Goulburn River Solar Farm

Economic Impact Assessment

Ethos Urban

Prepared by Ethos Urban
For Lightsource bp

14 April 2023 | 3220152

'Dagura Buumarri'
Liz Belanjee Cameron

'Dagura Buumarri' – translates to Cold Brown Country. Representing Victoria.

The river system illustrated in this visual image is bound in greens and golds to acknowledge the warmth often felt in a colder climate. The rich earth hues of green, reds and browns reflect the local landscapes of this state while the extensive use of rhythmical patterning captures the unique landscapes of flat and mountainous areas. The use of earth colours imparts a sense of strength and serenity while contrasting greens throughout the image reminds us of the lushness of the natural world, where animals and humans once lived in harmony – it reminds us of the

Ethos Urban acknowledges the Traditional Custodians of Country throughout Australia and recognises their continuing connection to land, waters and culture.

We acknowledge the Wurundjeri Woi Wurrung people, of the Kulin Nation, the Traditional Custodians of the land where this document was prepared, and all peoples and nations from lands affected.

We pay our respects to their Elders past, present and emerging.

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Executive Summary

Lightsource bp (the Proponent) has commissioned Ethos Urban to prepare an Economic Impact Assessment (EIA) for a proposed 550 MWp solar farm and Battery Energy Storage System (BESS) with approximately 280 MWMW / 570 MWh capacity (the Project) to be located 25 kilometres (km) south west of Merriwa within the Upper Hunter Local Government Area (LGA).

The Project will be located across a 2,000 ha site (Project Site) comprising a number of landowners. 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 (Local Government Areas (LGAs) of Upper Hunter, Mid-Western and Muswellbrook) totalled 56,090 persons as of June 2021 (ABS Estimated Resident Population 2022 release). Over the period 2022-2036, annual population growth in the Study Area is expected to be +0.4% pa compared to the New South Wales growth rate of 1.0% p.a. The Upper Hunter 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, workers transitioning from the mining sector as well as more 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 3.1% in December 2021, compared to the NSW rate of 5.0%; with approximately 890 jobseekers unemployed. The Project may provide new short-term construction employment opportunities for the region's labour force participants (including unemployed job seekers, subject to suitable skills match and demands from other concurrent infrastructure projects), 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 10,360 workers and 717 businesses in the Study Area involved in construction-related industries.

4. The major regional townships of Mudgee and Scone have the capacity and labour force to service some aspects of the Project, while nearby smaller settlements such as Merriwa, Gulgong, Denman and Rylstone will play a more limited role in providing labour, accommodation and other general services to the Project.

Economic Impact Assessment

5. The Project will require approximately $880 million in investment during the construction phase (of which approximately $130 million will be retained in the Study Area) and will support 910 Full Time Equivalent (FTE) positions in the national economy over the 27-month construction period (350 direct FTE jobs and 560 indirect FTE jobs). Once operational, 40 FTE jobs will be supported nationally by the Project (10 direct FTE jobs and 30 indirect FTE jobs).

6. Of this national total, the Study Area is expected to benefit from 235 FTE construction jobs and 13 FTE ongoing jobs (includes direct and indirect jobs) associated with the Project.

7. The Study Area has moderate capacity in terms of construction-related workers (10,360 workers) and businesses (720 businesses) to manage the requirements of the Project, and concurrent regional infrastructure projects if required.

8. The Project will provide new participation opportunities for businesses and workers located in the Study Area, having regard for the good match of skills and resources available.

9. The 'external' Project labour requirement would be expected to generate an accommodation need for 325 FTE workers at the peak of the Project. This represents 36% of total commercial accommodation rooms/cabins within a 60-minute drive of the Project Site. However, further capacity available in caravan parks (powered sites), private rentals (e.g., long-term houses/units, short-term 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 commercial accommodation providers over the construction phase (especially in off-peak seasons) including in small townships such as Merriwa, Gulgong, Dunedoo and Coolah, and also private property owners.

10. Construction workers relocating to the region would be expected to inject approximately $30.1 million in new spending into the economy over the construction phase, supporting approximately 150 FTE jobs in the service sector in the Study Area over this time.

11. Cumulative impacts are associated with significant development of major renewable energy projects in the CWO REZ in the coming years 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 and the State Government when considering the timing of future renewable energy and major infrastructure projects in the region.

12. Approximately 2,000 ha of existing agricultural land will be required to host the Project, with a development footprint of approximately 799.5 ha. This land, which the Proponent has an option to purchase from the existing landowners, is mainly used for grazing. No loss of employment associated with the Project Site is anticipated, either directly (on-site) or through supply chains, as the Project will be compatible with sheep grazing and cattle grazing will continue outside the development boundary but within the project boundary.

13. Ongoing economic stimulus associated with the operation of the Project is estimated at approximately $120 million (over 40 years, CPI adjusted) relating to, operational wage stimulus, community and neighbourhood payments and net land tax revenue to Council.

14. 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).

15. 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 nearby CWO REZ over the coming years.

16. Decommissioning of the Project is likely to support significant employment generation, new business contracts and provide a spending stimulus to the Study Area over the decommissioning period. However, given decommissioning will not occur for at least 40 years after the operation of the Project commences, it is not possible to estimate potential impacts and benefits at this stage noting economic, technological, environmental factors may change considerably over this period.

17. While the main focus of this assessment has been on determining impacts within the Study Area, the Project will deliver the following key Statewide economic benefits:

- Capital investment: $350 million or 40% of total project capital investment (recognising the large import component associated with solar farms)
- Construction employment: 820 FTE jobs or 90% of total construction employment
- Ongoing employment: 36 FTE jobs, or 90% of total operating employment
- Supports ongoing industry transition in Regional NSW from agriculture, mining etc to renewable energy
- Future decommissioning investment and employment opportunities (to be determined).

Net Economic Benefit Assessment (Study Area)

A summary of net economic outcomes for the Study Area is included in Table A.

