100% renewables

CENTRAL NSW JOINT ORGANISATION

NSW GOVERNMENT

Central NSW Joint Organisation

Emissions Reduction Plan: Regional Opportunities

Final report

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www.100percentrenewables.com.au

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1 Executive summary

100% Renewables was engaged by Central NSW Joint Organisation (CNSWJO) through NSW Government Office of Energy and Climate Change's (OECC's) Sustainable Councils program, to develop Emissions Reduction Plans (ERPs) for Bathurst Regional Council and for Cabonne Council. In addition to the development of ERPs, CNSWJO commissioned the development of a ***Regional Opportunities Report***, to identify actions and opportunities from ERPs that could be pursued by member councils that achieves efficiencies and economy of scale through a collaborative approach.

In preparing this Regional Opportunities Report, 100% Renewables also draws on previously developed Renewable Energy Action Plans (REAPs) for Weddin Shire Council and Oberon Council through a similar engagement, and on work with Cowra Council via OECC's Sustainability Advantage program to develop renewable energy and emissions reduction plans for Council and the Cowra community. 100% Renewables has also engaged with a large number of State and local government stakeholders on opportunities, barriers and enablers to action on climate change by Councils and where relevant have drawn on this work as well.

1.1 Summary of key regional opportunities

Regional opportunities for CNSWJO member councils would build on successful regional initiatives that have been developed and are continuing to be delivered, including:

- Southern lights LED streetlighting to improve street lighting services, lower emissions and reduce cost for these services
- Regional destination EV charging infrastructure planning to help the region position itself for the electrification of transport
- Renewable energy contract for large sites and streetlighting, recently negotiated for regional councils of CNSWJO
- The development of REAPs, ERPs and similar plans for CNSWJO councils with program and resource support from NSW OECC

Based on all recent work with CNSWJO member councils, key regional opportunities that should be the focus of future **regional collaboration aimed at reducing GHG emissions** are:

1. Waste management that is focused on collaboration to develop opportunities to cost-effectively meet the emissions reduction goals set out in the NSW Waste and Sustainable Materials Strategy 2041 (WASM), including regional FOGO development or expansion, improving diversion rates and reducing overall waste generated in the region.
2. Energy security in the region can be enhanced by the development of a range of opportunities, including for example the development of regional mid-scale solar farms, expanding the uptake of solar PV across the region, and by the development of battery storage opportunities at both small and community-scale. These opportunities will be facilitated by the region's ability to continue to advocate for regulatory improvements that will facilitate greater deployment of these opportunities.
3. CNSWJO is seeing increased interest in the development of hydrogen energy in the region, and opportunities may arise in the context of waste management (e.g. Bathurst Regional Council planned trials at the WMC), wastewater treatment, and solar farms in the region. The scope for energy storage, fuel supply for heavy vehicles and other uses of hydrogen will emerge with an assessment of regional opportunities and the development of suitable trial projects.

4. Councils can build on the Regional EV Charging Infrastructure in Central NSW report (EV charging strategy), and follow Bathurst Regional Council's lead to develop operational fleet strategies that integrate hybrid and EV transition planning, and continue to work with NSW Government to develop fleet incentives that better meet the need of regional organisations. CNSWJO can play a role in supporting councils with the procurement and development of EV transition plans, and with the procurement of a regional strategy that builds on individual council plans.
5. Start to build capability and capacity to measure and implement supply or value chain improvements that lead to reduced emissions upstream and downstream of council operations. These are typically referred to as 'scope 3' greenhouse gas emissions, and represent inputs and outputs that councils can influence through their procurement policy and practices.
6. Councils in the CNSWJO region, in towns and through owned land, as well as agricultural businesses may be well situated to participate in and develop land-based carbon sequestration and improve the region's resilience and adaptation to increasing heat. An assessment of the region's capacity in this area of carbon removals and adaptation will help identify, advocate for and develop these opportunities.
7. Councils typically emit ~2-2.5% of the emissions of their regions, and so being in a position to work with and advocate for measures that will rapidly and significantly reduce community emissions is essential as a response to climate change. The CNSWJO region is generally well advanced and in a position to use its successes and leadership to help the region's communities reduce emissions. Regional collaboration and engagement with NSW Government opportunities should be developed to accelerate this work.
8. Good data underpins CNSWJO's and its member councils' ability to track their own emissions performance, measure and monitor community emissions, and develop business cases that support grant applications to further regional abatement opportunities. Developing regional emissions data reporting and management is an important element of CNSWJO's further work to develop these regional opportunities.
9. Capacity is often cited as one of, if not the most important factor influencing councils' ability to act on climate response, borne out in consultation with numerous regional NSW local government stakeholders. Addressing the barriers and implementing enablers that will help increase and improve resource capacity in the region to deliver key emissions reduction opportunities will influence how many regional initiatives can be progressed, and how quickly.

The following chapters provide a high level overview of each of these regional opportunities, and additional analysis of high priority opportunities would likely be required in order to further scope the opportunities, create briefs for future work (studies, grant applications, etc) and progress opportunities to implementation (pilot, rollout, etc).

2 Introduction

In 2018 the NSW Government established Joint Organisations (JOs) under the *Local Government Act 1993* across regional NSW. Arising from this change, JOs are now local government entities with legal powers to support councils to work together for better rural and regional outcomes. JOs have been established to enhance the way local and state governments work together to plan and deliver important regional infrastructure and investment. The functions performed by JOs include:

1. Strategic planning and priority setting;
2. Intergovernmental collaboration;
3. Shared leadership and advocacy; and
4. Other functions as the members see fit, which in the Central NSW region is to deliver services and provide assistance to, or on behalf of, councils (including capacity building), as directed by member councils.

To facilitate intergovernmental collaboration, all JOs have a specific relationship with their Regional Leadership Executive (RLE). Importantly for opportunities in this region, Central NSW JO now has broadly the same footprint as the Central West RLE.

The Department of Regional NSW, Regional Development division has long established cross-agency RLE groups that drive and support NSW Government priorities in each region of NSW. In addition, the purpose of the RLE is to respond to emerging opportunities and issues, lead cross-government or multi-agency actions, provide strategic advice, broker solutions and make decisions using a whole-of-region and whole-of-government lens. Although there are many commonalities, each region has its own unique challenges and opportunities led by subcommittees and working groups under each RLE.

Intergovernmental collaboration is a materially different role for JOs compared with their Regional Organisation of Councils (ROC) predecessors. It is still early days for this function of the JO and there are some enablers emerging in the strategic and funding framework.

