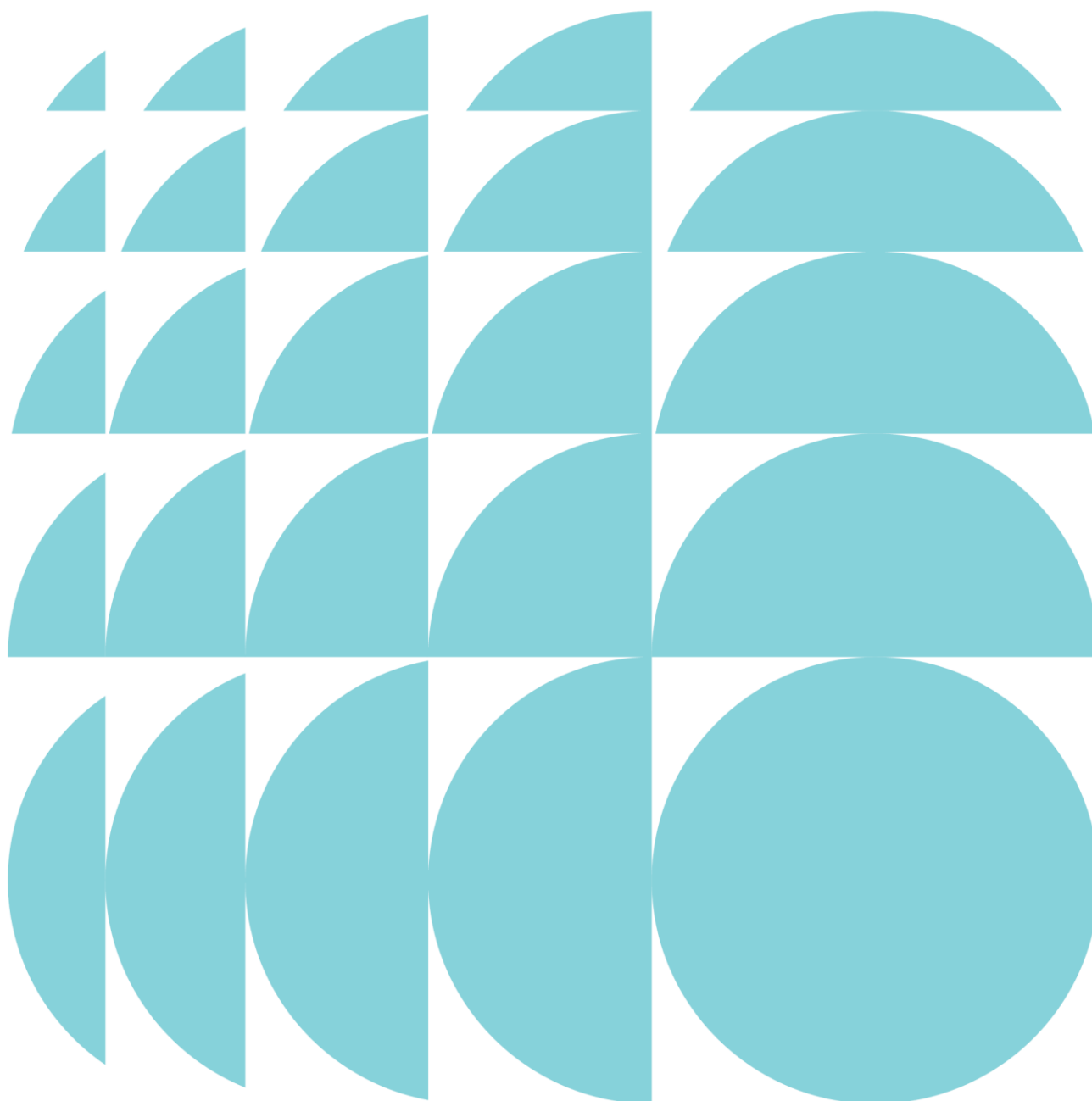




Authorship

Report stage	Authors	Date	Review	Date
Draft report	Alex Wilson	15 October 2021	John Noronha	15 October 2021
Final report	Alex Wilson	18 March 2022	John Noronha	18 March 2022

Disclaimer

Every effort has been made to ensure the accuracy of the material and the integrity of the analysis presented in this report. However, Ethos Urban Pty Ltd accepts no liability for any actions taken on the basis of report contents.

Contact details

For further details please contact Ethos Urban Pty Ltd at one of our offices:

Ethos Urban Pty Ltd		ABN 13 615 087 931
Level 8, 30 Collins Street Melbourne VIC 3000	173 Sussex Street Sydney NSW 2000	Level 4, 215 Adelaide Street Brisbane QLD 4000
(03) 9419 7226	(02) 9956 6962	(07) 3852 1822

economics@ethosurban.com

www.ethosurban.com

Our Reference: 3210289

Contents

Executive Summary	i
Introduction	1
1 Project Context	5
1.1 Site Location	5
1.2 Project Description	5
1.3 Policy Context	6
1.4 Study Area	9
1.5 Summary	11
2 Baseline Regional Economic Profile	12
2.1 Population	12
2.2 Labour Force	12
2.3 Occupational Structure	13
2.4 Business Structure	14
2.5 Township Services Capacity	16
2.6 Summary	22
3 Economic Impact Assessment	24
3.1 Project Investment	24
3.2 Project Employment	24
3.3 Cumulative Effects Assessment	26
3.4 Labour Force and Business Participation Assessment	28
3.5 Housing and Commercial Accommodation Sector Impacts	29
3.6 Local Wage Spending Stimulus	30
3.7 Agricultural Impacts	31
3.8 Ongoing Economic Stimulus	31
3.9 National Grid Supply Benefits	32
3.10 Tourism Opportunities	32
3.11 Proposed Mitigation Measures	32
3.12 EIA Conclusions	34

Executive Summary

RES Australia Pty Ltd (the Proponent) has commissioned Ethos Urban to prepare an Economic Impact Assessment (EIA) for the proposed 500 MW Tallawang Solar Farm development (the Project), at 1318 Castlereagh Highway, approximately 8 km northwest of Gulgong in the Mid-West Regional Local Government Area (LGA). The Project is located in the Central West Orana Renewable Energy Zone (CWO REZ).

The Project will be located across a 1,370 ha site (Project Area) comprising eight landowners and, subject to planning approval, grid connection and financing, the facility is expected to be operational by July 2026.

The main findings of this EIA are summarised as follows.

Regional Economic Context

- 1 The population of the Study Area (comprising the LGAs of Dubbo Regional Council, Mid-Western Regional Council and Warrumbungle Shire) totalled 88,620 persons as of June 2020. Over the period 2020-2036, annual population growth in the Study Area is expected to be +0.3% per annum (p.a.) compared to the Regional New South Wales growth rate of +0.5% p.a. The Warrumbungle Shire LGA is projected to experience population decline over the coming years. In this regard, local investment projects (such as the proposed Project) can generate new employment opportunities for residents and diverse income streams for local farmers. These factors may contribute to retaining, and potentially expanding, population levels within this area.
- 2 The Study Area had an unemployment rate of 4.0% in June 2021, compared to the NSW rate of 6.0%; with approximately 1,800 jobseekers unemployed at that time. Construction of the Project will provide new short-term employment opportunities for the Study Area's labour force participants (including unemployed jobseekers subject to suitable skills match), with a small amount of ongoing employment also supported once the facility is operational.
- 3 The Study Area's occupational and business structures indicate a good base exists to service the needs of the Project, with approximately 12,050 workers and 1,860 businesses in the Study Area involved in construction-related activities.
- 4 The major regional cities/townships of Dubbo and Mudgee have the capacity and labour force to service many aspects of the Project, with smaller settlements such as Gulgong, Dunedoo, Wellington, and Coolah, also likely to provide labour, accommodation and other general services to the Project.

Economic Impact Assessment

- 5 The Project will require approximately \$1.2 billion in investment during the construction phase (of which approximately \$180 million will be retained in the Study Area) and will support 270 direct and 430 indirect Full Time Equivalent (FTE) positions over the 34-month construction period (i.e., 700 FTE jobs in total). Once operational, 7 direct and 20 indirect FTE jobs will be supported by the Project.

Of this total, the Study Area is expected to benefit from 275 FTE construction jobs and 11 FTE ongoing jobs (includes direct and indirect jobs) associated with the Project.

- 6 The Project will provide significant participation opportunities for businesses and workers located in the Study Area, having regard for the good match of skills and resources available. A proactive procurement approach by the Proponent will assist in delivering this outcome.
- 7 The 'external' Project labour requirement would be expected to generate an accommodation requirement for 175 workers at the peak of the construction phase. This represents 9% of total commercial accommodation rooms/cabins within a 70-minute drive of the Project Area. However, significant further capacity is available in caravan parks (powered sites) and private rentals (e.g., Airbnb, real estate listings); while the large number of unoccupied dwellings may provide additional supply to market to support the Project. The Project will generate new revenues for accommodation providers over the construction phase (especially in off-peak seasons), including in small townships such as Gulgong, Dunedoo, and Coolah, as well as for private renters.
- 8 Construction workers relocating to the region would be expected to inject approximately \$13.5 million in new spending into the economy over the construction phase, supporting approximately 90 FTE jobs in the service sector in the Study Area over this time.
- 9 Cumulative impacts are associated with significant development of major renewable energy projects in the CWO REZ in the coming years (including the adjoining Barneys Reef Wind Farm also to be developed by the Proponent) and ongoing demand from the tourism sector. Potential impacts include insufficient accommodation and workers to service the Project and concurrent demands. In this regard an Accommodation, Procurement and Employment Strategy (APAES) is recommended (detailed below).
- 10 Approximately 1,370 ha of existing agricultural land will be required to host the Project, with a development footprint of 864 ha. This land is mainly used for grazing supported by some cropping. No loss of employment associated with the Project Area is anticipated, either directly (on-site) or through the supply chain, as agricultural activities can continue on the balance of the four landholdings. Additionally, the Proponent is exploring the possibility of sheep grazing on the Project Area, which would ensure some agricultural activity is retained on the host land.
- 11 Ongoing economic stimulus associated with the operation of the Project is estimated at approximately \$196.2 million over 35 years, (2021 dollars, CPI adjusted) relating to landowner returns, operational wage stimulus, community/neighbour payments and net land tax revenue to Council.
- 12 The Project has the capacity to supply sufficient clean energy to power the equivalent of approximately 330,000 homes pa, which represents approximately ten times the total annual residential requirements of the Study Area (34,300 homes). This level of new renewable energy generation supports State Government net emissions reductions targets.
- 13 Operation of the Project could potentially support small-scale tourism and educational opportunities in the future, especially in light of the significant development of the renewable energy sector in the CWO REZ over the coming years.

Net Community Benefit Assessment

A summary of community outcomes is included in Table A.