Table A: Goulburn River Solar Farm – Net Economic Benefit Assessment for the Study Area

Factor	Value
Negative Economic Outcomes	
Temporary loss of agricultural land (40 years)	799799.5 ha
Loss of employment (includes direct and indirect jobs)	0 jobs
Positive Economic Outcomes	
Construction Phase	
Capital investment	+$880 million
Study Area investment (including wage stimulus)	+$130 million (assumes 15% of total investment)
Construction employment (direct plus indirect jobs)	910 FTE total jobs nationally (over 27 months), including: *Study Area jobs* *125 FTE direct on-site* *110 FTE indirect off-site* *Total Study Area jobs: 235 FTE*
Operational Phase	
Operational employment (direct and indirect jobs)	40 FTE total jobs nationally (for 40 years), including: Study Area jobs *10 FTE direct on-site* *3 FTE indirect off-site* *Total Study Area jobs: 13 FTE*
Operational Economic Stimulus	
Total net local economic stimulus (operational wage stimulus, Community Benefits Fund, increased Council land tax returns).	**+$120 million (over 40 years)**
Total Economic Benefits (Construction and Operational Phases)	**+$250 million** **(Construction period PLUS 40 years operation)**
Decommissioning Phase	
Likely to generate employment, business contract and spending stimulus benefits for the Study Area	Not quantified

Ethos Urban certifies the estimate of the jobs that will be created during the construction and operational phases of the proposed project and other estimates provided in Table A are accurate at the date of preparation of this report.

18. In order to minimise potential Project impacts and maximise Project benefits, the following 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 a Community Shared Benefit Strategy (CSBS), which could include funds to be administered through a Voluntary Planning Agreement with Council.

Introduction

Background

Lightsource bp (the Proponent) is seeking to develop the proposed Goulburn River Solar Farm (the Project) to be located approximately 25 kilometres (km) southwest of Merriwa within the Upper Hunter Local Government Area (LGA). The Project sits approximately 40 km to the east of the Central West Orana Renewable Energy Zone (CWO REZ).

The Project will involve the construction, operation and decommissioning of approximately 550-megawatt peak (MWp) of solar photovoltaic (PV) generation as well as a Battery Energy Storage System (BESS) with 280 MWp / 570-megawatt hour (MWh) capacity. The Project will also include a substation and connection to an existing 500 kilovolt (kV) transmission line. The Project will include various associated infrastructure, including road repairs and upgrades to Ringwood Road and Wollara Road, temporary construction facilities, operation and maintenance buildings, internal access roads, civil works, and electrical infrastructure to connect the Project to the existing transmission line which passes through the Project Site.

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

- the solar farm, BESS and substation development footprint
- the land that contains significant vegetation and has been assessed to be 'undevelopable,'

Refer to Figure 1.1 for visual representation of Project Site.

The Project encompasses 44 land parcels, covering an area of approximately 2,000 ha. These properties are primarily used for agricultural grazing activities. The development footprint for the Project is 799.55 ha.

The Project is a State Significant Development (SSD) under the *State Environmental Planning Policy (Planning Systems) 2021* (SRD SEPP) as the capital value of the Project is over $30 million (estimated capital value for the Project is $1.1 billion). 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).

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 economic impacts, which are:

- **Economic:** including an assessment of the economic impacts or benefits of the project for the region and the State as a whole.

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 2022 and the Central West Orana Renewable Energy Zone (CWO REZ) (www.energyco.nsw.gov.au/index.php/renewable-energy-zones/centralwest-orana-renewable-energy-zone).
- 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 site visits, 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 advice from the Proponent based on experiences from previous renewable energy construction projects in similar regional locations.
- 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 Site. Importantly the introduction of the nearby 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, neighbour benefit payments, uplift in Council rates revenues, and Proponent's Community Shared Benefits Strategy payments. Construction stimulus is expressed in 2024 dollars (and calculated over 27 months), while operational stimulus is calculated over 40 years using 2022 dollars but indexed to 3.0% 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 uses in compiling this EIA:

- ABS Average Weekly Earnings, November 2021
- ABS, Counts of Australian Businesses, including Entries and Exits, June 2017 to June 2021
- ABS Census of Population and Housing, 2016 and 2021
- ABS Estimated Resident Population, 2021 (March 2022 release)
- ABS Household Expenditure Survey, 2015-16
- ABS Regional Population Growth, Australia
- NSW Tourist Accommodation Snapshot March Qtr 2022, STR.com
- Australian National Accounts: Input-Output Tables, 1998-99
- Air DNA, June 2022
- Department of Employment - Small Area Labour Markets, March Quarter 2022
- Department of Environment and Planning NSW, State and Local Government Population Projections 2022, 2022 NSW Common Planning Assumption Projections
- Mudgee Region Annual Report 2018

- SQM Research, December 2021
- Umwelt, Goulburn River Solar Farm Scoping Report, December 2021
- WT Partnership, Goulburn River PV Farm – Capital Value Investment Report, 30 October 2022
- www.energy.nsw.gov.au/renewables/renewable-energy-zones
- www.energyco.nsw.gov.au/index.php/renewable-energy-zones/centralwest-orana-renewable-energy-zone
- www.Goulburn River-renewableenergy.com
- www.tripadvisor.com

1.0 Project Context

1.1 Site Location

The proposed Goulburn River Solar Farm (the Project) will be developed on a 2,000 ha site in the Upper Hunter region of NSW, which is in proximity to a number of medium and major regional centres and towns located within approximately a 60-80 minute drive from the Project Site. These settlements are listed below (in order of 2021 population size):

- **Mudgee,** key service centre located approximately a 50-minute drive to the south west of the Project Site.
- **Muswellbrook,** medium sized township located approximately an 80-minute drive to the east of the Project Site and is a major mining town in the Hunter region.
- **Scone,** small-medium sized township located approximately a 70-minute drive from the Project Site to the north east.
- **Gulgong,** small-medium sized service centre located approximately a 60-minute drive to the south west of the Project Site.
- **Denman,** small service centre located approximately a 60-minute drive to the south east of the Project Site.
- **Merriwa,** small township located approximately a 25-minute drive to the north east of the Project Site and broadly reflects the location of the Project.
- **Rylstone,** small township located approximately a 50-minute drive from the Project Site to the south west.