2.1 Key potential JO collaborations with State and other agencies

The table below highlights some of the key State, Federal and other agencies where there are current and future potential collaborations that could help with progressing some of the regional opportunities highlighted in this report. Current opportunities are highlighted by way of examples of the types of initiatives that can be progressed.

Agency	Current opportunity
RLE	Resources support and regional strategy and coordination.
NSW Government Water	Regional Leakage Reduction Program under the Water Efficiency Program.
Office of Energy and Climate Change (OECC)	Sustainable Councils program – provides councils help with better understanding their energy use and develop business cases for energy efficiency and upgrades projects.
NSW Environmental Protection Authority (EPA)	Sustainability Partnership – program focused on phasing out single-use plastic in NSW. Grants available for local councils under the Boosting recycling and regional collaboration for waste management scheme.

Regional Growth NSW Development Corporation (RGDC)	Special Activation Precincts development (Parkes precinct).
Essential Energy	Develop opportunities for microgrids and other renewable energy sources in the region.
ARENA	Funding available for renewable energy projects: for example the Regional Australia Microgrid Pilots Program and Advancing Renewables Program.
RACE for 2030	Opportunity to partner with leading research organisations and industry to implement innovative solutions and technologies for residential homes.
TransGrid	EnergyConnect – energy infrastructure project driving implementation of renewable energy sources, such as wind and solar.
Australian Energy Regulator	Compliance and guidelines.

3 Waste management

Waste from landfill is a major contributor to the GHG emissions of regional NSW councils. Individually, councils, particularly smaller ones, may currently have limited ability to influence emissions from waste, and State-level and regional strategic responses are required to abate this emissions source. This could be facilitated through a strategic partnership with Netwaste.

3.1 Emissions from waste in Council operations carbon footprint

Table 1 highlights the estimated contribution of landfill waste to the carbon footprint of selected CNSWJO councils, based on recent footprint analysis.

TABLE 1: EMISSIONS FROM LANDFILL WASTE (% OF THE ENTIRE CARBON INVENTORY)

JO Council member	Landfill waste [%] of CFP	Notes
Bathurst Regional Council	64.6	Excludes value chain emissions
Cabonne Council	60.9	
Cowra Council	53.0	

The quality and reliability of data collected varies, and ranges from large landfills where emissions estimation aligns with National Greenhouse and Energy Reporting (NGER) requirements and includes detailed breakdown of waste, accounting for legacy emissions and for gas flaring; to estimates made using National Greenhouse Accounts (NGA) factors based on aggregated waste deposited for municipal, commercial and construction waste categories only.

3.2 Waste and Sustainable Materials 2041 – emissions targets

Having robust emissions estimation methods is important in the context of Councils efforts to meet the targets set out in the NSW Waste and Sustainable Materials Strategy 2041[1]. The strategy aims to achieve the following emissions-related targets for landfill waste by 2030:

- Implement measures to achieve 10% waste reduction per person by 2030
- Increase FOGO capture to achieve 50% organics reduction by 2030
- Implement further recovery to achieve 80% diversion from landfills by 2030

Given the significance of landfill emissions to Councils' carbon footprint, achieving these NSW targets would be necessary for CNSWJO Councils to make deep cuts to their emissions and to reach net zero emissions by 2050 in line with the NSW State Government and national targets.

3.3 Food Organics & Garden Organics (FOGO) – status, other opportunities

FOGO serves to reduce organic waste to landfill and results in lower emissions than would otherwise have been emitted. According to the NSW EPA 43 councils across NSW have FOGO services[2]. This includes four councils in the CNSWJO region, including Bathurst, Forbes, Parkes and Orange. For example, Bathurst Regional Council introduced a FOGO program in 2016. FOGO material is transported

[1] https://www.dpie.nsw.gov.au/__data/assets/pdf_file/0006/385683/NSW-Waste-and-Sustainable-Materials-Strategy-2041.pdf

[2] https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/business-government-recycling/food-organics-and-garden-organics

to a facility in Blayney where it is composted. An average of over 3,600 tonnes of FOGO has been collected each year since this service commenced. Recovery rates of both food and garden organics may be different for each council, and different between these resources, with garden organics tending to represent the majority of total organic material collected.