Table A: Tallawang Solar Farm – Net Economic Benefit Assessment

Factor	Value
Negative Community Outcomes	
Temporary loss of agricultural land (35 years)	864 ha
Loss of employment (includes direct and indirect jobs)	0 jobs
Positive Community Outcomes	
Construction Phase	
Capital investment	+\$1.184 billion
Study Area investment (including wage stimulus)	+\$177.5 million (assumes 15% of total investment)
Construction employment (direct plus indirect jobs)	700 FTE total jobs (over 34 months), including: <i>Study Area jobs</i> 190 FTE direct on-site 85 FTE indirect off-site Total: 275 FTE
Operational Phase	
Operational employment (direct and indirect jobs)	27 FTE total jobs (for 35 years), including: <i>Study Area jobs</i> 7 FTE direct on-site 4 FTE indirect off-site Total: 11 FTE
Economic Stimulus	
Total net local economic stimulus (landowner returns, wage stimulus, community/neighbour payments, increased Council land tax returns).	+\$196.2 million (over 35 years)
Total Economic Benefits (Construction and Operational Phases)	+\$373.7 million (Construction period PLUS 35 years operation)

- 14 In order to manage potential cumulative impacts and maximise benefits to the Study Area's economy and communities, the following mitigation measures are recommended:

Accommodation, Procurement and Employment Strategy (APAES)

Prior to commencing construction, it is recommended the Proponent prepare an APAES for the Project in consultation with key stakeholders (Council, accommodation providers, real estate agents, tourism agencies, industry groups, employment agents etc). This APAES might include the following:

- measures to ensure there is sufficient accommodation for the workforce associated with the construction phase of the Project
- measures to address any specific cumulative impacts arising associated with other State Significant Development projects in the area
- measures, such as a Local Procurement Plan, to prioritise the employment of local workers and businesses for the construction and operation of the Project
- a program to monitor and review the effectiveness of the strategy over the life of the Project, including regular monitoring and review during the construction phase.

Community Benefit Programs (CBP).

The CBP will:

- Include a provision of annual payments to non-host properties neighbouring the solar farm benefitting landowners with land adjacent to the project boundary, whom are not directly associated with the project infrastructure.
- In addition, a Community Benefit Fund will be available to the wider community. This provision is an annual offering of money to local community organisations and programs. Guidelines and management structures for the operation of the Community Fund will be put in place.

Introduction

Background

RES Australia Pty Ltd (RES) is seeking to develop the proposed Tallawang Solar Farm (the Project) in the Central West region of New South Wales (NSW), approximately 8 kilometres (km) northwest of Gulgong within the Mid-Western Local Government Area (LGA).

The Project lies within the Central West Orana Renewable Energy Zone (CWO-REZ), established under the NSW Government's Electricity Strategy.

The Project will involve the construction, operation and decommissioning of a 500 megawatt (MW) solar farm with a Battery Energy Storage System (BESS) of approximately 200 MW/400 MW-hours, a 330 kilovolt (kV) overhead transmission line of approximately 13 km long and associated infrastructure which will connect the Project to the national electricity grid. One onsite switchyard and a 330 kV substation is proposed, at two possible locations within the solar farm and BESS development area. The final location of the onsite switchyard and substation will be determined during detailed design.

The Project will have one primary access off the Castlereagh Highway. Two possible locations for the primary access are being investigated, with the final location of the access to be determined in consultation with the road authority and Mid-Western Regional Council.

The Project will connect to the grid via the proposed CWO-REZ Transmission Project (including new 500 kV and 330 kV transmission lines, substations and related infrastructure) currently being developed by the NSW Government to support the growth of the CWO-REZ. The CWO-REZ Transmission Project is subject to a separate development application process.

The final arrangement and design of the CWO-REZ Transmission Project has not yet been confirmed, however based on consultation between the proponent and NSW Government, it is anticipated that the grid connection point for the Project will be via a proposed switching station near to the proposed Barneys Reef Wind Farm project area, directly north of the Tallawang Solar Farm. The proposed Barneys Reef Wind Farm is also being developed by RES and subject to a separate development application process. The proposed switching station will support independent connections from both the Tallawang Solar Farm and Barneys Reef Wind Farm projects.

The final alignment of the Project's overhead transmission line is subject to the final placement of the switching station and the grid connection point, however a 60 m wide corridor of approximately 13 km long has been identified by RES to support access to the anticipated connection point. The final placement of the transmission line for the Project will be determined in coordination with the Barneys Reef Wind Farm project.

For the purposes of this assessment, the Project Area is defined as the area inclusive of:

- the solar farm and BESS development area
- a transmission line corridor of approximately 13 km long and 60 m wide for an overhead transmission line connecting the Project to the proposed new to build grid infrastructure.

The Project encompasses eight freehold properties and some parcels of Crown Land ('paper roads'), covering an area of approximately 1,370 ha. These properties are primarily utilised for cropping and grazing activities. The development footprint for the Project is approximately 864 ha.

The Project is expected to generate up to 270 direct Full Time Equivalent (FTE) jobs over the 34-month construction period and 7 direct FTE jobs during operation.

The Project is a State Significant Development (SSD) under the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP) as the capital value of the Project is over \$30 million. A development application (DA) for the Project is required to be submitted under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

RES Australia (Pty) Ltd (the Proponent) has commissioned Ethos Urban to prepare an Economic Impact Assessment (EIA) for the Project.

This EIA report supports the Project's Environmental Impact Statement (EIS) and responds to the Secretary's Environmental Assessment Requirements (SEARs) for social and economic impacts, which are:

"The EIS must include an assessment of the social and economic impacts in accordance with Social Impact Assessment Guideline (DPIE, July 2021) (subject to transitional arrangements) and benefits of the project for the region and the State as a whole, including consideration of any increase in demand for community infrastructure services, assessment of impact on agricultural resources and agricultural production on the site and region"

This EIA specially addresses economic impacts and benefits for the region and State as a whole, including assessment of impact on agricultural resources and agricultural production on the site and region. SEARS relating to social factors are addressed in a separate Social Impact Assessment which has been prepared for the Project by Umwelt.

Methodology

The following methodology has been applied to this EIA:

- Identification of a relevant Study Area for the assessment which reflects likely labour force, accommodation, and supply chain linkages available to support the Project. The Study Area is defined in terms of host and surrounding LGA boundaries.
- Review of federal and state policies relevant to investment in the renewable energy sector, including the Paris Climate Accord, NSW Large Scale Solar Energy Guidelines and the Central Orana Renewable Energy Zone (CWO REZ).
- Baseline analysis of population, labour markets, occupational structure and business structure for the Study Area and NSW, with reference to latest available data relating to ABS Estimated Resident Population, Department of Environment and Planning State and Local Government Population Projections, ABS Census, ABS Business Counts and Department of Education, Skills and Employment Small Area Labour Markets.
- Assessment of the capacity and opportunities of townships in the Study Area to participate and service the Project. This information has been compiled through a desktop review of townships and accommodation data (accommodation provider websites, Airbnb and Vrbo databases, website searches and discussions with the Proponent)
- Assessment of Project investment, with investment figures provided by the Proponent and share of investment retained in the Study Area informed by benchmarking analysis of similar sized completed renewable energy facilities located in regional areas.

- Assessment of Project employment (direct and indirect) for construction and operational phases. Direct employment is assessed as jobs created to support the on-site construction and operation of the Project. Indirect employment is assessed as jobs supported through the industrial and consumption/induced impacts of each Project stage. Relevant ABS multipliers are applied to construction and operational phases. Employment numbers have been provided by the Proponent based on estimated Project labour requirements. Ratios of direct Study Area (local) and non-Study Area (imported) employment and share of indirect employment supported in the Study Area are based on benchmarking analysis of similar sized completed renewable energy facilities located in regional areas.
- Identification of business and industry participation opportunities, with reference to baseline analysis outcomes regarding workforce size and skills composition and procurement activities proposed by the Proponent.
- Assessment of agricultural impacts which includes employment and production impacts through land consumption and disruption to activities, and benefits to host landowners from new incomes and improved on-site infrastructure.
- Assessment of accommodation and housing impacts with reference to the baseline analysis and the estimated number of construction workers that may require accommodation at the Project's peak.
- Assessment of cumulative impacts relating to the potential concurrent construction of major infrastructure projects in the Study Area/within 100km of the Project Area. Importantly the introduction of the CWO REZ is likely to generate significant demand for new projects over the coming years. This includes assessing potential impacts on accommodation and labour and providing measures to manage identified cumulative impacts.
- Estimates of economic stimulus impacts (construction and operation phases) including Project wages and spending, landowner rental incomes, neighbour benefit payments, uplift in Council rates revenues, and Proponent's Community Fund payments. Construction stimulus is expressed in 2021 dollars (and calculated over 34 months), while operational stimulus is calculated over 35 years using 2021 dollars but indexed to 2.5% CPI annually.
- Description of proposed mitigation measures relating to accommodation, workforce and procurement and community benefit sharing.

Note, detailed assumptions and calculations are provided throughout the report.

The following specific data sources have been used in compiling this EIA:

- ABS Average Weekly Earnings, May 2021
- ABS, Counts of Australian Businesses, including Entries and Exits, June 2016 to June 2020
- ABS Census of Population and Housing, 2016
- ABS Estimated Resident Population, 2020
- ABS Household Expenditure Survey, 2015-16
- ABS Regional Internal Migration Estimates (Provisional), March 2021
- ABS Regional Population Growth, Australia
- Australian Government Austrade, Tourism Research Australia Australian Accommodation Monitor 2018/19 and 2020/21
- Australian National Accounts: Input-Output Tables, 1998-99
- Airbnb and Vrbo databases, October 2021
- Department of Employment - Small Area Labour Markets, June Quarter 2021
- Department of Environment and Planning NSW, State and Local Government Population Projections 2019
- Mudgee Region Annual Report 2018
- Tourism Research Australia 2017
- Umwelt Tallawang Solar Farm Scoping Report, July 2021
- www.energy.nsw.gov.au/renewables/renewable-energy-zones
- www.app.remplan.com.au/midwestern/economy/summary
- www.barneysreef-renewableenergy.com
- www.auhotels.com
- www.cleanenergycouncil.org.au/advocacy-initiatives/community-engagement/best-practice-charter
- www.tallawang-renewableenergy.com
- www.tripadvisor.com

1 Project Context

1.1 Site Location

The proposed Tallawang Solar Farm (the Project) will be developed on a 1,370 ha site in the central western region of NSW, which is well-connected to a number of major regional centres and towns located within approximately a 60-70 minute drive from the Project Area. These settlements are listed below (in order of population size):

- **Dubbo**, significant regional city located approximately a 70-minute drive to the north west of the Project Area.
- **Mudgee**, major regional city located approximately a 35-minute drive to the south of the Project Area.
- **Wellington**, small-medium township located approximately a 60-minute drive to the south west of the Project Area.
- **Gulgong**, small township located approximately a 10-minute drive to the south east of the Project Area.
- **Coolah**, small township located approximately a 40-minute drive from the Project Area to the north east.
- **Dunedoo**, small township located approximately a 25-minute drive to the north of the Project Area.
- **Mendooran**, small township located approximately a 50-minute drive from the Project Area to the north west.

