar farm (111MW) and the Woolworths Temora solar installation of 291kW. The 15MW solar farm at Gidginbung and the 6.4MW solar farm on Moroney’s Lane have received development consent but construction has not commenced.

Total emissions for the Temora LGA are estimated as 241,000 tonnes CO₂e annually (according to 2021-22 data on the Snapshotclimate site). The majority of emissions (55%) are attributed to Agriculture (predominantly to livestock), with the next highest sources being Transport (23%) and the generation and supply of Electricity for the LGA (16%).



While the emissions from Council are only a small fraction of total LGA emissions, Temora Shire Council has been playing a leadership role in lessening emissions, embracing innovative technologies and saving costs.

Council had an Energy Strategy and Action Plan (ESAP) developed in 2020, with funding from NSW Sustainable Councils and Communities (NSW DCCEEW).

When the ESAP was prepared, Council had already undertaken some renewable energy and energy saving initiatives, including:

- installation of a 36.7kW solar PV at the Council Admin building
- installation of a 36.7kW solar PV at the Council Medical Centre;
- installation of a 15kW solar PV at the Council Works Depot;
- installation of a 13kW solar PV at the Temora Recreation Centre;
- installation of a 30kW solar PV at the Council Library;
- upgrading of five recycled water pump stations to variable speed drive pumps.
- upgrading of most Council buildings to LED lighting.

Key strategies recommended in the ESAP included:

- *installation of solar PV on particular Temora Council facilities, and later installation of battery systems;*
- *energy efficiency actions, such as upgrading to LEDs & variable speed drive pumps (VSD);*
- *heat pumps – consider replacing gas boilers for the indoor pool with heat pump heating;*
- *changes of electricity tariffs to reduce costs.*

The ESAP notes, “Transport emissions are the second largest GHG source for Temora Shire Council, primarily from diesel used for Council’s operational vehicles. Petrol use for passenger cars is the third largest GHG source for Temora Shire Council.” The ESAP recommends monitoring the quickly evolving hybrid and electric vehicle options and switching the fleet to these options as feasible. At the time, emissions from vehicle use made up about 40% of Council’s emissions from energy use.

Since the ESAP was produced, Temora Shire Council has:

- *taken up a Power Purchasing Agreement (PPA), as part of a consortium of councils, providing cost savings and security of price for years to come;*
- *upgraded streetlights to LEDs*
- *installed solar PV at a number of sites, including -*
 - *26.4kW solar PV at the Bundawarra Centre*
 - *22.88kW solar PV (ground mounted) at the Research Station*
 - *60.8kW solar PV (ground mounted) at the Temora Sewerage Treatment Plant*
 - *6.3kW solar PV at the units next to medical imaging*
 - *6.3kW solar PV at the Airport units and Sewer Pump Station*
 - *19.8kW solar PV at the Aerodrome (grid operator limited size)*
 - *13.2kW solar PV at the Aria Park Pool.*
 - *15.3kW solar PV at Councils Supported Independent Living house*
 - *9.9kW solar PV at Pinnacle House*
 - *6.6kW solar PV at the Temora Art Centre*

Also, for 2023/24, solar has been funded for the Junee Road Caravan Park.

In addition, Council has replaced gas boilers with electric heat pump heating at the Temora indoor pool. Many councils with heated pools are considering making this move, in line with the prominent public messaging about the need for electrification of households and businesses as a key strategy to move quickly towards net zero emissions.

Temora Council has been using an Energy Management System (Azility) since 2014, which enables easy access to energy data and hence streamlines evaluation of energy initiatives.

Council has also been using Solar Analytics software to monitor its solar PV systems since 2020.

Council energy and cost saving priorities going forward include:

- deployment of solar PV while economics and network access are good (considering capital cost, STCs, and feed in tariffs);
- public EV charging facilities and investigation of feasibility of adopting electric vehicles for different uses in the Council fleet;
- development of a formal Revolving Energy Fund;
- further energy savings projects in LED lighting, HVAC (heating-ventilation-and-conditioning), VSD (Variable Speed Drive pumps);
- exploration of innovative and sustainable energy models opening up potential for Council and community benefit. This could include, but is not limited to; virtual net metering, community solar, aggregated procurement, etc.