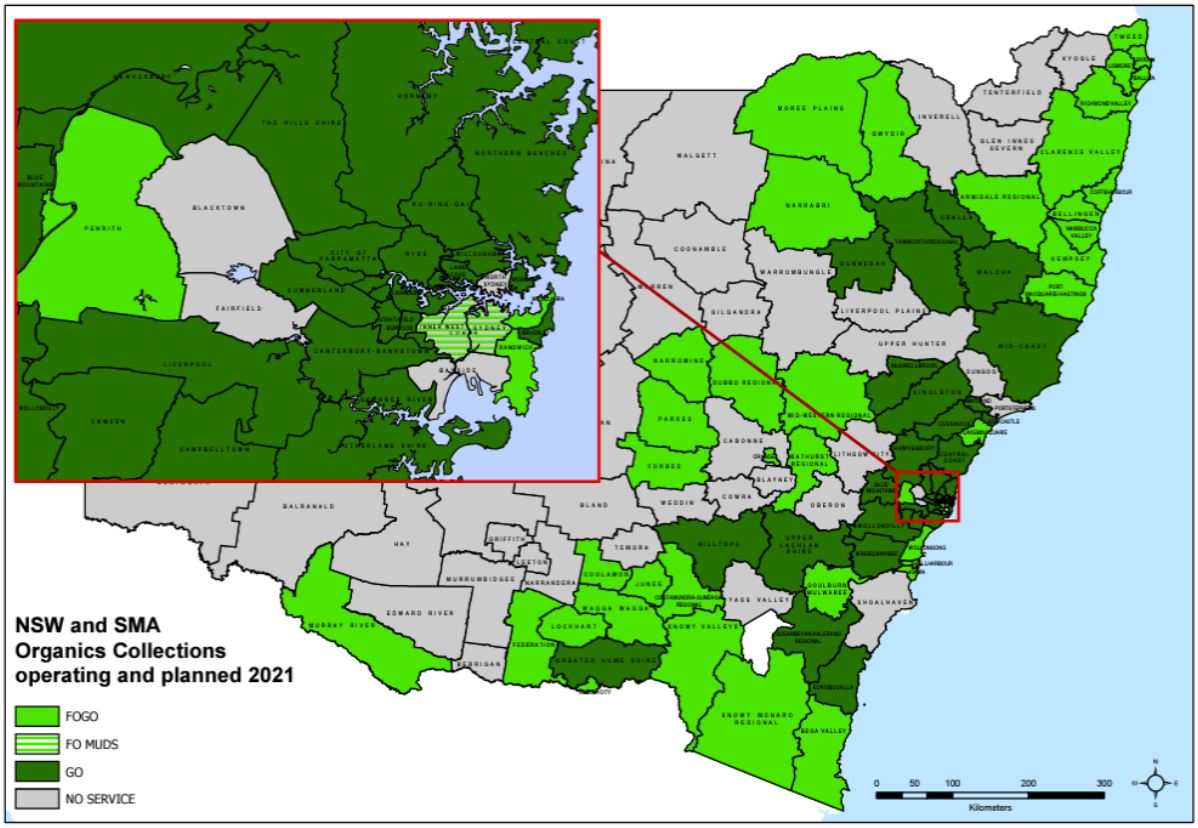


FIGURE 1: MAP OF NSW FOGO SERVICES BY COUNCIL, JULY 2022, EPA

Key opportunities that the region can explore and develop to reduce emissions from landfill associated with organics may include overall waste reduction, increasing the rates of material diverted to FOGO collection through ongoing education, infrastructure and other approaches, expansion of FOGO services to all councils, and increasing commercial FOGO recovery if/where applicable.

Further consolidation of landfill operations may also help to divert more materials to fewer landfill sites through implementation of more waste transfer stations. For example Cabonne Council currently operates four landfill sites as well as two waste transfer stations and one green waste facility. Additionally there may be opportunities to install or increase methane gas capture from landfill operations, as is currently occurring at Bathurst Regional Council's waste management facility (noting that as organics composting increases future gas volumes in landfill will decline).

CNSWJO's neighbouring region of Riverina Eastern Regional Organisation of Councils (REROC) has seven general purpose member Councils including Bland, Coolamon, Cootamundra-Gundagai, Greater Hume, Junee, Lockhart and Temora. Most have FOGO/GO services, and some of the key measures that have been developed to enable these include (from discussion with REROC):

- Greenwaste – designated area at landfills for organic waste from FOGO and implementation of solutions for faster composting

- Decentralised approach for FOGO – each council has its own facility for processing FOGO
- Reducing food contamination – running information campaigns for residents through TV advertising, cinemas advertising, Council websites, local papers and stickers (using the fact that the recycling is done by hand by real people).

3.4 Regional barriers and collaboration opportunities

There are numerous barriers to the development of initiatives that can address the complexities of waste in relation to emissions reduction goals, and this report does not seek to evaluate or detail these. Cost of changes including transport / added bin lifts, recurrent funding, pre-existing contracts, scale and resources are just some of the many dimensions of the challenge. In particular the cost of waste transport has been identified in past studies as a significant barrier to waste consolidation in the region.

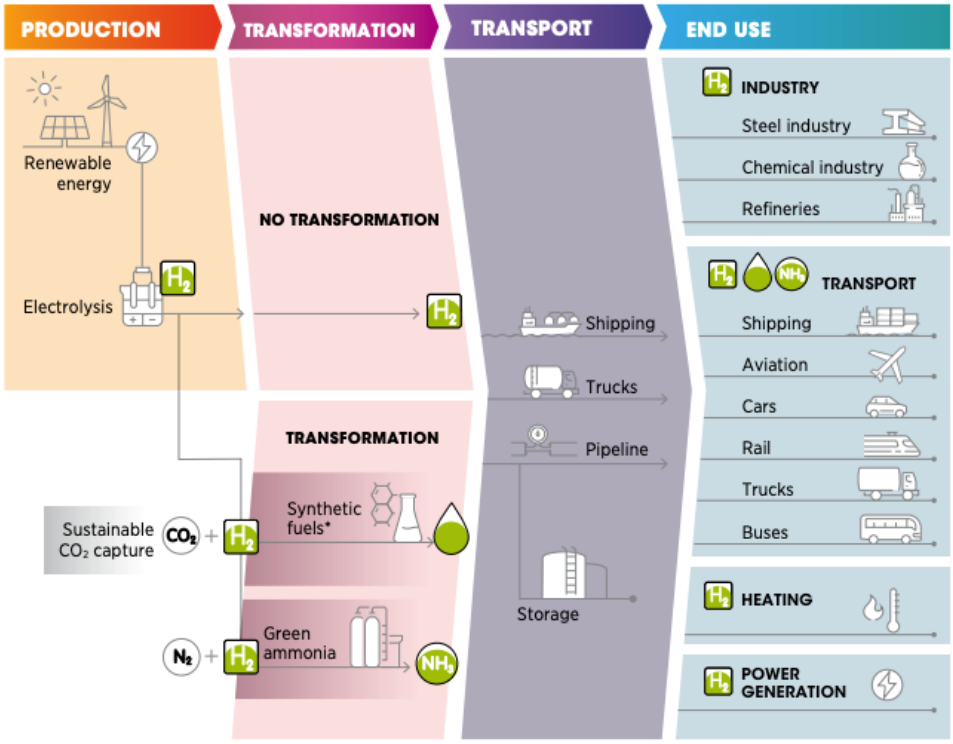
Regional collaboration with various state and federal agencies and organisations may help to overcome these challenges and remove some of the barriers. Potential collaborations may include:

- Working with NetWaste to determine the best solutions for achieving emission targets as set by the NSW Waste and Sustainable Materials Strategy 2041.
- Collaborating with the Environment Protection Authority (EPA) to seek support that will help the region to develop and deliver waste management solutions that are feasible and cost effective for residents of the region; in particular with solutions to the waste transport challenge.
- Working with NSW Government Office of Energy and Climate Change and the EPA in the evolving circular economy space.
- Collaborating with research organisations, for example Smart Centre UNSW, to produce building materials from recycled materials like glass, rubber or textiles which could be diverted from landfill.
- Collaboration with the Regional Growth and Development Corporation on reducing emissions
- Cooperating with community and industry initiatives maximising opportunities and minimising duplication
- Leading ongoing collaboration among key peak regional stakeholder in waste with a view to maximising opportunities and minimising duplication
- With the proponents (Brightmark), State Government and Parkes Shire Council regarding the planned $260 million, 200,000 tonnes per year Global Recycling Business at the Parkes Special Activation Precinct (SAP)

4 Green hydrogen energy

Hydrogen has attracted much interest recently, and the Federal and NSW State governments are pursuing and supporting a range of initiatives aimed at developing this technology. Some projects are focused on the development of large-scale projects that will inject H2 into the gas grid and the development of ammonia from clean energy inputs.