These regional centres and townships, to differing extents, are likely to play important roles in supporting the requirements of the Project.

The Project Area, which comprises four separate landholdings, is currently used for farming purposes (cattle and sheep grazing, with some cropping) under the Rural Use 1 Zone (Primary Production) and Residential 5 Zone (Large Lot Residential).

The Project will require planning approval by the NSW State Government as a State Significant Development (SSD).

1.2 Project Description

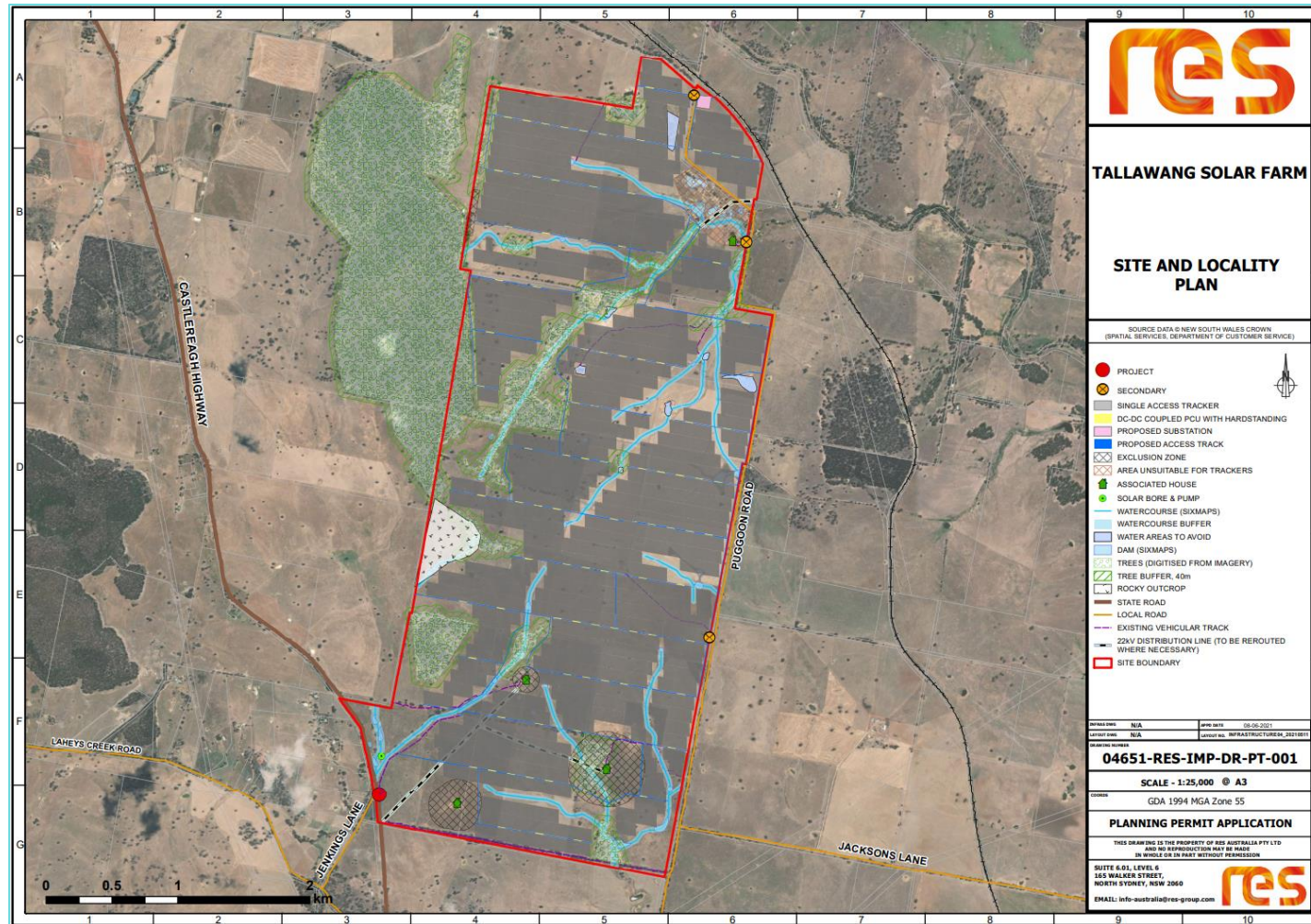
The Project is expected to include the following key components:

- Approximately 1,238,500 panels photovoltaics panels.
- Battery storage to store energy produced on site, the proposed battery storage is anticipated to have a rated capacity of approximately 1,000 MWh. The facility would comprise lithium-ion batteries housed across the site in up to 18 customised containers.
- 11km of hybrid power lines both underground and overground electrical conduits and cabling to connect the arrays to the inverters and transformers.
- Systems of inverter units and voltage step-up throughout the arrays.

- Site office and maintenance building, vehicle parking areas, internal access tracks, and perimeter security fencing.
- The Project will connect to a newly constructed 330 kilovolt (kV) transmission line proposed as part of the Central West Orana REZ (CWO REZ), via an approximately 11 km long 330 kV overhead powerline (proposed as part of this Project) across several freehold properties. The overhead powerline will connect to the 330kV CWO REZ transmission line via a newly constructed substation on the proposed Barneys Reef Wind Farm (proposed as part of the Barneys Reef Wind Farm project). The alignment of this overhead line will cross the adjacent railway line north of the Project.

The preliminary site layout is shown in Figure 1.1.

Figure 1.1: Tallawang Solar Farm – Preliminary Site Layout



1.3 Policy Context

International agreements and government policy settings are important factors in influencing demand and investment in the renewable energy sector, as noted below.

Paris Climate Accord

The Paris Accord is a comprehensive international climate agreement to which Australia is a party. The Accord provides a framework for participating nations to set themselves nationally determined contributions (NDCs) beginning in 2020, with review at five-year intervals. The agreement sets out a global consensus to limit temperature increases to below two degrees Celsius when compared to pre-industrial levels; an additional goal is to maintain this increase at less than one and a half degrees Celsius. NDCs do not have any set lower limit but are required to progress over time (beginning with the intended NDC pledged during the Paris conference), and to be 'ambitious'.

Australia's current targets are to achieve a reduction of emissions by 5% from 2000 levels by 2020, and by 26-28% below 2005 levels by 2030.

NSW Large Scale Solar Energy Guidelines 2018

The NSW Large Scale Solar Energy Guidelines issued by the NSW Government notes the following (p.12):

"Social and economic impacts: Impacts, both positive and negative (including how they are distributed), of the proposed development on potentially affected people and groups. This includes workforce accommodation, job creation opportunities, and flow-on economic impacts to local communities."

This EIA report addresses these impacts.

Central-West Orana Renewable Energy Zone

In late 2019, the NSW Government announced plans to create its first Renewable Energy Zone -- (REZ), seeking to attract 3,000 MW of investment in the state's Central-West (which will cover the area in which the Project is to be located) in order to accelerate the state's efforts to attract cheap wind and solar to replace NSW's ageing coal-fired power stations.

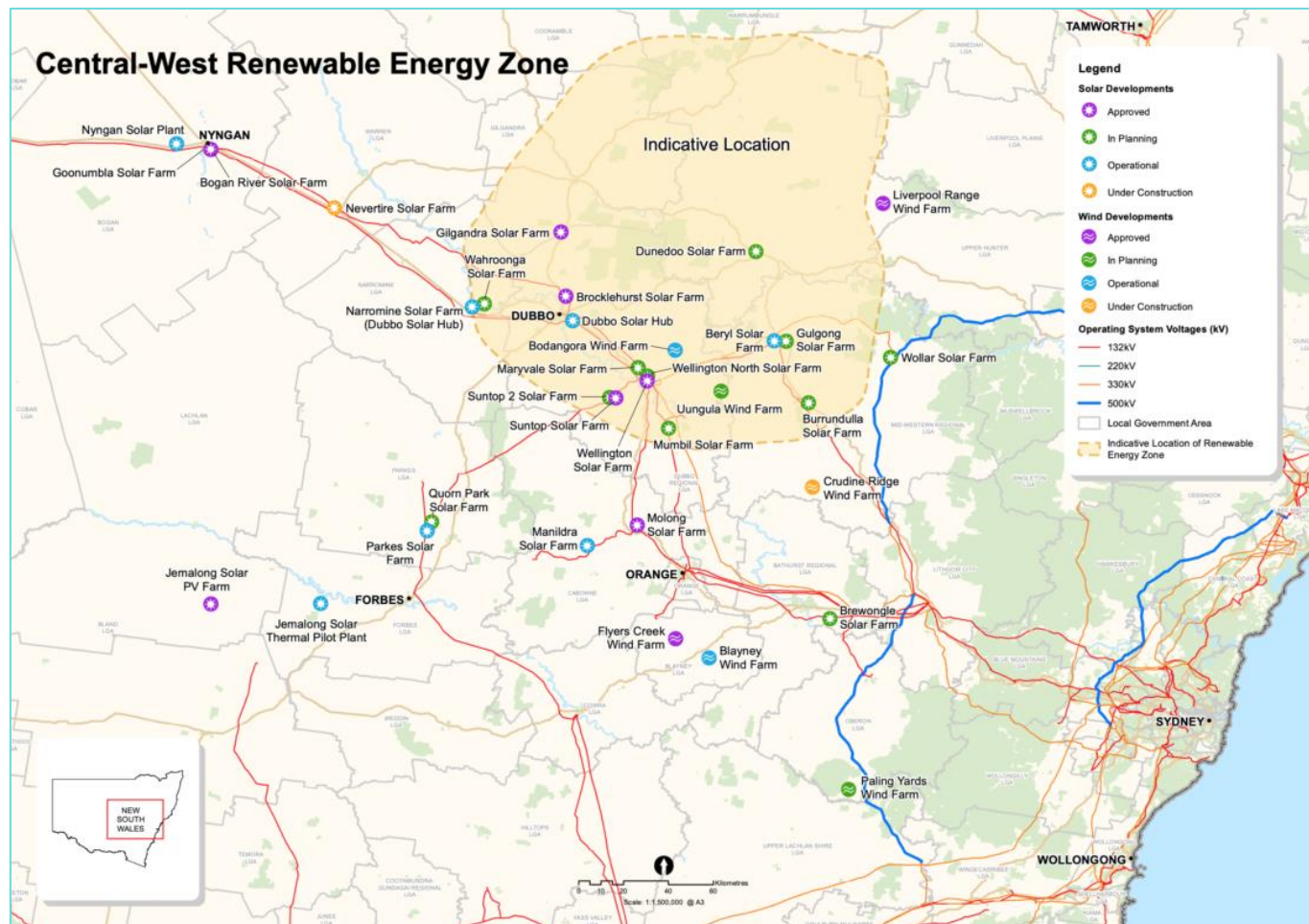
The state's Central-West has been chosen as a pilot location due to a host of approved and planned projects, relatively low build costs and a strong mix of solar and wind resources. It is part of the NSW government's long-term plan to deliver three REZs across the state – in the Central-West, New England and South-West regions; building on the NSW Transmission Infrastructure Strategy and in line with the Australian Energy Market Operator's Integrated System Plan.