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

The Project Site, which comprises 44 land parcels, is currently used for farming purposes (grazing) under the Rural Use 1 Zone (Primary Production).

The Development Footprint of the Project is 799.5 ha. It has been reduced to further avoid impacts to biodiversity including:

- Reducing the areas with overlapping habitat for Serious and Irreversible Impact entities.
- Further avoidance of clustered areas of PCT 483 with scattered tree conditions zones, particularly on the outer boundary of the Project Area.
- Avoided areas such as PCT 1607 and alignment of new road and existing tracks and roads.

As a part of the update to the Development Footprint some additional exclusion zones have also been included, such as

- Avoidance of areas required for landscaping to reduce visual amenity impacts.
- Avoidance of areas of PCT 483 Scattered Trees and heritage item (Slab Hut).
- Avoidance of Redlynch creek Strahler stream order sections 2 and 3, regent honeyeater important habitat – grassland and treed areas and PCT 483 DNG moderate to low areas.

1.2 Project Description

The Project is expected to include the following key components:

- Approximately 1 million bifacial solar panels in an east-west single-axis tracking arrangement with a maximum height of 5 metres (m) above ground level.
- A Battery Energy Storage System (BESS) with a capacity of approximately 280 MWp and 570 MWh. The location of the BESS will be centralised and located adjacent to the substation.
- One onsite switchyard and 500 kV solar farm substation, with underground electrical conduits and cabling leading into the yard and overhead lines connecting to the existing 500 kV transmission line. An additional

transmission tower may be required in order to accommodate the connection of the solar farm to the existing transmission line.

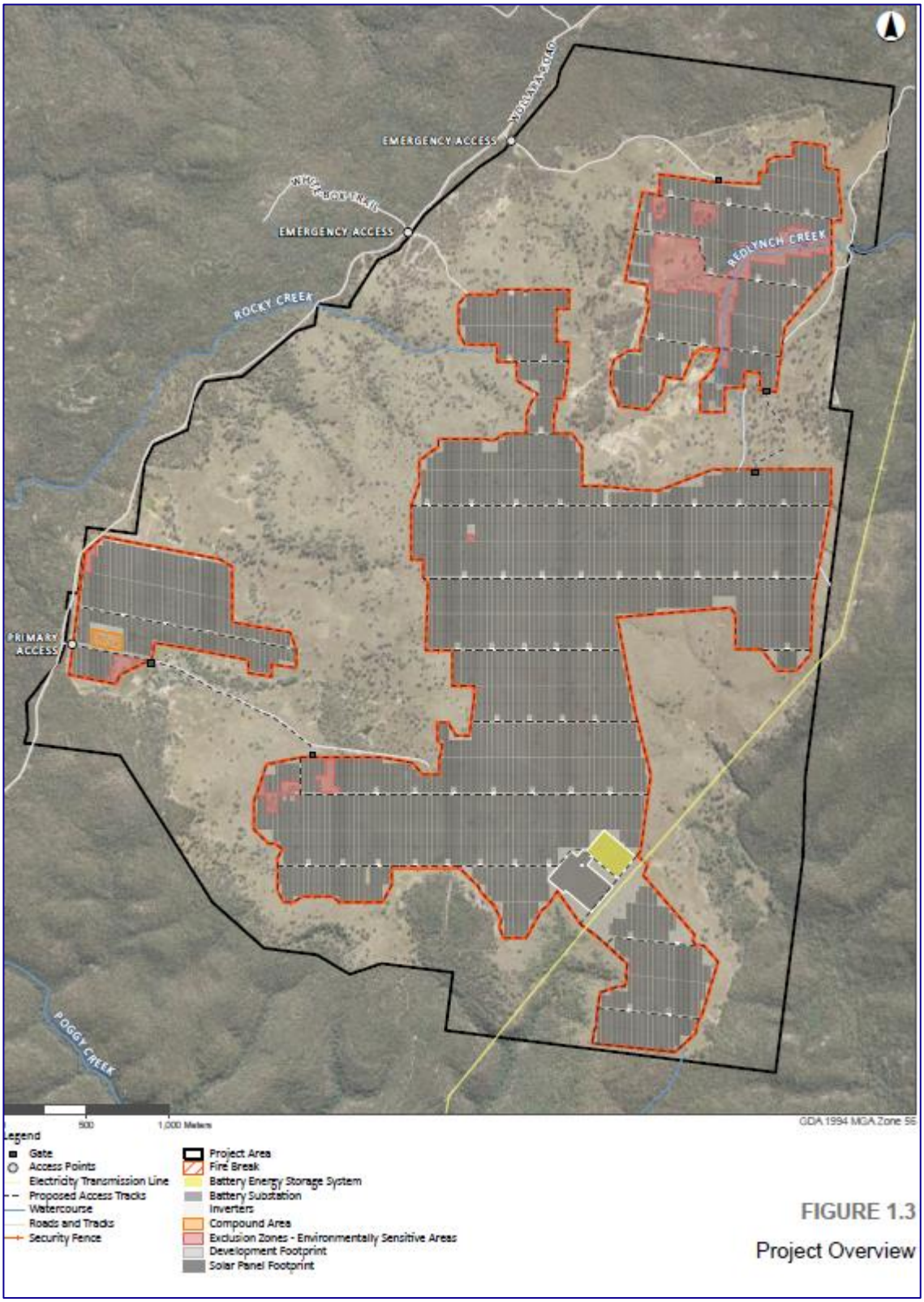
- A TransGrid 500 kV transmission line runs through Goulburn River National Park and passes through the south-eastern corner of the Project site. The Project will connect directly to the network through this transmission line, and therefore connecting the Project to the grid via the proposed NSW Government switching station.
- Site office and operations and maintenance building (including warehousing) with parking for the operations team.
- Internal access tracks to allow for site maintenance and emergency response.
- Drainage line crossings as required to manage existing surface water flows (to be determined during further design development).
- Perimeter security fencing around the development boundary and livestock fencing around the project boundary, crossing gates, water tanks or dams and secondary access points ensure the Project is compatible with sheep grazing.