At a Federal level there is a $1.2 billion commitment to develop a hydrogen industry through the Clean Hydrogen Industrial Hubs Program, with priority regions including Gladstone, Hunter Valley, Latrobe Valley, Eyre Peninsula, Darwin, Bell Bay and the Pilbara. In NSW the development of H2 hubs in the Hunter and Illawarra regions are key priorities under the NSW Hydrogen Strategy, and the development of the Wagga Wagga Special Activation Precinct (SAP) may include hydrogen technology as well. Potential pathways for green hydrogen are numerous, as identified by IRENA, see below.



Source: IRENA

** The term synthetic fuels refers here to a range of hydrogen-based fuels produced through chemical processes with a carbon source (CO and CO_2 captured from emission streams, biogenic sources or directly from the air). They include methanol, jet fuels, methane and other hydrocarbons. The main advantage of these fuels is that they can be used to replace their fossil fuel-based counterparts and in many cases be used as direct replacements – that is, as drop-in fuels. Synthetic fuels produce carbon emissions when combusted, but if their production process consumes the same amount of CO_2, in principle it allows them to have net-zero carbon emissions.*

FIGURE 2: POSSIBLE PATHWAYS FOR GREEN HYDROGEN (IRENA)[3]

There is interest in Central West NSW in the emerging hydrogen economy, and CNSWJO can look to work with its regional Council members, NSW Government and other parties to identify, evaluate and progress trials and projects in this new area. Some of the main areas for focus in this regard may be:

- Processes to identify and be able to respond to regional grant opportunities for hydrogen,

[3] IRENA (2020), Green Hydrogen: A guide to policy making, International Renewable Energy Agency, Abu Dhabi

- Regional hydrogen capacity and pathways assessment, including land and planning aspects and constraints,
- Bathurst Regional Council has signed an MOU with Scimtek to trial conversion of landfill gas to hydrogen that could be used in future to power its trucks. Learnings from these trials could be captured and potentially used to help with similar regional projects,
- Integration of hydrogen production with renewable energy generation projects in the region, for example in conjunction with mid-scale solar or bioenergy generation projects,
- Hydrogen production from treated wastewater with renewable electricity to create fuel and oxygen to offset diesel and aeration energy requirements and/or to create other saleable co-products,
- The Parkes SAP is being developed with the potential to develop hydrogen capacity as well, with this potentially being injected into the gas network and used for refuelling on the freight route

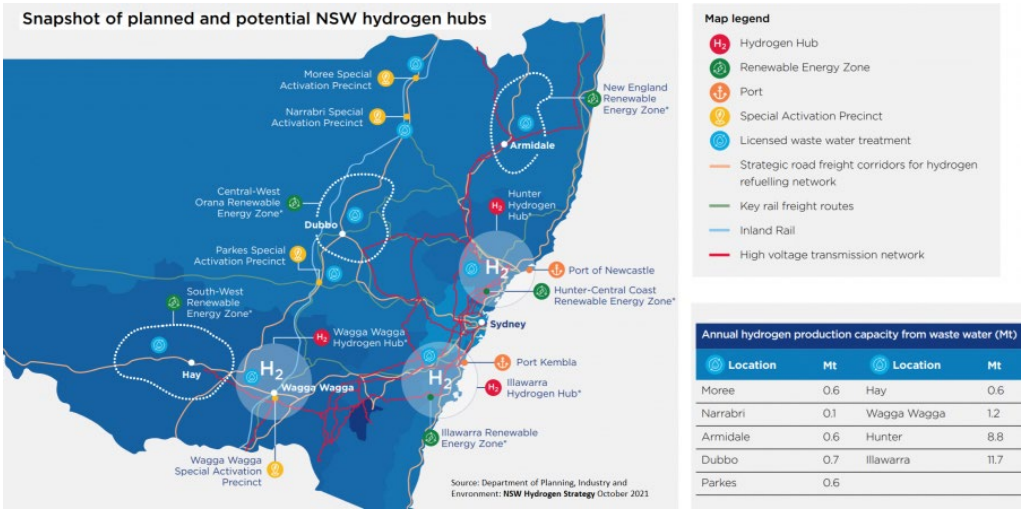


FIGURE 3: PLANNED AND POTENTIAL HYDROGEN HUBS IN NSW[4]

4.1 Opportunities for regional collaboration

The above are just some possible applications and initiatives that could be pursued, and the trial to convert landfill gas to hydrogen by Bathurst Regional Council and the integration of hydrogen generation into the Parkes SAP represent the extent of known current plans. At this stage some of the initiatives that CNSWJO could pursue include:

- Maintain a watch on the progress of the two planned projects for potential application or opportunities for other councils, and for grant or other opportunities that can help these projects to develop,
- Seek support from NSW and/or Federal Governments to develop an assessment of the regional capacity and strengths, and to prioritise where regional efforts can best be placed to further position it for this emerging industry.

[4] NSW DPIE NSW Hydrogen Strategy, October 2021

5 Regional renewables and energy security

The NSW Electricity Infrastructure Roadmap, legislated in late November 2020, represents a significant change in the future development of the electricity system for NSW. One of the key pillars of the Roadmap is the development of Renewable Energy Zones (REZ) – the creation of specific regions within the broader electricity network where there will be a focus on expediting investment in renewable energy generation like solar farms, wind and storage as well as the transmission and distribution network required to transport the electricity generated.

The CNSWJO region sits outside the Central West-Orana REZ, but there is a strong desire to increase renewable energy capacity in the region, and to improve energy security through the development of solutions such as small-scale solar farms, battery energy storage systems, and other energy generation solutions like bioenergy, pumped hydro and the like. Many areas within the CNSW region have poor energy security, including the local government areas of Weddin, Cabonne, Orange and Lachlan. The development of these new solutions would build on a strong record of renewables uptake in the region, underpinned by local council Renewable Energy Action Plans (REAPs), implementation of solar PV by councils and the Central NSW community, and the recent entry by CNSWJO (and REROC) councils into a renewable energy supply agreement.

5.1 'Renewables-ready grid'

The Australian Energy Market Operator (AEMO) has signalled that it aims for the Australian main grid to be able to handle periods of 100 percent renewable energy by 2025, and this has already been achieved at sub-regional level including on several occasions in South Australia. This energy transition needs to be driven by a combination of technical innovation, economics, government policies and consumer choices. While large-scale generation, storage and transmission / distribution measures will underpin this change, there is a role for Distributed Energy Resources (DER) in achieving this outcome.

5.2 Battery energy storage

Battery energy storage is a key technology in the delivery of a more secure grid in Central West NSW, and CNSWJO can have a role in the assessment and design of energy storage solutions beyond planned grid-scale projects proposed for Yetholme, Mt Panorama and Parkes.