This pilot Renewable Energy Zone would produce enough energy to power up to 1.3 million homes each year. The NSW Government will set up a dedicated Renewable Energy Zone body that will bring together investors and undertake early planning so benefits for local communities are maximised. Where appropriate, the NSW Government will change the regulatory settings to incentivise generators to cover part of the cost of building new transmission for REZs.

ARENA has announced \$5 million in funding for TransGrid, in conjunction with the NSW Government, to undertake preliminary works for a Central-West Orana Renewable Energy Zone. Proposed for an area surrounding Dubbo (refer to Figure 1.1), the \$16.2 million project will scope the feasibility of a plan to construct a high voltage transmission network that will unlock 3,000 MW of new

electricity generation capacity. The new study will explore all aspects of developing a renewable energy zone and deliver a business case for the proposed Central-West Orana zone, which if approved could see construction begin in late 2022.

Figure 1.2: Proposed Location of the Central-West Renewable Energy Zone

Source: www.energy.nsw.gov.au/renewables/renewable-energy-zones

1.4 Study Area

The Study Area for the Project has been defined in terms of the following Local Government Areas (LGAs):

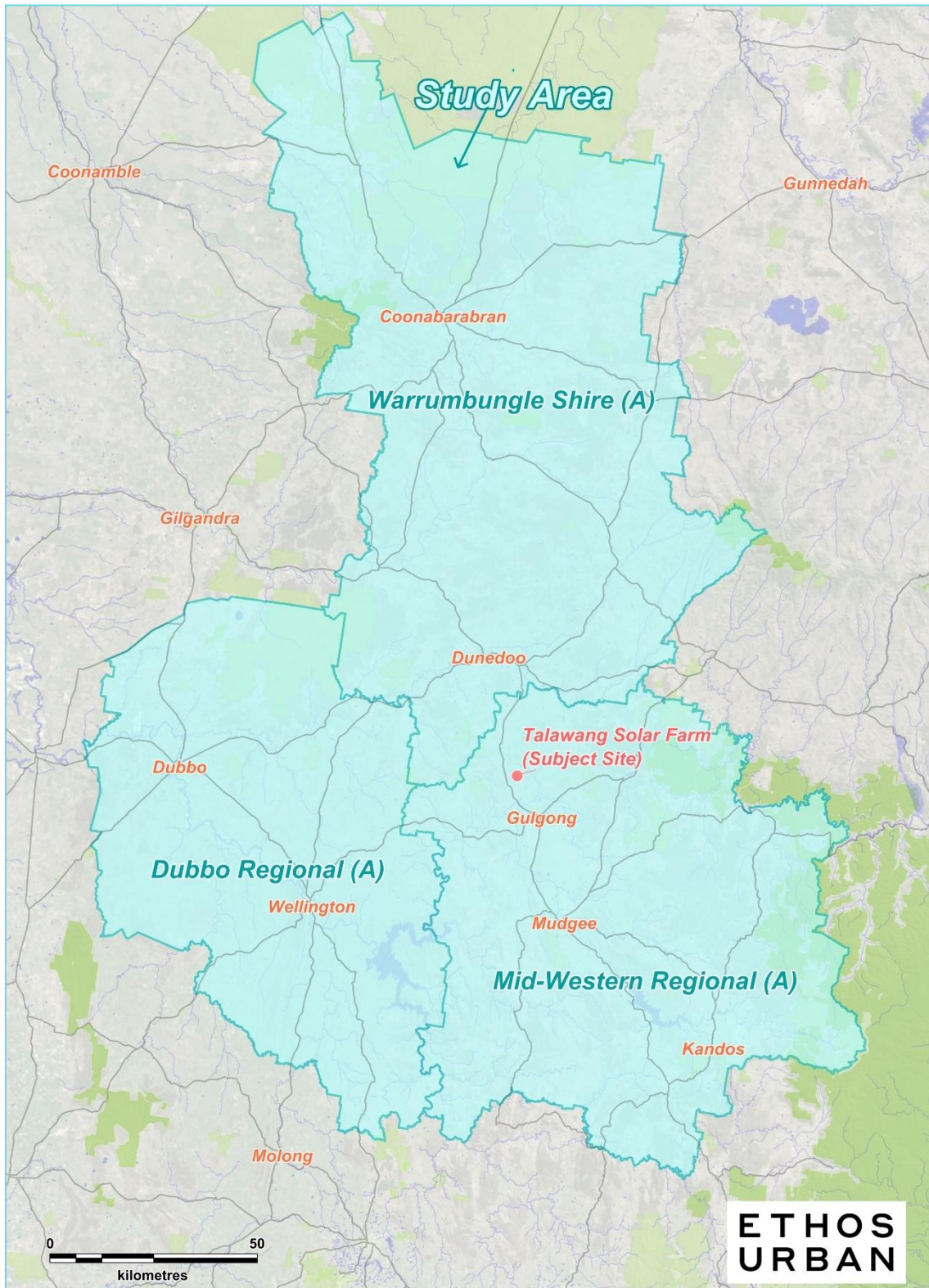
- Mid-Western Regional Council (in which the project is to be located)
- Dubbo Regional Council
- Warrumbungle Shire

The main regional cities/townships/settlements in the Study Area are all located within a 70-minute drive of the Project Area.

The Study Area's local and regional communities, to differing extents, have the potential to contribute to the Project and derive economic benefits from both the construction and ongoing phases of the Project.

The Study Area is illustrated in Figure 1.3.

Figure 1.3: Tallawang Solar Farm – Study Area



Source: Ethos Urban using Mapinfo, StreetPro, BingMaps

1.5 Summary

- 1 The Proponent is proposing the construction of the 500 MW Tallawang Solar Farm. The Project will be located approximately 8km north west of Gulgong and is bounded to the west by the Castlereagh Highway, and by agricultural land on the other sides of the Project Area.
- 2 The Project lies within the Mid-West Regional Local Government Area (LGA) in central western NSW and is well connected to the major regional centres of Dubbo and Mudgee.
- 3 The Project will be located across eight properties totalling approximately 1,370 ha of agricultural land, which is currently used mainly for cattle and sheep grazing.
- 4 Subject to planning approval, grid connection approval and financing; it is anticipated construction of the Project could start in June 2023, and the facility may be operational by April 2026 with an anticipated 34 month construction phase.
- 5 Federal (Paris Climate Accord) and State (NSW Large Scale Solar Energy Guidelines) policies provide guidance for the renewable energy sector in the short-to medium-term. Additionally, the NSW Government is in the process of setting up a Renewable Energy Zone in the State's Central-West, which covers the area in which the Project is to be located. This initiative is aimed at providing more certainty for the sector, especially with regard to the transmission network, and in doing so stimulate major investment in the sector.
- 6 This EIA will provide an understanding of potential economic benefits arising for the local and regional economies and communities through the construction and operational stages of the Project, as well as any other impacts associated with the Project.

2 Baseline Regional Economic Profile

2.1 Population

The population of the Study Area totalled 88,620 persons as of June 2020 (ABS Estimated Resident Population, 2020), including 54,044 persons located in the Dubbo Regional Council LGA.

Over the period 2020-2036, annual population growth in the Study Area is expected to be +0.3% pa (or +239 persons pa over 16 years) compared to the Regional New South Wales growth rate of +0.5% p.a. While this level of growth is comparatively weak, it is noted that Dubbo Regional Council is projected to experience an average population growth rate (+0.4%) similar to Regional NSW to 2036. However, the Warrumbungle LGA is projected to experience a decline in population over the period. This highlights the need for local investment projects which provide new employment opportunities for residents and alternative income streams for local farmers. Both these factors can contribute to retaining, and potentially expanding, population within this LGA.

The proposed Project will provide new income to the host landowners (farm operators), while the construction and operational phases of the Project will provide an economic stimulus (additional jobs, project contracts, new spending etc) to the local economy, as well as support the emergence of the region's renewable energy sector.

Population estimates, which are shown in Table 2.1, are based on official population projections prepared by New South Wales government and the most recent ABS estimated resident population figures for 2019.

Table 2.1: Population Projections – Study Area, 2020-2036 (No. of Persons)

	2020	2036	Average Annual Growth 2020-36	
			No.	%
<u>Population (no.)</u>				
Dubbo Regional (A)	54,044	57,980	+246	+0.4%
Mid-Western Regional (A)	25,367	26,595	+77	+0.3%
Warrumbungle Shire (A)	9,209	7,861	-84	-1.0%
Study Area	88,620	92,436	+239	+0.3%
Regional NSW	2,800,326	3,046,540	+15,388	+0.5%

Sources: ABS, 3218.0 Regional Population Growth, Australia; Department of Environment and Planning – NSW State and Local Government Population Projections 2019

Notes: Figures rounded

2.2 Labour Force

As of June 2021 (latest available), the Study Area had an unemployment rate of 4.0%, which is significantly lower than the rate for NSW (6.0%). The Study Area currently at that time had approximately 1,800 job seekers who were unemployed. This information is sourced from the Australian Government – *Small Area Labour Markets* data.

The Project is likely to require 580 workers (at the Project's peak), with potentially 70% of these workers (410 workers) sourced locally or from within the Study Area, providing new opportunities for unemployed job seekers (subject to appropriate skills match).

In the context of the Study Area's large labour market comprising 44,800 persons as shown in Table 2.2, the construction phase of the Project is unlikely to cause labour supply issues, rather provide new short-term opportunities for labour force participants even allowing for demands from other infrastructure projects proposed for the local area (refer to section 3.3).

Labour supply factors are further explored in Chapter 3.

Table 2.2: Resident Labour Force Statistics – Study Area, June 2020 (No. of Persons)

Municipality / Area	Employed	Unemployed	Labour Force	Unemployment Rate
Dubbo Regional (A)	26,065	1,144	27,209	4.2%
Mid-Western Regional (A)	12,969	433	13,402	3.2%
Warrumbungle Shire (A)	3,970	219	4,189	5.2%
Study Area	43,004	1,796	44,800	4.0%
New South Wales	4,086,000	262,400	4,348,400	6.0%

Source: Australian Government Department of Education, Skills and Employment, *Small Area Labour Markets*, June Quarter 2020

Note: Figures rounded.

2.3 Occupational Structure

The skills base of the Study Area is reflected in its occupational structure, as indicated in Table 2.3. ABS Census data for 2016 shows 34.6% of employed residents in the Study Area were occupied in activities generally associated with the types of skills required for the construction of a solar farm (e.g., technicians and trades workers, machinery operators and drivers, and labourers).