The site layout is shown in Figure 1.1.

The Project would require road repairs and upgrades on Ringwood Road which would be completed prior to the commencement of further works, including:

- Upgrades to culverts at Bow and Killoe Creek located on Ringwood Road. The culvert upgrades will include:
  - Installing culverts designed to accommodate two-way heavy vehicles, including B doubles and various farm machinery.
  - Culvert width 7 m (3.5 m land width) sealed carriageway with suitable guardrail and signage and associated drainage works.
  - Stockpile site to be located on disturbed land within the road reserve in consultation with the Upper Hunter Council.
  - Temporary side track at both locations to facilitate access during construction.
- Widening and resealing of 1.8 km of Ringwood Road between Bow Creek and Killoe Creek.
  - This will include an 8 m bitumen-sealed formation with a minimum of 500mm unsealed shoulders with all works contained within the existing road corridor. The horizontal and vertical alignment of the proposed road will ensure safe sight distance, safe movement of longer vehicles, and an improved road network for the users.

Figure 1.1 Goulburn River Solar Farm - Site Layout



Source: Umwelt

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 previous target was to achieve a reduction of emissions by 5% from 2000 levels by 2020, with the previous Liberal Federal Government committed to a reduction of 26-28% below 2005 levels by 2030.

As part of Australia's obligations under the Paris Agreement, and pre-election promised by the Australian Labour Party, an updated Nationally Determined Contribution (NDC) has been submitted by the newly elected Federal Government, as of July 2022. The updated NDC includes a commitment to a bolder target of a reduction in greenhouse gas emissions by 43% by 2030, noting the previous target set by the former Coalition Government of 28% by 2030. As such the new commitment represents a 15-percentage point increase in the reduction target to 2030. The commitment of net zero emissions by 2050 remains.

NSW Large Scale Solar Energy Guidelines 2022

The NSW Large Scale Solar Energy Guidelines issued by the NSW Government notes (p.34):

> *"A social impact assessment is required for all state significant projects and must be undertaken in accordance with the department's Social Impact Assessment Guideline for State Significant Projects (PDF 2,181 KB). The assessment will include both positive and negative impacts of the proposed development on potentially affected people and groups, including how the impacts are distributed. 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.

The Central West (Orana) Renewable Energy Zone aims to produce enough energy to power up to 1.3 million homes each year. The NSW Government will set up a dedicated REZ 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. The Goulburn River Solar Farm is not located within the Central-West Orana REZ. However, due to the significant amount of renewable energy projects currently being constructed or planned for the REZ, the potential cumulative impacts of these projects are assessed in this report.

1.4 Study Area

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

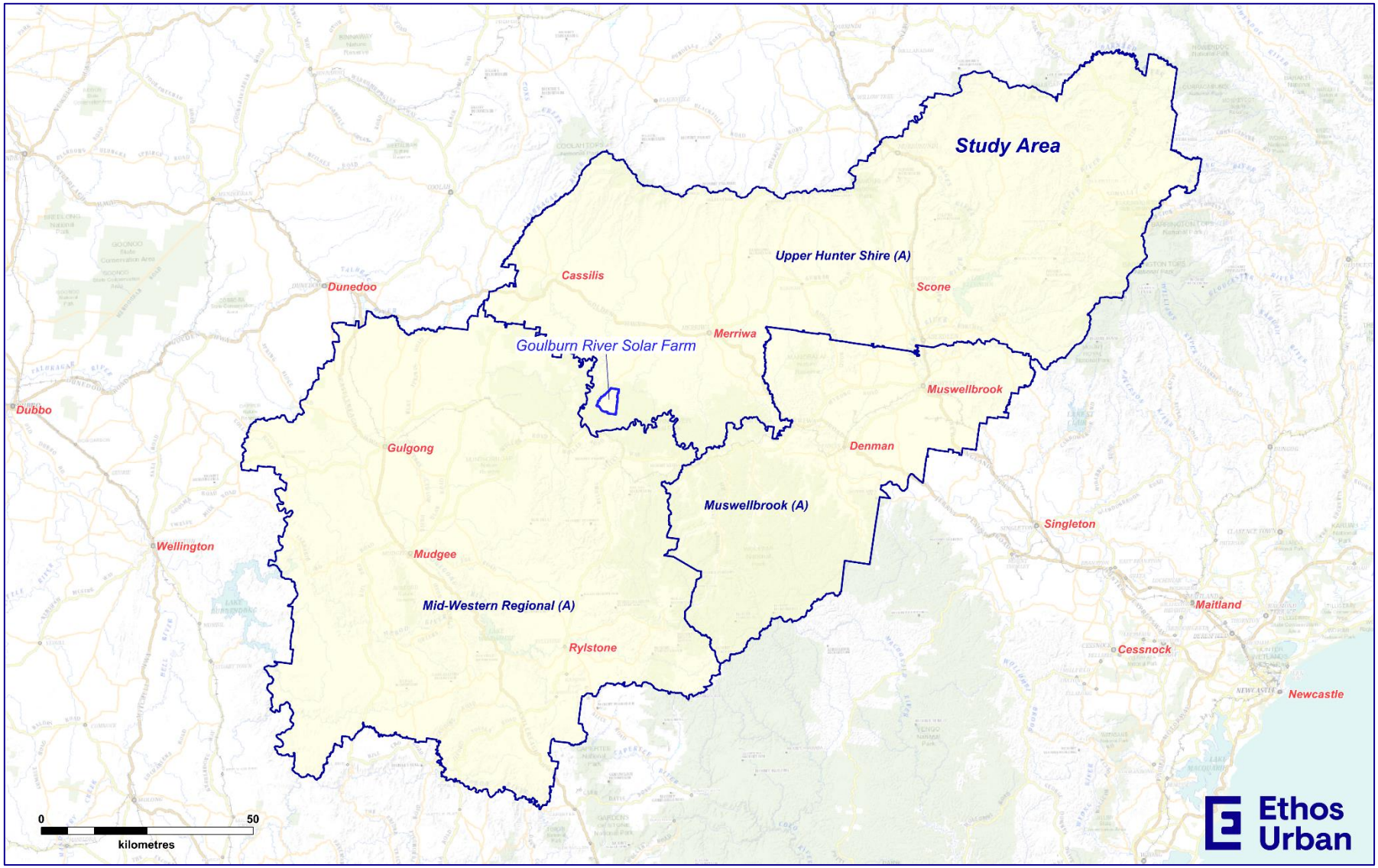
- Upper Hunter Council Shire (in which the project is to be located)
- Mid-Western Regional Council
- Muswellbrook Council Shire