These can include bulk-buy battery storage initiatives, community batteries (potentially aligned with the new Federal Government's direction), microgrids, vehicle-to-grid initiatives, Virtual Power Plants, batteries integrated with regional mid-scale renewables, for example.

As the cost of batteries declines the feasibility of these solutions will improve, and having regional 'shovel-ready' projects will enhance CNSWJO and Councils' capacity to be successful in receiving support for key priorities.

5.3 Regional mid-scale solar farms & other renewable energy generation

Cabonne Council has a plan to build a 2.14 MW mid-scale renewable energy plant, on its own land, with two 2.75MWh battery storage systems. The aim is to incorporate electricity generated from this plant in to a renewable energy supply agreement which will benefit the region.

The development of more small to mid-scale solar farms can have multiple benefits, including opportunities for community ownership or other involvement, reduced emissions, improved energy

security, access to multiple income streams particularly where integrated with battery storage, greater community renewable energy literacy and engagement, and long term cost savings for local councils.

In addition to mid-scale solar, the region also has a large bioenergy resource, and opportunities such as a solar + bioenergy microgrid are being pursued by others and should be considered in Central NSW.

5.4 Expanding regional solar PV uptake

Apart from solar farms in the region, uptake of solar by homes and businesses sits in the range 20-30% for six of 10 CNSWJO councils, and in the 30-40% range for the other four (source: https://pv-map.apvi.org.au/). While this is reasonable, this level of uptake lags that seen in other areas such as the Orana region where uptake is well in excess of 40%. In addition, APVI mapping of rooftop capacity shows that there remains significant additional solar PV potential that can be developed, which can be realised as small systems are replaced or expanded, and when batteries are cheaper and provide consumers with greater opportunity for self-consumption.

5.5 Opportunities for regional collaboration

CNSWJO's role can enable it to engage with Councils, NSW Government (such as OECC, Energy Co), ARENA, CEFC, Essential Energy, Federal government and other key stakeholders to scope and develop regional renewable energy opportunities that both reduce emissions and improve energy security.

- It is important for CNSWJO, member councils and engaged partners (for example through initiatives like the Regional NSW Business Case and Strategy Development Fund, as well as future grant opportunities), to engage with Essential Energy and the NSW Government and have a role in the co-design of suitable distributed renewable energy projects in the region, to synchronise with other planned developments.
- Within REAPs and/or building on these, having a number of 'shovel-ready' battery energy storage projects within CNSWJO councils ready to go for grant applications, bulk buys or similar has previously been flagged as a key opportunity to pursue, perhaps where aligned with State or Federal grant assistance to make these cost-effective in the short to medium term.
- Mapping of solar and bioenergy resources can help to highlight where further opportunities could be developed, and local councils led by CNSWJO can have a key role in developing this in consultation with land-based businesses, communities and other businesses. This type of mapping project and identification of suitable locations for renewable energy project development has been done by other Joint Organisations.
- Regional education / workshops / information provision, together with measures such as bulk procurement (as has been successfully implemented in New England) and microgrids can be a way of expanding solar PV uptake in the region. This would require a broad community engagement, education and stocktake of opportunities in the region. As urban centres like Bathurst and Orange begin to incorporate more mid-rise and commercial strata developments, demand for the development of strata and precinct renewable energy systems will increase and known barriers associated with these opportunities will need to be addressed and overcome. Increasing the uptake of solar by renters and low income and social housing may also be opportunities that CNSWJO and its member councils would want to progress.

6 Operational fleet hybrid & EV strategies

Transitioning to electric vehicles is an important step in reaching net zero by 2050, with increasing supply of electricity from renewables key to ensuring this transition is zero emissions over time. The NSW government introduced its Electric Vehicle Strategy in 2021 with $595 million made available to support a range of initiatives such as EV rebates, stamp duty concessions, charging infrastructure (ultra-fast chargers on EV Super-Highways, EV Commuter Corridors and EV off-street parking chargers), commuter and tourist EV charging plans, and support to fleets to source EVs. As well as support for passenger vehicles and charging, the EV strategy will support commercial EV and electric bus rollouts.

6.1 Status of fleet planning – regional and council levels

Three of the main barriers to adoption of EVs are higher upfront cost compared to diesel and petrol vehicles, range anxiety and limited model availability. However these barriers are reducing and it would be prudent for the region, its member councils and the community to plan for and be in a position to switch to electric (or hydrogen / Fuel Cell EV) vehicles at the optimum time.

Bathurst Regional Council has developed an Electric Vehicle Transition Plan (EVTP), which recommends medium term targets including:

- 20% reduction in Council fleet fuel consumption by 2025
- 35% reduction in Council fleet fuel consumption by 2030

Bathurst Regional Council's EVTP describes a medium-term electric vehicle transition path, and highlights relevant information relating to NSW Government support for electric vehicles, EV charging infrastructure, projected growth in electric vehicles, availability of electric passenger vehicles and commercial electric vehicles in Australia. Bathurst's landfill gas-to-hydrogen trial is another element of its fleet fuel switching program.

In addition CNSWJO received funding to develop a regional destination charging strategy and this is a first step in developing the region's response that will meet the needs of visitors to the region.

6.2 Opportunities for regional collaboration

Several opportunities could be pursued further by member councils and CNSWJO, with support from the NSW and Federal Government where possible.

- All councils should be encouraged to develop their EV fleet transition strategy so that they have a roadmap for how and when they will be able to buy / lease low emissions and EV vehicles over the short to medium term. Incorporation of assessments of charging infrastructure needs for council facilities could form part of these assessments.
- Beyond passenger vehicles councils use a wide range of other vehicles (buses, utes, waste and other trucks, vans) and plant (graders, mowers, small plant, etc), for many of which there are commercially available electric options and others emerging. Extension of planning to include these fleet items, including charging infrastructure needs and depot electrical and solar expansion opportunities may also be warranted at some scale.
- Apply for grant funding to support the rollout of destination charging in Central NSW.
- Continue to engage with governments to advocate for design of incentives / grants that fit with regional area needs and are based on regional consultation where applicable.

7 Value chain emissions reduction

Value chain emissions (VCE) are referred to as 'scope 3' emissions, and they relate to the activities upstream and downstream of an organisation that occur as a result of the activities of the organisation. Through assessment of emissions in the value chain of several councils it is common for this to represent a third or more of total emissions.