The Study Area's representation in these occupations is well above State average 27.9%, indicating a generally suitable occupational base for the proposed Project is present in the region. In total numbers, approximately 12,050 workers in the Study Area are occupied in construction-related activities, highlighting the strong worker base available to support the Project.

Table 2.3: Study Area Workers – Occupational Structure, 2016

Occupation	Study Area		New South Wales	
	No.	Share	No.	Share
Managers	5,180	14.9%	456,090	13.6%
Professionals	5,620	16.1%	798,130	23.8%
<i>Technicians and Trades Workers</i>	<i>5,180</i>	<i>14.9%</i>	<i>429,240</i>	<i>12.8%</i>
Community and Personal Service Workers	4,130	11.8%	350,260	10.4%
Clerical and Administrative Workers	4,130	11.8%	467,980	14.0%
Sales Workers	3,480	10.0%	311,410	9.3%
<i>Machinery Operators and Drivers</i>	<i>2,770</i>	<i>7.9%</i>	<i>206,840</i>	<i>6.2%</i>
<i>Labourers</i>	<i>4,100</i>	<i>11.8%</i>	<i>297,890</i>	<i>8.9%</i>
Inadequately described	270	0.8%	36,180	1.1%
Total	34,860	100.0%	3,354,010	100.0%

Source: ABS, Census of Population and Housing, 2016, TableBuilder – Usual Place of Residence

Note: Figures rounded.

2.4 Business Structure

A tangible benefit of a major investment project, such as the proposed Project, is the extent to which local businesses can participate in the Project through project contracts and other service provision.

ABS Business Count data for June 2020 (latest available) shows the Study Area includes 1,410 construction businesses and approximately 450 businesses associated with transport, postal and warehousing service, with these two sectors contributing 1,860 businesses or 20.6% of all businesses located in the Study Area.

This data, which is included in Table 2.4, indicates a strong presence in the Study Area of the types of firms that are likely to be well-placed to service aspects of the Project. This opportunity is explored in more detail in the following Chapter.

Table 2.4: Business Structure – Study Area, 2020

Sector	Non- employing	1-19 Employees	20-199 Employees	200+ Employees	Total Businesses	
	no.	no.	no.		no.	%
Agriculture, Forestry and Fishing	1,995	722	25	0	2,742	30.4%
Mining	27	15	0	0	44	0.5%
Manufacturing	136	128	15	0	292	3.2%
Electricity, Gas, Water and Waste Services	12	4	0	0	22	0.2%
Construction	822	562	22	0	1,410	15.6%
Wholesale Trade	105	104	8	0	217	2.4%
Retail Trade	175	267	16	0	460	5.1%
Accommodation and Food Services	144	243	27	0	419	4.6%
Transport, Postal and Warehousing	293	148	9	0	448	5.0%
Information Media and Telecommunications	17	11	0	0	29	0.3%
Financial and Insurance Services	388	58	3	0	449	5.0%
Rental, Hiring and Real Estate Services	573	83	3	0	657	7.3%
Professional, Scientific and Technical Services	278	249	6	0	530	5.9%
Administrative and Support Services	133	118	8	0	251	2.8%
Public Administration and Safety	8	11	3	0	16	0.2%
Education and Training	49	41	3	0	97	1.1%
Health Care and Social Assistance	240	153	11	3	408	4.5%
Arts and Recreation Services	40	31	3	0	75	0.8%
Other Services	221	219	7	0	455	5.0%
Currently Unknown	4	5	0	0	9	0.1%
Total	5,672	3,159	185	3	9,025	100.0%

Source: ABS, Counts of Australian Businesses, including Entries and Exits, June 2016 to June 2020

2.5 Township Services Capacity

Accommodation

An audit has been undertaken of commercial and private accommodation within the Study Area's major townships. These townships generally represent a maximum drivetime of 70-minute drive from the Project Area.

The Study Area has a good supply and mix of accommodation including motels, hotels, guest houses, caravan/holiday parks (including cabins). Most accommodation options are located in Dubbo and Mudgee (refer to Table 2.5), which are within relatively close proximity to the Project Area and provide a regional-level services; however, there are also options in smaller townships located closer to the Project Area including Gulgong and Coolah.

The following accommodation was available in the Study Area as of October 2021:

- 1,678 hotel, motel and serviced apartment rooms
- 250 cabins (caravan/holiday parks)

Table 2.5: Commercial Accommodation in the Study Area, January 2020

Locality	Establishments	Rooms	Cabins	Total
Dunedoo	5	33	3	36
Gulgong	8	114	12	126
Dubbo	39	1,040	80	1,120
Mudgee	23	362	115	477
Coolah	3	13	na	13
Mendooran	1	na	na	na
Wellington	10	116	40	156
Study Area Total	89	1,678	250	1,928

Source: Ethos Urban; Trip Advisor; Hotels.com; na: not available

Room Occupancy Rates

While official room occupancy rates are unavailable at a local level, the Australian Government's Tourism Research Australia Accommodation Monitor 2020/21 shows the Central NSW Tourism Region, in which the Study Area is located, had an annual room occupancy rate of 66.9% which is significantly above the NSW occupancy rate of 47.4%. The Accommodation Monitor 2020/21 specifically measures the impact on COVID-19 on accommodation operators.

A comparison against the pre-COVID 2018/19 Accommodation Monitor shows the Central NSW Tourism Region's annual room occupancy rate has increased by +3.5% (from 63.4%) since 2018/2019; in contrast Sydney's annual room occupancy rate has more than halved from 83.4% to just 41.3% over this period.

When benchmarked across other NSW regional tourism regions, the Central Tourism Region's room occupancy rates for 2020/21 were above the regional average of 59.0%, (which is down slightly from the pre-COVID 2018/19 rate of 60.6%).

This official government information indicates that despite a small uptick in room occupancy during the COVID pandemic, reasonable capacity exists in commercial establishments across the Study Area to cater for Project workers who require this type of accommodation. Room occupancy rates

are likely to be much lower during the off-peak holiday seasons, freeing up additional capacity during these times.

Australian Accommodation Monitor results for 2018/19 and 2021/21 are summarised in Table 2.6.

Table 2.6: NSW Commercial Room Accommodation Occupancy Rates by Tourism Region, 2018/19 and 2020/21

Tourism Region	Pre-COVID Room Occupancy Rate 2018/19	COVID Room Occupancy Rate 2020/21	Change
Sydney	83.4%	41.3%	-42.1%
Blue Mountains	61.3%	56.1%	-5.2%
Capital Country	54.7%	53.3%	-1.4%
Central Coast	66.1%	62.2%	-3.9%
Central NSW	63.4%	66.9%	+3.5%
Hunter	67.2%	63.8%	-3.4%
New England North West	55.7%	54.7%	-1.0%
North Coast NSW	65.7%	67.6%	1.9%
Outback NSW	np	np	np
Riverina	68.1%	61.6%	-6.5%
Snowy Mountains	41.1%	52.6%	+11.5%
South Coast	66.1%	59.1%	-7.0%
The Murray	57.5%	51.3%	-6.2%
New South Wales	78.0%	47.4%	-30.6%

Source: Australian Government Abare, Australian Accommodation Monitor 2018/19 and 2020/21.

Private Accommodation

Private accommodation is often used to support construction worker needs. This could be through leasing of holiday homes and investment properties, either privately (including Airbnb), or through real estate agents.

As Table 2.7 shows, 13.2% of Study Area dwellings (4,540 dwellings) were unoccupied at the 2016 Census, which is notably higher than the average for NSW (9.9%). Warrumbungle and Mid-Western Regional LGAs have a significant share of unoccupied dwellings (17.8% and 15.9%) or 760 and 1,660 dwellings respectively, which is likely related to a large number of holiday homes in this well toured area. Shared private housing accommodation is one potential option for Project workers, with some of the Study Area's unoccupied dwellings having the potential to enter the housing market to support the construction phase of the Project.

Data sourced from www.airdna.co shows approximately 650 active short-term rentals are currently advertised on Airbnb and Vrbo in the Study Area (October 2021). These active rentals have an average of 2.6 bedrooms per rental. Therefore, in the order 1,690 rooms could be available in the Study Area through the short-term rental market.

Table 2.7: Unoccupied Dwellings – Study Area, 2016

Municipality/ Area	No. Occupied Private Dwellings	No. Unoccupied Private Dwellings	Total No. Private Dwellings	Share of Unoccupied Private Dwellings
Dubbo Regional (A)	17,470	2,110	19,590	10.8%
Mid-Western Regional (A)	8,770	1,660	10,430	15.9%
Warrumbungle Shire (A)	3,520	760	4,280	17.8%
Study Area	29,760	4,540	34,290	13.2%
New South Wales	2,604,320	284,740	2,889,060	9.9%

Source: ABS, Census of Population and Housing, 2016

Note: Figures rounded

Township Services

In addition to accommodation, workers locating temporarily to the Study Area will require a wide range of other convenience services, and the Project will also need to source trade, equipment hire, vehicle mechanical services, and other services from businesses located in the immediate region.

The following sections provide an overview of the services located in the regional centres and main townships, which are listed in order of driving distance from the Project Area.

Gulgong

Gulgong, a township of some 1,955 persons (ABS Census 2016) is located in Mid-Western Regional Council and is situated around 8km south east of the Project Area. Founded as a gold mining settlement, today the township predominantly functions as a service hub for local agricultural activities.

The township offers a limited range of facilities and services, including:

- Commercial accommodation – 3 motels and a hotel (Prince of Wales Gulgong)
- Gulgong Timber and Hardware
- Automotive Mechanics
- Industry – Macquarie Geotech (soil testing), Ace Engineering etc.
- Supermarkets – Supa IGA and Coles
- Cafes, bakeries, restaurants and take-away
- Commonwealth Bank branch
- Fuel supplies (Shell and BP)
- Postal Services
- Entertainment (parks, hotels, clubs, sports and recreational activities – swimming pool, bowls club etc)
- Gulgong District Hospital – small local hospital

- Education – primary and secondary schools (both public) and a Catholic primary school (All Hallows Primary School).

Dunedoo

Dunedoo, with a population of approximately 750 persons (ABS Census 2016), is located 30km to the north of the Subject Area, or a 25-minute drive. Situated at the intersection of the Castlereagh and Golden highways, Dunedoo is a small township located along the Talbragar river and traditionally known for its history including mining, agriculture, military and Aboriginal heritage.

Key services in Dunedoo include:

- A limited range of commercial accommodation options (see Table 2.5 above)
- Dunedoo Memorial Health Service – a small regional hospital.
- Dunedoo Supermarket – a small convenience grocer
- Entertainment & Dining – various small cafes, Dunedoo Sports Club (access to Golf Course, squash, tennis and touch football areas) and Hotel Dunedoo
- Fuel Supplies – Caltex and Shell
- Postal Services
- Education – Dunedoo Central School

Service industry in Dunedoo is limited, as the township is principally residential in nature and mainly supports agricultural activities for the wider municipality.