The main regional cities/townships/settlements in the Study Area are all located within a 60-minute drive of the Project site.

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 1.2.

Figure 1.2 Goulburn River Solar Farm - Study Area



Source: Ethos Urban using Mapinfo, StreetPro, BingMaps

1.5 Summary

1. The Proponent is proposing the construction of the 550 MW Goulburn River Solar Farm. The Project will be located approximately 25km south west of Merriwa and is bound by Wollara Road to the west and the Goulburn River National Park on the other sides of the Project Site.

2. The Project lies in the Upper Hunter Local Government Area (LGA) in the Upper Hunter region of NSW and is well connected to the major regional centres of Mudgee and Muswellbrook.

3. The Project will be located across 44 land parcels totalling approximately 2,000 ha of agricultural land, which is currently used mainly for agricultural grazing.

4. Subject to planning approval, grid connection approval and financing; it is anticipated construction of the Project could start in 2024, and the facility may be operational in 2026 with an anticipated 27 month construction and commissioning 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 is just outside 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, operational and decommissioning stages of the Project, as well as any other impacts associated with the Project.

2.0 Baseline Regional Economic Profile

2.1 Population

The population of the Study Area totalled 55,930 persons as of June 2021 (ABS Estimated Resident Population, 2021), including 25,560 persons located in in the Mid-Western Regional LGA.

Over the period 2022-2036, annual population growth in the Study Area is expected to be +0.4% pa (or +230 persons pa over 14 years) compared to the New South Wales (NSW) growth rate of +1.0% p.a. While this level of growth is comparatively weak, it is noted that Mid-Western Regional Council is projected to experience an average population growth rate (+0.8%) similar to NSW to 2036. However, the Upper Hunter LGA is projected to experience a decline in population over the period, with only minimal growth forecast for Muswellbrook LGA to 2036. This highlights the need for local investment projects which provide new employment opportunities for residents, alternative income streams for local farmers and opportunities for workers transitioning from region's mining sector over the coming decade or so. Major infrastructure investments, such as the proposed Project, can therefore contribute to retaining and potentially expanding population levels within the Study Area.

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 2021.

Table 2.1 Population Projections – Study Area, 2016-2036 (No. of Persons)

Locality	2016	2021	2022	2036	Change 2022 to 2036
Population					
Mid-Western Regional	24,550	25,560	25,730	28,740	3,010
Muswellbrook	16,460	16,210	16,260	17,060	800
Upper Hunter Shire	14,340	14,150	14,100	13,560	-540
Study Area	**55,350**	**55,930**	**56,090**	**59,360**	**3,270**
New South Wales	7,732,860	8,188,650	8,194,570	9,430,100	1,235,530
Average Annual Growth (no.)					
Mid-Western Regional		+200	+170	+210	+220
Muswellbrook		-50	+50	+40	+60
Upper Hunter Shire		-40	-50	-50	-40
Study Area		**+120**	**+160**	**+200**	**+230**
New South Wales		+91,160	+5,920	+94,500	+88,250
Average Annual Growth (%)					
Mid-Western Regional		+0.8%	+0.7%	+0.8%	+0.8%
Muswellbrook		-0.3%	+0.3%	+0.2%	+0.3%
Upper Hunter Shire		-0.3%	-0.4%	-0.3%	-0.3%
Study Area		**+0.2%**	**+0.3%**	**+0.3%**	**+0.4%**
New South Wales		+1.2%	+0.1%	+1.0%	+1.0%

Source: ABS, 3218.0 Regional Population Growth, Australia; Department of Environment and Planning – NSW State and Local Government Population Projections 2022, 2022 NSW Common Planning Assumption Projections
Notes: Figures rounded

2.2 Labour Force

As of March 2022 (latest available), the Study Area had an unemployment rate of 3.1%, which is significantly lower than the rate for NSW (4.6%). The Study Area currently has approximately 890 job seekers who are unemployed. This information is sourced from the Australian Government – *Small Area Labour Markets* data.

The Project is likely to require 350 workers on average over the construction phase (or 500 workers at the Project's construction peak), with potentially 35% of these workers (125-175 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 labour market comprising 28,590 persons (as shown in Table 2.2), the construction phase of the Project may provide some new short-term opportunities for labour force participants directly - although noting only 250 unemployed job seekers are likely to have the appropriate skills based on the Study Area's occupational structure, and these job seekers will be in demand across multiple projects. Other jobseekers may gain new employment through 'back filling' positions vacated by workers transferring from existing roles to take up employment on the Project.

Labour supply factors are further explored in Chapter 3.