7.1 What are value chain emissions and who is acting on these?

Upstream activities that give rise to GHG emissions are illustrated below. As well as purchasing goods, services and capital items, emissions from employees commuting to work are included, as well as assets / facilities that the organisation leases but doesn't own. In most carbon accounting the main upstream emissions source that organisations report on are those in the tranport and distribution of energy. For most local councils the bulk of scope 3 value chain emissions are upstream of the organisation's activities. Where waste is managed by a third party this will also sit in the upstream emissions category.

Downstream emissions primarily relate to the transport and use of products and services of the organisation, and in most councils this represents a small source of scope 3 emissions. Emissions associated with assets that are leased by others tends to be the main source. Investments held by organisations may well be a large source of emissions depending on where funds are held, however it is uncommon for this source to be included in an organisation's scope 3 footprint at this time, though this may change as greater focus is placed on value chain emissions.

FIGURE 4: SCOPE 1, 2 AND 3 EMISSIONS

The GHG Protocol [5] and Australian Government Climate Active standard [6] provide best-practice guidance on how to measure, reduce, offset, validate and report emissions that occur as a result of the operation of an organisation.

At this time we understand that around 15 Australian councils are Climate Active carbon neutral, and others measure their emissions in line with these standards, and across all organisations there has been significant growth in the number that are certified carbon neutral and increasing pressure on

[5] https://ghgprotocol.org/

[6] The Climate Active program is delivered by the Australian Government Department of Industry, Science, Energy and Resources (DISER)

organisations to start to use their influence to drive low emissions outcomes in their value chains. On the whole though, the total number of organisations that are acting to measure and reduce their value chain emissions remains low.

NSW Government (OECC) is currently (2022) running a pilot project with eight organisations to measure their full carbon footprint, identify carbon 'hotspots' that can potentially be influenced, and engaging with suppliers to plan for changes. This VCE pilot project may lead to a greater focus on these emissions by NSW Government going forward.

7.2 What is the scale of 'scope 3' value chain emissions across CNSWJO?

In work with CNSWJO councils to date, scope 3 emissions have only been assessed to any depth with Cowra Council; for all other councils only energy-related scope 3 emissions have been assessed.

TABLE 2: SCOPE 3 EMISSION SOURCES

LGA	Scope 3 emissions [%]	Emission sources
Cowra Council	36.8	Upstream emissions from energy (transmission, distribution, etc). Printing, stationery, office equipment, postage, food, IT & telecommunications, clothing, cleaning services & supplies, chemicals, advertising, business services, capital works.
Bathurst Regional Council	N/A	Scope 3 not considered in REAP or ERP
Cabonne Council		
Oberon Council		
Weddin Shire Council		

For Cowra Council scope 3 emissions were estimated to represent 36.8% of their total carbon footprint, dominated by capital works. An assessment of other councils' full carbon footprint may be required in order to gauge whether this is a typical result for a regional council that operates waste and wastewater assets; based on work with other organisations it is likely that this is the case, but further data is required to confirm.

7.3 Opportunities for regional collaboration

With an increasing focus on scope 3 value chain emissions but with a limited data set currently available and likely low levels of knowledge of the potential scale, relevance and capacity for councils to influence scope 3 emissions, the next steps for CNSWJO should be:

- Assessment of scope 3 emissions for more councils so its size and make-up are better known,
- Assess literacy, knowledge of scope 3 emissions and perceived capacity to influence through council processes such as procurement
- Determine whether there are any 'quick win' opportunities that could be pursued in collaboration with councils and relevant State agencies, for example use of waste materials like glass in road materials,
- Collate results from these initial steps to determine a course of action going forward for CNSWJO

8 Land-based carbon sequestration and adaptation

8.1 Local government areas sequestration and insetting opportunities

Land-based measures play an important role in climate response, with available measures including:

- Development of land-based solutions to create carbon offsets that can be certified under recognised schemes such as the Federal Government's Emissions Reduction Fund (ERF) and the Climate Active carbon neutral standard. Offset units that can be created under the ERF for example are called Australian Carbon Credit Units (ACCUs). Solutions for revegetation and agriculture could include, for example:
    - Reforestation by environmental or mallee planting which involves establishing and maintaining native vegetation on land that has been clear for at least 5 years
    - Retention of native vegetation (avoided clearing and deforestation) action which involves retaining areas of native forest that would otherwise be cleared
    - Human-induced regeneration (biomass)
    - Mixed species environmental planting
    - Managing livestock methane (animal diet and herd management)
    - Manure management (composting, methane flaring)
    - Converting biomass to biochar and apply to soil to lock carbon up in the soil
    - Managing fertilisers and crop residues (nitrous oxide specifically becauses it causes 20% of NSW agriculture emissions)
    - Irrigation practices
- Increasing tree canopy in cities and towns and increasing overall vegetation to mitigate urban heat.
- Insetting, where an organisation will implement nature-based solutions such as reforestation, agroforestry, renewable energy and regenerative agriculture within its value chain.
    - To inset, a council would need to evaluate its full carbon footprint, assess land assets it owns or has stewardship over that could be re-vegetated or otherwise store carbon under an eligible method, and develop insetting projects aligned with the guidelines.
- Biodiversity offsets, where development impacts are offset with the creation of biodiversity in other locations.

8.2 Opportunities for regional collaboration

Some available measures could benefit councils and others would benefit regional businesses like agriculture. Potential priority areas and opportunities could include:

- Working with NSW Government's Primary Industries Productivity and Abatement (PIPAP) initiative to help regional farmers and land managers engage with opportunities to reduce their emissions, improve their carbon management, and enhance biodiversity on their land alongside production.
- Assess land ownership and management by local councils to establish whether there is a case for the development of insetting projects that can lower councils' carbon footprints.
- Work with councils and developers to enhance biodiversity offsetting and help to address urban heat island impacts for new developments.

In pursuing land-based carbon storage opportunities it is important to recognise that these are not substitute measures for decarbonisation, but are complementary to science-aligned approaches.

9 Community emissions reduction

9.1 Emissions in the community v council operations

As a general rule-of-thumb, Council emissions may account for on average 2-2.5% of a community's emissions, but this can be much higher where a council manages landfill waste and provides water and wastewater services. The vast majority of emissions happen as a result of the activities of the rest of the community, and a key reason for councils to act to reduce their emissions is to demonstrate to their communities what can be done and inspire or motivate them to reduce their carbon footprint.