Mudgee

Mudgee, with a population of some 10,965 persons, is the regional service centre for the Cudgong River Valley region and Mid-Western Regional Council. The township is located approximately 40km south east from the Project Area (direct line distance) and about a 30-minute driving distance by car. While the Mudgee district is historically noted for gold mining, the township now operates as a regional services hub for local agriculture including viticulture, sheep and cattle grazing, cropping etc, as well as mining (Ulan Coal Mines).

The level of services/facilities available in Mudgee is generally consistent with the township's regional service role, and includes:

- A wide range of commercial accommodations options (hotels, motels, caravan parks etc), as outlined above
- Mechanic and trade supplies – Bunnings, Furney's Building & Plumbing Supplies and Supercheap Auto
- Construction and transport services including Coates Hire, Westrac CAT, Mid State Freight.
- Supermarkets – full-line Coles and Woolworths supermarkets, as well as ALDI
- Cafes, bakeries, restaurants and take-away
- Range of commercial and financial institutions – banks, solicitors, conveyancing etc
- Fuel supplies & Automotive Mechanics

- Entertainment (parks, hotels, clubs, sports and recreational activities)
- Education – primary and secondary schools (both public), and a Catholic primary school (St Matthew's Catholic School)
- Medical and emergency services (Mudgee District Hospital, police station etc)

Additionally, Mudgee Airport operates as a regional airport within NSW's Mid-Western Region. Fly Pelican commenced passenger operations between Mudgee and Sydney in 2015 and currently operates 20 flights per week between the two destinations.

Coolah

Coolah, a township of some 795 persons (ABS Census 2016) is located centrally in Warrumbungle Shire Council and is situated around 70km north east of the Project Area. The township predominantly functions as a service hub for local agricultural activities gateway to the Coolah national park.

The township has a moderate range of facilities and services, including:

- Commercial accommodations – including a motel and caravan parks
- Coolah Multipurpose service – medium regional medical centre
- Supermarkets – IGA plus Liquor
- Cafes, bakeries, restaurants and take-away
- Fuel supplies (Shell, BP and Independent)
- Postal Services
- Automotive Mechanics
- Entertainment (parks, hotels, clubs, sports and recreational activities – golf course, swimming pool, bowls club etc)
- Education – one private primary school and a government kindergarten to year 12 combined school.
- Limited industry – Haynes Farm and Hardware, Coolah Auto Smash & Mechanical, Leigh's Auto Centre and Coolah Custom Cars.

Dubbo

Dubbo located some 117km south west of the Project Area (approximately 80-minute drive), is the major regional centre for NSW's Central West region and has a population of 34,340 persons. Dubbo provides significant access to major civic, education, health and commercial services for an expansive rural area comprising a network of many smaller towns.

Key services in Dubbo include:

- Wide range of commercial accommodation options (refer to section 2.5) – in view of the town's regional service role, as well its strategic location as the half-way point for vehicles travelling between Queensland and Victoria (via the inland route).
- Large range of retail services including the following malls/shopping centres:

- Dubbo City Centre (anchored by Coles and Target)
- Orana Mall (anchored by Woolworths and Big W)
- Riverdale Shopping Centre (anchored by Woolworths and Reading Cinema).
- Large range of professional/commercial services – solicitors, accounting, conveyancing etc.
- Major banks and financial institutions
- Entertainment – parks, hotels, clubs, sports and recreational activities.
- Dubbo Airport, which accommodates 200 passenger flights per week (pre-COVID-19) to and from destinations including Sydney, Brisbane, Canberra, Melbourne, as well regional centres such as Newcastle and Broken Hill. Four airlines operate from Dubbo Airport: Fly Pelican, Fly Corporate, Qantas Link and Regional Express.
- Dubbo Base Hospital – operates as the major regional hospital with emergency department for the Central West region of NSW. The hospital has received several major upgrades over recent years.
- Education – Dubbo's network of education institutions comprises four tertiary institutions (Charles Sturt University, University of Sydney – School of Rural Health, TAFE Western Dubbo College and Western College); three private secondary schools and three public secondary schools; and a range of primary and early education facilities.

Importantly, Dubbo has an expanded range of service industry geared to civil construction works. Key businesses include:

- John Holland (depot)
- Inland Petroleum (bulk fuel delivery)
- NACAP Depot (bespoke equipment for civil projects – roads, mining, dams etc)
- MCR Modules (portable building construction)
- EMS (depot)
- Cobra (plant and crane hire)
- Cole for Cranes (crane hire)
- Ezyquip Hire (earthmoving equipment hire)
- Rod Pilon Transport

Wellington

Wellington, with a population of 4,520 persons, is located approximately 75km direct line distance to the south of the proposed Project Area. Situated in the Macquarie River Valley and in the shadow of the Mount Arthur Range, Wellington functions as a local service hub for surrounding agriculture aspects, as well as visitors to the Wellington Caves Complex, Lake Burrendong State Park, and Mount Arthur Reserve. In addition, two prisons are in proximity to the town: Wellington Correctional Centre and Macquarie Correctional Centre, which provide local employment.

Key services in Wellington include:

- A limited range of commercial accommodation options (see Table 2.5)

- Wellington District Hospital – a small regional hospital with an emergency department
- Two full-line supermarkets – Coles and Woolworths
- Entertainment & Dining – Federal Hotel, Court House Hotel, Wellington Hotel, Central Hotel Wellington and Calf & Cow Hotel; cafes/restaurants include Smoko & Lunches, Cactus Café & Gallery, Chinese and Thai food restaurants, and KFC and McDonalds
- A limited collection of commercial and financial services, including Commonwealth and NAB branches
- Fuel Supplies – Caltex, BP, Metro Petroleum
- Postal Services
- Education – two primary schools (Catholic and public), a secondary school (public) and a TAFE NSW Campus (Wellington TAFE)
- Train Station – Wellington Station is situated in the Central West line which has a daily service operating between Sydney and Dubbo.

Service industry in Wellington geared to major civil construction works is limited. Wellington Sand & Gravel (quarries/landscaping products) is most noted in this context.

Mendooran

A township of some 270 persons (ABS Census 2016), Mendooran is located in the south in Warrumbungle Shire Council and is located approximately 80km north west of the Project Area. The township contains very limited retail and commercial offerings with the following service available:

- Auto Mechanic
- Hardware Store
- Pub (Royal Hotel) containing accommodation
- News agency and general store.
- Independent service station
- Bakery
- Bowls Club
- Post Office

2.6 Summary

The key findings of this Regional Economic Profile are as follows:

- 1 The population of the Study Area (Local Government Areas (LGAs) of Dubbo, Mid-Western and Warrumbungle) totalled 88,620 persons as of June 2020 (ABS Estimated Resident Population 2020). Over the period 2020-2036, annual population growth in the Study Area is expected to be +0.3% pa compared to the New South Wales growth rate of 0.5% p.a. The Warrumbungle LGA is projected to experience population decline over the coming years. In this regard local investment projects (such as the proposed Project) can generate new employment opportunities for residents and diverse income streams for local farmers. These

factors may contribute to retaining, and potentially expanding, population levels within this area.

- 2 Department of Education, Skills and Employment data shows the Study Area had an unemployment rate of 4.0% in June 2020, compared to the NSW rate of 6.0%; with approximately 1,800 jobseekers unemployed. The Project provides new short-term employment opportunities for the region's labour force participants (including unemployed job seekers, subject to suitable skills match), with a small amount of ongoing employment also supported once the facility is operational.
- 3 The Study Area's occupational and business structures indicate a good base exists to service the needs of the Project, with approximately 12,050 workers and 1,860 businesses in the Study Area involved in construction-related activities.
- 4 The major regional cities/townships of Dubbo and Mudgee have the capacity and labour force to service many aspects of the Project, with smaller settlements such as Gulgong, Wellington, Dunedoo and Coolah, also likely to provide labour, accommodation and other general services to the Project.

3 Economic Impact Assessment

3.1 Project Investment

The total construction cost for the Project is estimated to be approximately \$1,183,595 million (or \$1.2 billion rounded), according to information provided by the Proponent. Major investment costs are associated with the purchase of PV panels and associated equipment, although significant investment is also required for civil, electrical and grid connection works.

A review of confidential information from constructed renewable energy projects in Australia (based on unpublished Engineering, Procurement and Construction (EPC) data) shows approximately 15% to construction investment is retained within the host Study Area. Applying this ratio to the construction phase of the Project indicates approximately \$177.5 million in wages, contracts and other service provision will flow to the Study Area's economy over 34 months.

3.2 Project Employment

Construction Phase

Project employment is assessed in terms of direct jobs (i.e., site-related) and indirect (or flow-on) jobs in the local and wider economies (i.e., jobs that are generated through the industrial and consumption impacts of the initial investment).

Direct Construction Employment

Data provided by the Proponent indicates 270 Full Time Equivalent (FTE) jobs will be generated over the construction phase, which is expected to be up to 34 months. That is, on average 270 FTE jobs will be sustained for each of the 34 months of construction activities. However, actual on-site workforce numbers will vary from month to month depending on the intensity of construction at the time. At the Project's peak, which may last up to six months, the Proponent estimates 580 positions will be supported on the site.

Based on available EPC data from constructed regional-based utility-scale solar farm projects, the likely composition of the construction workforce is as follows:

- 70% of jobs sourced from within the Study Area
- 30% of jobs sourced from outside the Study Area

Construction-related jobs are expected to be associated with a wide-range of on and off-site activities, including:

- Labour recruitment
- Training
- Installation of PV support structures
- Vehicle and equipment hire
- Earthworks
- Foundations
- Engineering services

- Roads and access tracks
- Transport and logistics
- Assembly and installation of PV panels
- Electrical works (cabling and connections)
- Installation of monitoring equipment
- Fencing
- Landscaping
- Security
- Waste disposal
- Business and financial services
- Administrative services.

As indicated in Chapter 2, the business structure of the Study Area indicates that a good mix of these types of services is available in the Study Area, especially in Dubbo and Mudgee. It is reasonable to expect, therefore, that businesses located in the Study Area will be well-positioned to provide services and secure contracts during the construction phase of the Project either directly or indirectly (see below).

Indirect Construction Employment

In addition to direct employment, significant employment will be generated indirectly through the employment multiplier effect. By applying an industry-standard multiplier for the construction industry of 1.6 (based on ABS Type B multipliers), the Project is estimated to generate an additional 430 FTE jobs over the construction period.

Indirect or flow-on jobs (which captures industry and consumption effects) include those supported locally and in the wider economy (including within other parts of NSW, and nationally), as the economic effects of the capital investment flow through the economy. Indirect employment creation in local and regional economies would include jobs supported through catering, accommodation, trade supplies, fuel supplies, transportation, food and drink etc.

For the purposes of this assessment, it is assumed 20% of indirect jobs or 85 FTE jobs (rounded) are supported in the Study Area. This assumption is made with reference to findings from completed renewable energy projects in regional areas (see above) and recognises the relative proximity of the Project Area to major supply chains and service sectors located in Dubbo and Mudgee.