Table 2.2 Resident Labour Force Statistics – Study Area, March 2022

LGA/Area	Labour Force	Unemployed	Employed	Unemployment Rate
Mid-Western Regional	13,390	320	13,070	2.4%
Muswellbrook	7,910	390	7,520	4.9%
Upper Hunter Shire	7,290	180	7,110	2.5%
Total Study Area	**28,590**	**890**	**27,700**	**3.1%**
New South Wales	4,308,200	197,200	4,111,000	4.6%

Source: Australian Government Department of Education, Skills and Employment, *Small Area Labour Markets,* March Quarter 2022
Note: Figures rounded.

2.3 Occupational Structure

The latest available employment related census data (ABS Census 2016) shows 45.9% 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). Updated employment related topics from the 2021 ABS Census will be available in late 2022. The skills base of the Study Area is reflected in its occupational structure, as indicated in Table 2.3.

The Study Area's representation in these occupations is well above State average 27.8%, indicating a generally suitable occupational base for the proposed Project is present in the region. In total numbers, approximately 10,360 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	Study Area	New South Wales
Managers	3,100	13.7%	13.6%
Professionals	2,770	12.3%	23.8%
Technicians and Trades Workers	*4,080*	*18.1%*	*12.8%*
Community and Personal Service Workers	2,040	9.0%	10.4%
Clerical and Administrative Workers	2,260	10.0%	14.0%
Sales Workers	1,860	8.3%	9.3%
Machinery Operators and Drivers	*3,240*	*14.4%*	*6.2%*
Labourers	*3,040*	*13.5%*	*8.9%*
Inadequately described	180	0.8%	1.1%
Total	**22,570**	**100.0%**	**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 2021 (latest available) shows the Study Area includes 717 construction businesses or 13.1% of all businesses located in the Study Area. This data, which is shown in Table 2.4, indicates a reasonable presence in the Study Area of the types of firms that are likely to be well-placed to service construction aspects of the Project. This opportunity is explored in more detail in the following Chapter.

Table 2.4 Business Structure – Study Area, 2021

Industry	Non employing	1-19 Employees	20-199 Employees	200+ Employees	Total
Agriculture, Forestry and Fishing	1,577	456	12	3	2,048
Mining	13	19	0	0	32
Manufacturing	81	97	11	0	189
Electricity, Gas, Water and Waste Services	9	0	0	0	9
Construction	*369*	*341*	*7*	*0*	*717*
Wholesale Trade	55	51	3	0	109
Retail Trade	86	160	8	0	254
Accommodation and Food Services	60	191	11	3	265
Transport, Postal and Warehousing	116	96	5	0	217
Information Media and Telecommunications	9	3	0	0	12
Financial and Insurance Services	69	31	3	0	103
Rental, Hiring and Real Estate Services	315	74	0	0	389
Professional, Scientific and Technical Services	182	163	6	0	351
Administrative and Support Services	77	72	16	0	165
Public Administration and Safety	7	6	0	0	13
Education and Training	21	29	3	0	53
Health Care and Social Assistance	87	76	6	0	169
Arts and Recreation Services	44	39	3	0	86
Other Services	109	157	7	0	273
Currently Unknown	8	0	0	0	8
Total	**3,294**	**2,061**	**101**	**6**	**5,462**

Source: ABS, Counts of Australian Businesses, including Entries and Exits, June 2016 to June 2021

2.5 Township Services Capacity

Accommodation

Commercial Accommodation

An audit has been undertaken of commercial and private accommodation located within the Study Area's major townships. These townships generally represent a maximum drivetime of 60-minutes, accessing the main entry points from the Golden Highway and Wollar Road to the Project Site.

These selected townships have a good supply and mix of accommodation including motels, hotels, guest houses, caravan/holiday parks (including cabins). Most accommodation options are located in Mudgee and Scone (refer to Table 2.5), which are within reasonable proximity to the Project Site and provide regional-level services; however, there are also options in smaller townships located closer to the Project Site, including Gulgong, Rylstone, Denman and nearby Merriwa albeit with more limited capacity.

The following commercial accommodation was available in the surrounding townships as of June 2022:

- 790 hotel, motel and serviced apartment rooms
- 116 cabins (caravan/holiday parks)

Table 2.5 Commercial Accommodation in the Study Area, June 2022

Surrounding township	Establishments	Rooms	Cabins	Total
Mudgee	24	471	69	540
Scone	12	127	10	137
Merriwa	2	18	0	18
Gulgong	9	114	12	126
Rylstone	2	27	0	27
Denman	6	33	25	58
Total Study Area	**55**	**790**	**116**	**906**

Source: Ethos Urban; Trip Advisor.

Room Occupancy Rates

While official room occupancy rates are unavailable at a local level, the NSW Government publishes quarterly snapshot data sourced from the STR database (an official Australian Government database). The STR Tourist Accommodation Snapshot for March Quarter 2022 (which covers the main summer holiday period) shows the Central NSW and Hunter Tourism Regions, in which the Study Area is located, had annual room occupancy rates of 60.8% and 63.5% respectively, which is above the NSW occupancy rate of 51.8% for this period.

NSW Tourist Accommodation Snapshot for March 2022 is summarised in Table 2.6.

Table 2.6 NSW Commercial Room Accommodation Occupancy Rates by Tourism Region, March 2022

Tourism Region	Occupancy March Qtr 2022
Sydney	47.0%
Blue Mountains	55.2%
Capital Country	53.5%
Central Coast	61.8%
Central NSW	*60.8%*
Hunter	*63.5%*
New England North West	54.9%
North Coast NSW	64.9%
Riverina	67.2%
Snowy Mountains	54.8%
South Coast	70.1%
The Murray	68.5%

Source: NSW Tourist Accommodation Snapshot March Qtr 2022

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 through Airbnb), or through real estate agents.