In Cowra for example an assessment of emissions by Council and the community shows the following:

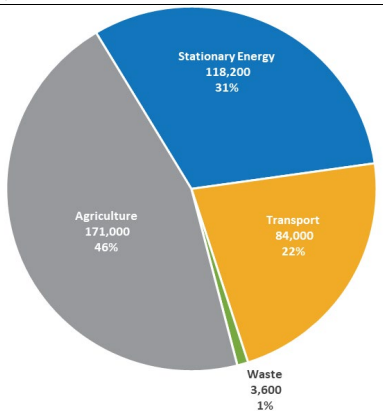
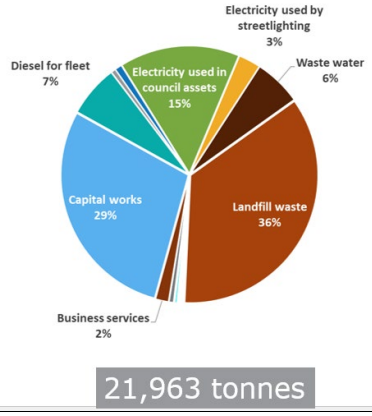
377,000 t CO2-e – Cowra Community	21,963 t CO2-e – Cowra Council
	

FIGURE 5: COWRA COMMUNITY AND COUNCIL CARBON FOOTPRINTS

9.2 Opportunities to develop community emissions reduction initiatives

A number of opportunities could be developed to increase community responses to reduce emissions:

- Increasing solar uptake, battery storage, microgrids and mid-scale renewable energy generation, EV charging and land-based carbon storage and management have been identified and outlined above, and these are some of the core solutions that will help to reduce emissions across the CNSWJO region.
- Engagement with communities – residential and business can help to gauge regional attitudes, ideas, barriers and enablers to effective action to reduce emissions.
- Public data is available that provides top-down modelling of the region's emissions (e.g. BZE snapshots of LGA emissions at https://snapshotclimate.com.au/). Data sets are also available publicly from electricity and gas networks, and through Councils that can supply LGA-level actual electricity, gas, waste and wastewater emissions. The accuracy of transport emissions estimation modelling at a regional level is evolving, and regional mapping can estimate changes in land carbon stock over time. So there are opportunities for the region and for local councils to track LGA-level emissions, and to track bottom-up indicators such as solar PV uptake, battery installations and EV registrations and charging points. This will enable key gaps to be identified that further support and collaborations could address.

Climate adaptation and resilience are also areas where Councils have a significant role to play, and community consultation and access to current/recent and accurate data are key inputs to developing regional plans that are effective and capable of responding to a changing climate.

10 Develop Council emissions data systems

Having reliable data and understanding the carbon footprint of councils' operations is necessary for developing emission reduction pathways and tracking progress towards targets.

10.1 Current council emissions data collection systems maturity & gaps

At present most Councils have a baseline that was developed for scope 1 and scope 2 emissions as part of a REAP or ERP; for REAPs this is largely energy-focused whereas for ERPs this is extended to include wastewater and landfill. At CNSWJO level electricity data is collated centrally for the councils and this has been used to provide data for the development of these plans, supplemented with data from councils. Scope 3 emissions have only been assessed in the context of upstream energy-related emissions for most councils, and in the value chain for just a single council, Cowra.

Other than for the development of REAPs or ERPs most councils do not routinely track or report on their energy demand or emissions. CNSWJO tracks electricity consumption for all councils, and some councils do track their energy use and emissions, such as Bathurst and Orange, for example. For many councils emissions are updated periodically or in the context of an updated Plan.

10.2 Key data priorities

An assessment of current status and needs has been carried out by CNSWJO and key priorities identified to include:

- Conduct an analysis of baseline emissions which could then be overlayed by Council with REAPs and other documents already developed. This will bring all councils up to the same 2021/22 year's emissions for scope 1 and 2, and will establish a short-term trend of where they are now compared with emissions as reported in their REAP/ERP.
- Develop and deliver educational materials to Councils to help them understand their emissions data – i.e. what it all means, where the data comes from, and future needs that should encourage or motivate them to sustain an interest in tracking emissions data across the operational and value chain.
- Develop a consistent tool (spreadsheet) for councils to update their emissions annually so that they can be tracked over time, likely to cover scope 1 and scope 2 emissions and potentially the most relevant scope 3 emissions like asphalt and concrete.

Over time the importance of value chain scope 3 emissions is likely to grow and this should be a focus area for all organisations. However at this time the main objective for CNSWJO is to have all member councils on a path towards better understanding and engaging with emissions sources that are directly relevant to their operations.

11 Capacity of regional Councils to reduce emissions

The development of REAPs and ERPs for several Councils, together with discussions with CNSWJO have helped to highlight a number of regional opportunities that could be pursued to reduce Council and regional emissions and create new projects and work for the region.

Integral to the region's capability to evaluate and take advantage of these opportunities is the resource capacity that is available. While CNSWJO and its member councils, particularly larger ones, have greater capacity and leadership in place to progress opportunities than many other regions, there are nonetheless significant constraints to rapid progression of the opportunities.

Discussions with a number of local councils in metro and regional areas, as well as groupings of councils (Joint Organisations, peer networks, representative bodies) in the context of other work (external to this project) has helped to highlight some of the key barriers and enablers.

The capacity of regions to effectively respond to the challenges of climate change – mitigation, adaptation, resilience – is a continuing need, and these identified barriers and enablers may help to inform continuing discussions between CNSWJO and its member councils as well as State Government.

11.1 Barriers

- With energy and carbon solutions and goals continually shifting, and rapidly so, the need for expert, relevant and regular information on the changing landscape is increasing, and many councils struggle to keep fully abreast,
- Many grant opportunities are lost or not fully taken advantage of due to a lack of resources to find, apply or implement these,
- Many grant opportunities are not JO-specific or don't incentivise collaboration, which means if JOs were to apply they would be competing with their members which for the CNSWJO is against policy. More JO-specific grant opportunities are needed for JOs to better support their members regionally,
- Councils may not be able to pay the same as the private sector and good staff can be lost along with their built-up knowledge of council operations and opportunities,
- There is insufficient focus on co-designing initiatives with and for regional areas, and programs and support that is designed remotely without regional input have less success and cost more,
- Rate capping means many Councils budgets for sustainability initiatives have been cut,
- The resource needs of JOs are greater than are in place (nil in many cases), and to be more effective both member council and State government input and leadership is needed. Medium to long term certainty of funding cannot be provided where funding is heavily grant dependent, which slows or prevents strategic regional opportunities from being developed,
- Within councils the level of leadership and commitment to emissions reduction varies, and this is usually reflected in the level of support given to progress and implement key opportunities. In many councils' literacy levels on carbon / climate change remain low,
- Where there is no dedicated sustainability role it can be difficult to progress initiatives. Implementation of sustainability initiatives tends to be ad hoc or reliant on a key staff member's motivations, whereas with a dedicated role sustainability, plans and a pipeline of projects will be in place and can be progressed continuously.