Total Construction Employment

In summary, approximately 700 FTE jobs (270 FTE direct jobs and 430 FTE indirect jobs) are expected to be generated by the Project during the 34-month construction phase.

The amount of direct Study Area employment (i.e., on-site) required for the Project is estimated to be approximately 190 FTE jobs (or 70% of the construction workforce), with a further 85 FTE jobs supported indirectly in the Study Area (i.e., off-site).

This number direct and indirect Study Area jobs (275 FTE workers) represents only 2.3% of the Study Area's labour force occupied in construction-related activities (12,050 workers) – and also

noting that many of the indirect jobs will be supported in non-construction sectors (e.g., services sector). Generally, this workforce requirement should not present a constraint to labour supply for the Project; however, cumulative impacts of competing infrastructure projects also need to be considered and these are discussed further in section 3.3.

Operational Phase

Direct Operational Employment

The Proponent indicates that 7 FTE direct jobs will be supported locally (on-site) on an ongoing basis through the operation and maintenance of the Project.

Indirect Operational Employment

A number of additional jobs will also be supported indirectly through the employment multiplier effect. By applying an industry-standard multiplier for the electricity industry of 2.9 (based on ABS Type B multipliers) to the direct operational and maintenance jobs, a further 20 FTE permanent jobs (rounded) would be generated in the wider State and national economies, with some of these jobs supported locally through operational supply chains and consumption impacts.

Operational-related employment is for the lifetime of the Project (i.e., 35 years); therefore, while ongoing job creation is relatively small, it represents new long-term employment opportunities at a local, regional and national level.

For the purposes of this assessment, it is assumed that 20% of indirect operational jobs are created in the Study Area (refer to previous assumption). This equates to approximately 4 ongoing FTE Study Area positions.

Total Operational Employment

In summary, approximately 27 FTE jobs (7 FTE direct and 20 FTE indirect) are expected to be generated by the Project, with 11 FTE positions supported in the Study Area.

3.3 Cumulative Effects Assessment

The Project is likely to need to compete for labour, accommodation, and other resources with major infrastructure projects concurrently in the Study Area (principally renewable energy projects being driven by the CWO REZ) Identified projects located within a 100km radius of the Project Area and their current development status are outlined in Table 3.1.:

Table 3.1: Potential Major Renewable Energy Projects Located within 100km of Project Area

Renewable Development	Developer / Owner	Details	Status
Crudine Ridge Wind Farm	CWP Renewables	134 MW wind farm, 37 wind turbines, 45 km south of Mudgee	Under construction
Wellington Solar Farm	Lightsource bp	200 MW solar farm, 7 km northeast of Wellington adjacent to proposed Wellington North Solar Farm	Under construction
Suntop Solar Farm	Photon Energy	189 MW(DC) solar farm, near Wellington	Under construction
Gilgandra Solar Farm	Neoen	50 MW solar farm, 25 km south of Gilgandra	Approved
Liverpool Range Wind Farm	Tilt Renewables	Up to 1,000 MW wind farm with up to 267 wind turbines, northwest of the Project Area near Coolah	Approved
Wahroonga Solar Farm	ITP Development	5 MW solar farm, west of Dubbo	Approved
Maryvale Solar Farm	Photon Energy	196 MW(DC) solar farm, north of Wellington	Approved
Wollar Solar Farm	Wollar Solar Development	290 MW solar farm, east of Project Area	Approved
Quorn Solar Park	Renewable Energy Developments	80 MW solar farm with energy storage, north of Parkes	Approved
Molong Solar Farm	Amp Energy	39 MW solar farm,	Approved
Barneys Reef Wind Farm	RES	350 MW wind farm, up to 63 wind turbines, immediately to the north of the Project Area	In Planning
Valley of the Winds Wind Farm	UPC\AC Renewables	800 MW wind farm, up to 175 wind turbines, 45 km north-northeast of Project Area, near Coolah	In Planning
Dunedoo Solar Farm	ib vogt	55 MW solar farm with energy storage, 30 km north-northwest of the Project Area	Approved
Stubbo Solar Farm	UPC\AC Renewables	400 MW solar farm with energy storage, 5 km east of Project Area	Approved
Suntop Stage 2 Solar Farm	Photon Energy	165 MW solar farm with energy storage and synchronous condenser, southwest of Wellington	In Planning
Wellington North Solar Farm	Lightsource bp	400 MW solar farm, 7 km northwest of Wellington adjacent to Wellington Solar Farm	In Planning
Uungula Wind Farm	CWP Renewables	400 MW wind farm, up to 97 wind turbines, east of Wellington	In Planning
Mumbil Solar Farm	Epuron	150 MW solar farm, 15 km south of Wellington	In Planning
Orange Community Renewable Energy Park	ITP Development	5 MW solar farm with energy storage, west of Orange	In Planning
Eglington Solar Farm	Neoen	200-250 MW solar farm, 6 km north of Bathurst	In Planning
Blandi Heights Solar Farm	Vena Energy	200 MW solar farm with energy storage, immediately to the south of the Project Area	In Planning
Birawa Solar Farm	UPC\AC Renewables	600 MW solar farm with energy storage 15km south west of Dunedoo	In Planning

Source: Tallawang Solar Farm Scoping Report, Umwelt (July 2021)

Additionally, several large non-renewable projects are also located in the Study Area, including the operational Ulan Coal Mine Complex (located approximately 25 km east of the Project Area), Wilpinjong Mine (30 km south-east) and Moolarben Coal Complex (36 km east of the Project Area).

In relation to proposed renewable energy projects, the following is noted:

- Projects which are currently under construction are likely to be completed prior to the Tallawang Solar Farm project's construction phase commencing
- The development status of the remaining projects varies, some projects are approved (but construction has yet to start) and others are going through the planning process; therefore, construction timing is uncertain and not all projects may end up proceeding.
- New developments, currently not in the planning system, may emerge in the period prior to construction of the Project especially as the CWO REZ matures.
- The Project is scheduled to be constructed concurrently with the nearby 350 MW Barneys Reef Wind Farm (both to be developed by the Proponent). This will generate significant activity, resource requirements and accommodation needs in this general area - especially when the peak periods of both projects overlap.

The above factors indicate negative impacts are possible if appropriate management and planning initiatives are not put in place.

Sections 3.4 and 3.5 include an assessment of potential cumulative impacts on labour, business participation, housing and accommodation sectors; while also outlining potential benefits arising from the construction phase of the Project.

3.4 Labour Force and Business Participation Assessment

In terms of cost efficiencies (lower transport, labour costs etc), many large construction projects located in regional areas are, where possible, serviced locally or from within the immediate region.

The Study Area has significant capacity in terms of construction-related workers (12,050 workers) and construction-related businesses (1,800 businesses), including many located in the immediate region and this overall capacity is likely to be able to service concurrent infrastructure projects subject to careful management.

Additionally, the Study Area currently contains 1,800 unemployed labour force participants, some of whom could work on the Project and/or other major infrastructure projects (subject to suitable skills mix). Alternatively, unemployed jobseekers may play a 'backfill' role in the labour market, engaging in jobs vacated by other workers transferring to employment on the Project or other major infrastructure projects.

The Proponent commits to honouring the Clean Energy Council's Best Practice Charter (www.cleanenergycouncil.org.au/advocacy-initiatives/community-engagement/best-practice-charter) for renewable energy developments and associated transmission infrastructure: The Proponent will support the local economy by providing local employment and procurement opportunities wherever possible. Once appointed, the EPC contractor will organise contractors, suppliers and hire workers in line with these local procurement commitments.

The Project has a website (www.tallawang-renewableenergy.com) where potential workers and businesses can register their interest to supply services to the Project and receive updates on the timing of the project.

Given a level of uncertainty exists regarding labour force and supplier availability in the Study Area due to identified cumulative impacts together with the desire to maximise local inputs, the Proponent may consider preparing a workforce plan/strategy (refer to Chapter 7 – Proposed Mitigation Measures) to guide the sourcing of local employment and suppliers based on market conditions in the lead up to the construction phase of the Project commencing.

3.5 Housing and Commercial Accommodation Sector Impacts

Project Accommodation Needs and Study Area Capacity

Data provided by the Proponent indicates 175 non-local staff may need to be accommodated in the region at the Project's peak (which is likely to last for several months).

This calculation is based on 30% of the 580 peak on-site workers coming from outside the Study Area and requiring accommodation. This level of accommodation relates to the Project's peak only, which might last for up to six months. The average number of non-local staff requiring accommodation across the 34 months is estimated at 80 workers (noting this number will be much lower during periods of low site activity).

These temporarily relocating staff are likely to include general managers, project managers, supervising engineers and solar specialists. Contract lengths will vary. This highlights the need for range of accommodation types including higher-end options for staff on longer contracts, to convenient low-cost options for those on short-term contracts.

As outlined in Chapter 2, the Study Area currently has a capacity of approximately 1,930 rooms and cabins in commercial accommodation in locations within a 70-minute drive of the Project Area. Assuming each non-local worker requires individual accommodation (175 rooms), 9% of this accommodation stock would be required at peak times to service the Project if all workers chose this type of accommodation. However, this requirement is likely to be much lower as many workers are likely to choose to be accommodated in caravan/holiday parks (powered sites), B&Bs, shared private rentals (e.g., holiday homes, Airbnb) or stay with family or friends (where possible) rather than in commercial accommodation. Additionally, other workers may share motel rooms/cabins etc to reduce personal costs. Currently there are 650 private short-term rentals available in the Study Area, potentially yielding 1,690 rooms; while an additional 4,540 unoccupied dwellings are recorded in the Study Area, some of which may be released to the market to support the Project.

While this data indicates that adequate capacity currently exists in the Study Area to accommodate the number of non-local workers expected at the peak of the Project as well as the needs of the adjoining Barneys Reef Wind Farm (which would consume a further 100 rooms concurrently at its peak); increased demand from other regional infrastructure projects (refer to section 3.1) and seasonal accommodation demands (tourism, agricultural activities etc) also need to be factored in.

Tourism Sector

The Mid-Western Regional LGA attracts over 573,000 visitors each year through its viticulture, food, sport and cultural events (Mid-Western Regional Council, 2019). Visitation is underpinned by the LGA's gateway status to the Central West and Far West regions of NSW, relatively manageable drive times from Sydney, Newcastle and Mudgee (3-4 hours) and easy access to the surrounding regional centres. According to Tourism Research Australia, visitors to the Mid-Western Regional LGA spent on average three nights in the area, with a total annual spend of \$148 million dollars (Tourism Research Australia, 2017). According to the Mudgee Region Annual Report (2018), the Mudgee tourism region generated approximately \$925,000 in revenue for the year 2018.

REMLAN data shows the Mid-Western Regional LGA's tourism sector (2020/21) supports an estimated 730 jobs, which is 7.2% of total employment, including 460 jobs supported in the accommodation and food services sub-sector.