As Table 2.7 shows, 13.7% of Study Area dwellings (3,360 dwellings) were unoccupied at the 2021 Census, which is notably higher than the average for NSW (9.4%). Mid-Western Regional LGA had a significant share of unoccupied dwellings (15.0%) or 1,700 dwellings, which is likely related to a large number of holiday homes in this well touristed 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.

Table 2.7 Unoccupied Dwellings – Study Area, 2021

LGA	Occupied Dwellings		Unoccupied Dwellings	
	no.	%	no.	%
Mid-Western	9,640	85.0%	1,700	15.0%
Muswellbrook	6,000	88.1%	810	11.9%
Upper-Hunter	5,500	86.6%	850	13.4%
Total Study Area	**21,140**	**86.3%**	**3,360**	**13.7%**

Source: ABS, Census of Population and Housing, 2021
Note: Figures rounded

High demand for rental properties within the postcodes that broadly reflect a one-hour drive time from the Project Site is evident when observing recent rental vacancy rates. Data sourced from SQM Research for December 2021, reflects a rather constrained rental market in the surrounding region with vacancy rates generally below 1.0%. The highest vacancy rate is in the postcode of 2850 (which includes the Mudgee township) at 1.8% (or 50 vacant dwellings). In total approximately 100 rental properties are vacant in postcodes within a one-hour drive from the Project site.

Large renewable energy projects, such as the proposed Goulburn River Solar Farm, tend to harness the local rental market with the majority of longer-term workers living in shared accommodation (reflecting both convenience and cost). As a result, the local rental markets tend to reach or almost reach full utilisation and may require further supply be brought to the market; this can be achieved through homeowners offering their fully furnished homes/rooms for rent during the construction phase. It is possible this situation might occur during the construction phase of the Project based on the constrained nature of the local rental market and the relatively high share of unoccupied dwellings (including holiday homes) located in the Study Area.

Additionally, data sourced from *www.airdna.co* shows approximately 620 active short-term rentals are currently advertised on Airbnb and Vrbo or have been actively advertised in the past month in the Study Area (June 2022). These active rentals have an average of 2.7 bedrooms per rental. Therefore, in the order of 1,670 rooms could be available in the Study Area through the active short-term rental market.

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, fuel, 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/main townships within the Study Area, and are listed in order of driving distance from the Project Site.

Merriwa

Merriwa, a township of 1,050 persons (ABS ERP 2021) is located centrally in the Upper Hunter Shire LGA and is situated approximately 25km north east of the Project Site. Merriwa generally represents the location of the Project. The township predominantly functions as a service hub for local agricultural activities.

Merriwa has a moderate range of facilities and services, including:

- Hospital – Merriwa Multi-Purpose Service
- A number of commercial accommodation options (2 motels observed and caravan park although no cabins)

- Takeaway food, pub and restaurant options
- Regional Bank
- Home Timber and Hardware
- Various agricultural suppliers
- Post Office
- Two bakeries
- RSL Club
- Golf and bowls Clubs
- Community library
- Emergency services (police, ambulance and fire)
- Medium sized IGA and liquor
- bp Service station
- Pharmacy
- Hairdresser
- Mechanic
- Butcher

Denman

A township of 1,340 persons (ABS ERP 2021), Denman is located in Muswellbrook Shire LGA and is located approximately 60km east of the Project Site. The township contains very limited retail and commercial offerings, with the following services available:

- IGA Plus Liquor
- Hunter Medical (small medical Centre)
- Pharmacy
- Community Centre
- RSL
- Town Hall
- Police station
- Australia Post
- Real estate agencies
- Multiple pubs - Royal Hotel and Denman Hotel
- Caltex service station
- Limited commercial accommodation
- Denman Rural supplies (CRT)
- A number of small takeaway shops
- Local hardware store connected to IGA
- Regional Bank Australia

Mudgee

Mudgee, with a population of 11,830 persons (ABS ERP 2021), is the regional service centre for the Cudgegong River Valley region and Mid-Western Regional Council. The township is located approximately 60km south west from the Project Site (direct line distance) and approximately a 50-minute driving distance. 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, Wilpinjong and Moolarben 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 – Mudgee is serviced by nine educational facilities including five primary schools, one secondary school, two combined schools and one Special 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 operate flights between Mudgee and Cobar, Newcastle, Sydney and Taree.

Rylstone

Rylstone, with a population of approximately 660 persons (ABS ERP 2021), is located 60km to the south of the project Site or a 50-minute drive. Rylstone is a small township located along the Cudgegong River and traditionally known for its history including gold mining and agriculture. Key services in Rylstone include:

- A limited range of commercial accommodation options (see Table 2.5 above)
- Rylstone District Hospital – a moderate sized regional hospital.
- Supermarkets and grocers – a small convenience grocer (Foodworks and liquor), butcher and bakery.
- Entertainment & Dining – various small cafes, Rylstone Club (sports club social and bowls club) and two Hotels
- Fuel Supplies – Enhance and Shell
- Postal Services
- Education – Rylstone Public School
- Rylstone aerodrome

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

Scone

Scone, with a population of 4,820 persons (ABS ERP 2021), is located approximately 75km direct line distance to the north east of the proposed Project Site. Known for its rich history of horse breeding and being one of the world's largest and most lucrative regions. The township is a medium sized service centre primarily supporting the surrounding agricultural activities with a tourism component due the various national parks, reserves and campgrounds in the area. Key services in Scone include:

- Comparatively limited range of commercial accommodation options based the township's size and service role (see Table 2.5 above)
- Multiple medical facilities – a regional hospital (Scott Memorial Hospital) with an emergency department, and Scone medical practice.
- Two full-line supermarkets – Coles and Woolworths
- Recreation, Entertainment & Dining – Scone has a good range of options including the Scone golf club, bowls club, RSL; and a rather limited array of takeaway and restaurant options including cafés, pubs, Chinese and Thai restaurants, and fast food outlets including McDonald's and Dominos
- A limited collection of commercial and financial services, including Commonwealth, Westpac and Regional Bank Australia branches
- Fuel Supplies – Liberty, BP and Caltex
- Postal Services
- Education – two primary schools (Scone Public School, St Mary's Primary school), a government secondary school (Scone High School) and a non-government Combined School (Scone Grammar School)

- Service industry in Scone is rather diverse despite the comparatively small allocation of industrial land. A range of construction (domestic and industrial), manufacturing and civil companies are located in the township. Companies with particular relevance to the Project includes Boral Concrete, Scone Landscape Supplies, Fulljames Engineering, Scone Concrete Industries, PPW Engineering, Farrow Mechanical, Gordon Martin Bulk Haulage and others.