11.2 Enablers

- Many councils find value in peer networks and access to useful tools and case studies, though this is linked to internal capacity and interest in participating in online webinars and chat / discussion forums,
- There are 'internal' networks where collaboration happens across councils and sector, such as waste, wastewater/water treatment, and these networks could be used to help drive opportunities,
- Greater coordination of and between programs, grants and State Government departments with roles in helping regions respond to climate change,
- Discussions have highlighted some possible solutions, including having climate response (and potentially a Sustainable Development Goals (SDG) -aligned response) integrated within Integrated Planning and Reporting (IP&R) frameworks, having or encouraging a climate-focused role in all councils with GM-level reporting, and significantly improving data collection systems that can enable regional-level analysis to help develop abatement opportunities.

Some capacity constraints have been aided through support from OECC's Sustainable Councils program, and continuing discussions with OECC are recommended to ensure that successes arising from this support are recognised and can be used to build the case for continued support of the JO in its regional net zero emissions journey.

12 Concluding comments

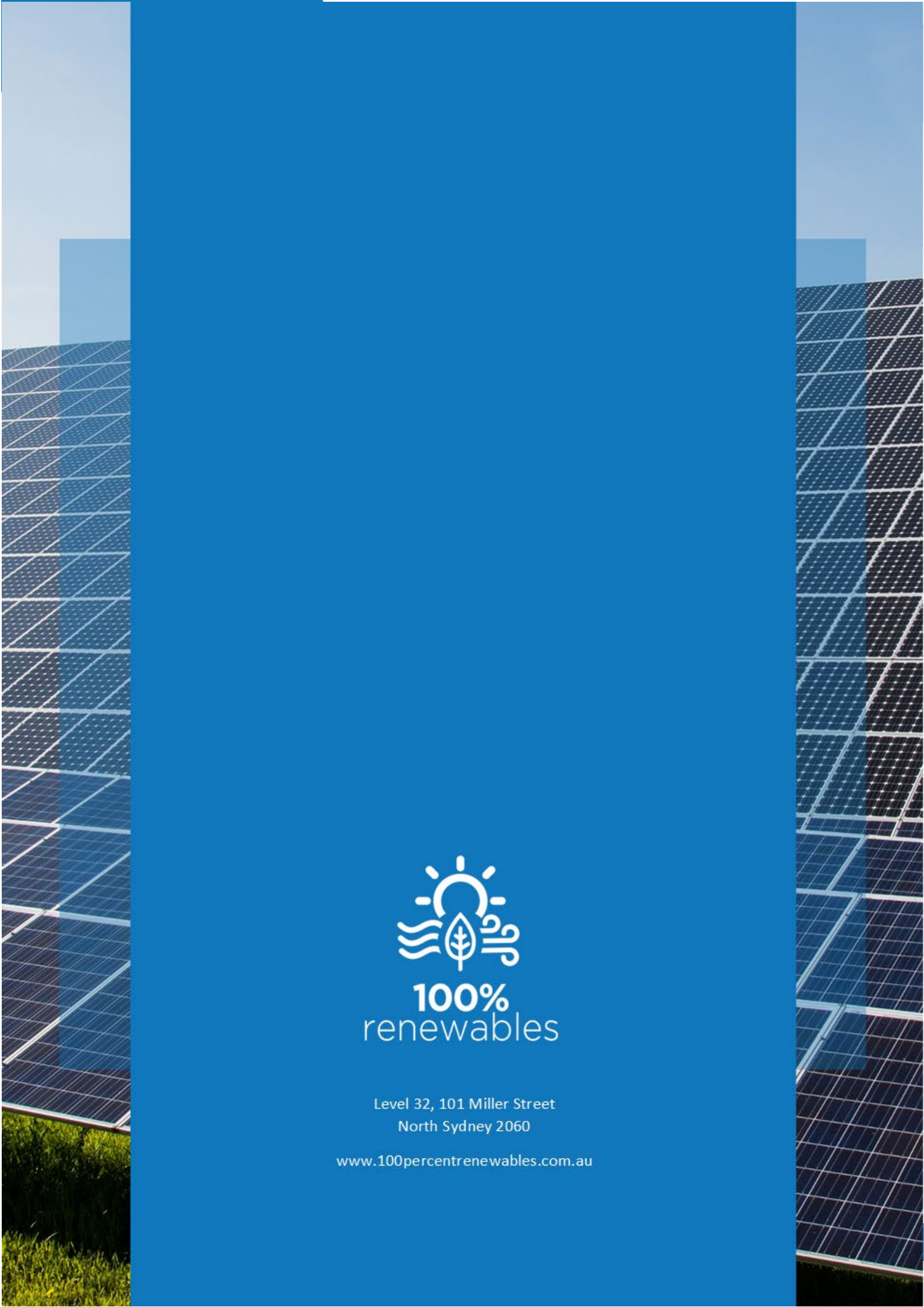
Central NSW Joint Organisation has demonstrated leadership and its commitment to work collaboratively with its member councils to accelerate the transition towards net zero carbon emissions for the Central NSW region. Notable achievements in recent years have included LED streetlight upgrades, a regional EV charging strategy, the development of Renewable Energy Action Plans (REAPs) and Emissions Reduction Plans (ERPs) for member councils, and most recently facilitating a regional procurement process for a long term agreement for the supply of renewable electricity to power member councils' operations.

While much has been achieved, there remains much more to do to reduce the councils' and the region's emissions, and the development of REAPs and ERPs for councils has served to highlight potential new opportunities that CNSWJO can pursue, in collaboration with councils, State & Federal Government agencies and other parties. These opportunities have been highlighted in this report.

Regional opportunities can build on existing measures and further reduce council emissions – such as from landfill gas emissions, fleet, value chain, sequestration and battery storage; and increase regional energy security, resilience and emissions reduction – through regional solar farms, microgrids and battery storage, community emissions reduction strategies, hydrogen generation and EV transition.

Underpinning CNSWJO's and member councils ability to progress strategic regional net zero priorities are increased resource capacity, good data, increased climate change literacy and collaborations with other organisations that can deliver financial and resources support and deliver outcomes for the Central NSW region.

This summary of the key regional emissions reduction opportunities is a starting point, and can help with prioritisation, further work to expand and refine what the specific needs and opportunities for the region are, and help to underpin funding bids and resourcing solutions that can progress these initiatives.



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