The above data highlights the importance of the Study Area's visitor economy and the important role the accommodation sector plays in supporting it. It is therefore important that sufficient capacity is maintained to cater for tourists and other visitors during the construction phase of the Project; while allowing these accommodation operators to leverage financial benefits from demand stimulated by the Project especially during off-peak visitor seasons.

It is also recognised commercial accommodation and housing market conditions are ever changing, and the current COVID-19 pandemic is a good example of this. The COVID-19 environment has led to an upsurge in migration from metropolitan to regional NSW areas; associated with workers relocating to second homes/holiday homes and other households seeking a permanent move to the regions for lifestyle reasons. ABS Regional Internal Migration Estimates show in the 12 months to March 2021 (predating the most significant NSW lockdown) approximately 25,000 people moved from Greater Sydney to regional NSW, with the biggest movement associated with people aged between 45 and 64, including many with families. Consequences of such migration patterns include upward pressure on regional property prices and rentals, a reduction in housing availability and affordability (especially at lower price points) and potentially less accommodation supply to service the visitor market.

With regard to the above factors, the Proponent may consider developing a construction workforce strategy/plan (refer to Chapter 7 – Proposed Mitigation Measures) prior to the construction phase of the Project commencing which would reflect local market conditions at the time (including demands from concurrent infrastructure projects, visitor markets etc). Such an approach would aim to minimise impacts on the community especially for those reliant on low cost housing as well as ensuring sufficient accommodation is available to service the tourism sector and other visitor markets (e.g., seasonal agricultural workers, mining workers).

3.6 Local Wage Spending Stimulus

Estimates produced by Ethos Urban indicates that 30% of the 270 direct FTE construction jobs (80 FTE jobs) may need to be sourced from outside the Study Area, particularly specialist and management positions.

This level of employment would equate to \$24.0 million in wages (2021 dollars) on the basis that each non-local worker is employed for 34 months and earns the average construction wage of \$88,250 pa including on-costs (source: ABS, *Average Weekly Earnings* 6302.0, May 2021).

A considerable portion of these wages would be spent in the Study Area, where these workers will be based. An estimated \$13.5 million in wages (2021 dollars) would likely be directed to local and regional businesses and service providers during the construction period. This estimate is based on reference to the ABS *Household Expenditure Survey* which indicates that approximately 75% of post-tax wages are likely to be spent by workers in the regional economy in view of the wide range of goods and services available in the Study Area. This spending would include the following:

- Housing expenditure, including spending on accommodation at hotels, motels, caravan/holiday parks, B&Bs, and private rental dwellings
- Retail expenditure, including spending on supermarket items, clothing, books, homewares etc
- Recreation spending associated with day trips and excursions, gaming (lottery, sports betting, etc), purchases in pubs and clubs (although noting that expenditures at restaurants is included in the retail category)

- Personal, medical and other services, such as GP fees and local prescriptions, fuel, vehicle maintenance and so on.

This level of personal spending would generate the equivalent of approximately 90 FTE jobs in the services sector (based on 1 FTE job allocated for every \$150,000 of induced spending), supporting jobs in the Study Area associated with retail, accommodation, trade supplies, cafes and restaurants etc. These jobs are included in the 'indirect employment' estimates outlined in Section 3.2 above.

3.7 Agricultural Impacts

Approximately 1,370 ha of existing agricultural land will be required to host the Project, with a development footprint of 864 ha. This land is mainly used for grazing supported by some cropping.

No loss of employment associated with the Project Area is anticipated, either directly (on-site) or through the supply chain, as some agricultural activities can continue on the balance of the four landholdings.

Additionally, the Proponent is exploring the possibility of sheep grazing on the Project Area, which would ensure some agricultural activity is retained on the host land.

3.8 Ongoing Economic Stimulus

Landowners

Local landowners involved in the Project will receive annual lease payments to host Project infrastructure (e.g., PV panels, transmission infrastructure). These payments are confidential between the Proponent and landowners.

However, as leasing landowners will continue to undertake agricultural activities on the balance of their land; it can be expected that a portion of lease revenues will be reinvested back into the local economy through business, household and individual consumption.

Community

Annual one-off payments will be made to neighbouring landowners and the broader community (e.g., community fund), with details to be confirmed in consultation with these stakeholders.

Returns to Council

Change in land use to facilitate the development of the Project will result in an increase in annual payments to Council from the site (compared with existing uses). The amount payable will be subject to discussions between the Proponent and Council; however, based on observations from similar utility scale solar farm developments in NSW, the net increase in annual revenue to Council is likely to be significant. Ethos Urban has calculated this 'net' uplift to be approximately \$600,000 in Year 1 of operations.

Local Wage Stimulus

The Project will support 11 FTE jobs in the Study Area (direct and indirect). These 11 FTE jobs will provide an estimated stimulus within the Study Area of approximately \$540,000 (2021 dollars) in Year 1 of operations. This figure assumes there will be no loss in direct or indirect agricultural jobs associated with the use of part of the land to host the Project (i.e., existing agricultural activities will continue on the remainder of the land and around Project infrastructure). Refer to section 3.6 for wage stimulus methodology.

Total Operational Stimulus

The total economic stimulus associated with the operation of the Project is estimated at approximately \$196.2 million over 35 years, (2021 dollars, CPI adjusted) relating to landowner returns, operational wage stimulus, community/neighbour payments and net land tax revenue to Council.

3.9 National Grid Supply Benefits

With an installed capacity of 500 MW, the Project has the potential to provide sufficient renewable energy to support the annual electricity needs of the equivalent of approximately 330,000 NSW households, according to information provided by the Proponent.

In a regional context, the Study Area currently contains approximately 34,290 dwellings (ABS Census 2016); therefore, the Project has the potential to provide approximately ten times the annual electricity requirements of the Study Area, highlighting the importance of the facility from a clean electrical generation perspective.

3.10 Tourism Opportunities

Over time, the Project may provide opportunities to attract new visitors to the area to view the facility and to be involved in educational and environmental activities – especially given the concurrent operation of Tallawang Solar Farm and Barneys Reef Wind Farm.

It is also noted that there are a dozen or so existing/approved or planned utility scale renewable energy facilities in the broader region (stimulated by developer interest in the CWO REZ) which may provide opportunities for linked tours to these facilities.

Benefits of attracting new visitors to the area include increased expenditures on accommodation, food and beverage, fuel, retail, entertainment etc, all of which will support businesses and employment, especially in nearby townships such as Gulgong and Mudgee.

3.11 Proposed Mitigation Measures

Accommodation, Procurement and Employment Strategy

Prior to commencing construction, it is recommended the Proponent prepare an Accommodation, Procurement and Employment Strategy (APAES) for the Project in consultation with relevant stakeholders.

This APAES might include the following:

- Measures to ensure there is sufficient accommodation for the workforce associated with the construction phase of the Project
- Measures to address any specific cumulative impacts arising associated with other State significant development projects in the area
- Measures to prioritise the employment of local workers and the procurement of local businesses for the construction and operation of the Project
- A program to monitor and review the effectiveness of the strategy over the life of the Project, including regular monitoring and review during the construction phase.

Community Benefit Programs

In order to ensure the broader community benefit from the construction and operation of the Project, it is recommended the Proponent develop Community Benefit Programs (CBP).

The CBP will:

- include a provision of annual payments to non-host properties neighbouring the solar farm benefitting landowners with land adjacent to the project boundary, whom are not directly associated with the project infrastructure.
- In addition, a Community Benefit Fund will be available to the wider community. This provision is an annual offering of money to local community organisations and programs. Guidelines and management structures for the operation of the Community Benefit Fund will be put in place.

3.12 EIA Conclusions

- 1 The Project will require approximately \$1.2 billion in investment during the construction phase (of which approximately \$180 million will be retained in the Study Area) and will support 270 direct and 430 indirect Full Time Equivalent (FTE) positions over the 34-month construction period. Once operational, 7 direct and 20 indirect FTE jobs will be supported by the Project.

Of this total, the Study Area is expected to benefit from 275 FTE construction jobs and 11 FTE ongoing jobs (includes direct and indirect jobs) associated with the Project.

- 2 The Study Area has significant capacity in terms of construction-related workers (12,050 workers) and businesses (1,800 businesses) to manage the requirements of the Project, and concurrent regional infrastructure projects if required.
- 3 The Project will provide significant participation opportunities for businesses and workers located in the Study Area, having regard for the good match of skills and resources available.
- 4 The 'external' Project labour requirement would be expected to generate an accommodation need for 175 workers at the peak of the Project. This represents 9% of total commercial accommodation rooms/cabins within a 70-minute drive of the Project Area, with significant further capacity available in caravan parks (powered sites), private rentals (e.g., Airbnb) and potentially unoccupied dwellings some of which may become available to the market to support the Project. The Project will generate new revenues for accommodation providers over the construction phase (especially in off-peak seasons) including in small townships such as Gulgong, Dunedoo and Coolah as well as for private renters.
- 5 Construction workers relocating to the region would be expected to inject approximately \$13.5 million in new spending into the economy over the construction phase, supporting approximately 90 FTE jobs in the service sector in the Study Area over this time.
- 6 Cumulative impacts are associated with significant development of major renewable energy projects in the CWO REZ in the coming years (including the adjoining Barneys Reef Wind Farm also to be developed by the Proponent) and ongoing demand from the tourism, agriculture and mining sectors. Potential impacts may include insufficient accommodation and workers to service the Project and concurrent demands. In this regard strategies to manage accommodation demand, and local procurement and employment should be considered by the Proponent (refer to Chapter 4).
- 7 Approximately 1,370 ha of existing agricultural land will be required to host the Project, with a development footprint of 864 ha. This land is mainly used for grazing supported by some cropping. No loss of employment associated with the Project Area is anticipated, either directly (on-site) or through the supply chain, as agricultural activities can continue on the balance of the four landholdings. Additionally, the Proponent is exploring the possibility of sheep grazing on the Project Area, which would ensure some agricultural activity is retained on the host land.
- 8 Ongoing economic stimulus associated with the operation of the Project is estimated at approximately \$196.2 million (over 35 years, CPI adjusted) relating to landowner returns, operational wage stimulus, community/neighbour payments and net land tax revenue to Council.
- 9 The Project has the capacity to supply sufficient clean energy to power the equivalent of approximately 330,000 homes pa, which represents approximately ten times the total annual residential requirements of the Study Area (34,300 homes).
- 10 Operation of the Project could potentially support small-scale tourism and educational opportunities in the future, especially in light of the significant development of the renewable energy sector in the CWO REZ over the coming years.

- 11 In order to minimise potential impacts and maximise benefits, the following Project mitigation measures are recommended:
- Prior to commencing construction, it is recommended the Proponent prepare an Accommodation, Procurement and Employment Strategy (APAES) for the Project in consultation with relevant stakeholders.
 - In order to ensure the broader community benefit from the construction and operation of the Project, it is recommended the Proponent develop Community Benefit Programs (CBP).