*Temora Aviation Museum Warbirds Downunder,
Temora NSW 2666 - Photo courtesy of Peter Morris*

Glossary of Terms

AEMC – Australian Energy Market Commission

AEMO – Australian Energy Market Operator

AER – Australian Energy Regulator

APVI – Australian Photovoltaic Institute

ARENA – Australian Renewable Energy Agency

CO₂e – carbon dioxide equivalent, a metric that represents the global warming potential of different atmospheric gases in terms of the warming effect of CO₂

CSP – Community Strategic Plan

DCCEEW - NSW Department of Climate Change, Energy, the Environment and Water

EV – electric vehicle (here used to refer to fully electric vehicles, not Hybrid vehicles)

FOGO – Food Organics Garden Organics (organic waste collection)

kW – kilowatt, a unit of power (one thousand watts)

kWh – kilowatt-hour, a unit of energy (e.g. one kilowatt of power running consistently over one hour)

EMS – Energy Management System

ESAP – Energy Saving Action Plan (or Energy Strategy and Action Plan), a plan for energy efficiency, renewable energy and emissions saving opportunities based on an audit of energy use in a council's facilities and operations

Greenpower – a Federal Government accredited system in which a business or household can pay a premium for electricity generated from renewable sources such as wind or solar

GW – gigawatt, a unit of power (one billion watts)

GWh – gigawatt-hour, a unit of energy (e.g. one GW running consistently for one hour)

Hybrids – vehicles that have both a petrol or diesel engine and an electric motor

JONZA – Joint Organisation Net Zero Acceleration (an initiative of NSW Sustainable Councils, under the NSW Department of Climate Change, Energy, Environment and Water - DCCEEW)

LED – Light Emitting Diodes, a highly efficient form of lighting

LGA – Local Government Area

LGNSW – Local Government NSW, an independent organisation that exists to serve the interests of New South Wales general and special purpose councils

MW – megawatt, a unit of power (one million watts)

MWh – megawatt-hour, a unit of energy (e.g. one MW running consistently for one hour)

NEM – National Energy Market, which comprises the electricity networks of Queensland, New South Wales, the Australian Capital Territory, Victoria, South Australia, and Tasmania

Net Zero – refers to achieving an overall balance between greenhouse gas emissions produced and greenhouse gas emissions taken out of the atmosphere

NSW Sustainable Councils – a program under the NSW Office of Energy and Climate Change (OECC) until 1 January 2024 when Sustainable Councils became part of NSW DCCEEW

PPA – Power Purchase Agreement, through which buyers such as a consortium of councils agree to buy renewable energy from a generator (such as a wind or solar farm) at an agreed price for an agreed period

PV – photovoltaic. Photovoltaic cells convert sunlight directly into electricity

OECC – NSW Office of Energy and Climate Change, which became part of NSW DCCEEW on 1 January

2024

REAP – Renewable Energy Action Plan (see also ESAP – Energy Saving Action Plan)

Renewable Energy – Energy produced using natural resources that are renewed by natural processes

REROC – Riverina Eastern Regional Organisation of Councils

Smart Meters – A smart meter is a type of electricity meter that measures how much electricity is used in each interval (e.g. every 5 or 30 minutes). A smart meter can be read remotely and usually transmits the information digitally to the retailer daily

Smart Metering – implementing smart meters

Smart charging (or smart timing of charging) – timing the charging of an electric vehicle in a way that is responsive to surplus rooftop solar generation, spare capacity of a building's electrical system, low grid electricity prices, etc.

STP – Sewerage Treatment Plant

TCO – Total Cost of Ownership, representing the total costs of a product over the period of ownership, including operating costs and capital costs, and minus any income from the sale of the item

tCO₂e – tonne CO₂e, carbon dioxide equivalent

Virtual Net Metering – when excess generation at one site is notionally supplied to another site, which can provide cost savings for the consumer

VPP - a Virtual Power Plant orchestrates resources (such as rooftop solar, battery storage or controllable loads) to deliver energy to the grid for electricity markets

REROC

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