Gulgong

Gulgong, a township of 2,020 persons (ABS ERP 2021) is located in Mid-Western Regional LGA and is situated approximately 100 km south west of the Project Site. Founded as a gold mining settlement, the township today predominantly functions as a service hub for local agricultural activities. Gulgong offers a good mix of facilities and services, including:

- Commercial accommodation – 9 establishments with the largest containing 36 rooms (Ten Dollar Town Motel)
- Gulgong Timber and Hardware and Gulgong Stock and Rural Supplies
- Automotive Mechanics
- Industry – Almac Hardware & Welding Supplies, Ace Engineering etc.
- Supermarket – Supa IGA
- Cafes, bakeries, restaurants and take-away
- Commonwealth Bank branch
- Fuel supplies (Shell and bp)
- Postal Services
- Pharmacy
- Entertainment (parks, hotels, clubs, sports and recreational activities – swimming pool, bowls club etc)
- Gulgong District Hospital – medium sized local hospital
- Education – primary and secondary schools (both public) and a Catholic primary school (All Hallows Primary School).

2.6 Summary

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

1. The population of the Study Area (Local Government Areas (LGAs) of Upper Hunter, Mid-Western and Muswellbrook) totalled 55,930 persons as of June 2021 (ABS Estimated Resident Population 2022 release). Over the period 2022-2036, annual population growth in the Study Area is expected to be +0.4% pa compared to the New South Wales growth rate of 1.0% p.a. The Upper Hunter 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, workers transitioning from the mining sector as well as more diverse income streams for local farmers. These factors may contribute to retaining, and potentially expanding, population levels within this area.

2. National Skills Commission data shows the Study Area had an unemployment rate of 3.1% in December 2021, compared to the NSW rate of 5.0%; with approximately 890 jobseekers unemployed. The Project may provide 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 10,360 workers and 717 businesses in the Study Area involved in construction-related industries.

4. The major regional townships of Mudgee and Scone have the capacity and labour force to service many aspects of the Project, with smaller settlements such as Merriwa, Gulgong, Denman and Rylstone, also likely to provide labour, accommodation and other general services to the Project.

3.0 Economic Impact Assessment

3.1 Project Investment

The total construction cost for the Project is estimated to be approximately $880 million, according to the Project's Capital Investment Value report (WT Partnership, 30 October 2022). Major investment costs are associated with the purchase of PV panels and associated equipment, battery storage components etc, 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% of construction investment is generally retained within the host Study Area for these types of projects. Applying this ratio to total investment indicates approximately $130 million in wages, contracts and other service provision may be generated for the Study Area's economy over 27 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 350 Full Time Equivalent (FTE) jobs will be generated over the construction phase, which is expected to be up to 27 months. That is, on average 350 FTE jobs will be sustained for each of the 27 months of construction activities. However, actual 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 for several months, the Proponent estimates 500 FTE positions will be supported by on-site construction activities.

Based on the Proponent's experience of solar farm construction projects in similar rural locations, the following employment split is considered realistic:

- 35% or 125 FTE jobs sourced from within the Study Area (local employment)
- 65% of 225 FTE jobs sourced from outside the Study Area (non-local employment)

Note, sourcing 35% of the construction workforce locally should be considered a target rather than a commitment by the Proponent, given the low unemployment rate in the Study Area and the significant amount of large energy projects that are being developed in the Study Area and the likely associated cumulative impacts.

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 highlighted 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 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 560 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 includes 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 110 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, where generally 20% share of indirect jobs is applied and noting the significant influx of non-local workers (and their spending) likely to be associated with the Project.

Total Construction Employment

In summary, approximately 910 FTE jobs (350 FTE direct jobs and 560 FTE indirect jobs) are expected to be generated by the Project during the 27-month construction phase.

The amount of direct Study Area employment (i.e., related to on-site construction activities) required for the Project is estimated to be approximately 125 FTE jobs (or 35% of the construction workforce), with a further 110 FTE jobs supported indirectly in the Study Area (i.e., off-site through supply chains and consumption activities).

This number direct and indirect Study Area jobs (215 FTE workers) represents only 2.2% of the Study Area's labour force occupied in construction-related activities (10,360 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 10 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 30 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.

For the purposes of this assessment, it is assumed that 10% of indirect operational jobs are created in the Study Area (refer to previous assumption). This equates to approximately 3 ongoing FTE Study Area positions.

Operational-related employment is for the lifetime of the Project (i.e., 40 years); therefore, while ongoing job creation is relatively small, it represents new long-term employment opportunities at a local, regional and national level.

Total Operational Employment

In summary, approximately 40 FTE jobs (10 FTE direct and 30 FTE indirect) are expected to be generated by the Project, with 13 FTE positions supported in the Study Area.

3.3 Cumulative Effects Assessment

Construction of the Project will potentially need to compete for labour, accommodation, and other resources with major infrastructure projects under construction in the Study Area at the same time. These projects will principally be renewable energy developments driven by investment in the CWO REZ; however, major mining and quarrying projects may also be under construction concurrently. An assessment of cumulative impacts for approved and planned major infrastructure projects located in the Study Area (within a 100 km radius of the Project Site) is summarised in in Table 3.1.

The Assessment Risk ratings are based on the following:

- **Low**: No further consideration of cumulative impacts undertaken.
- **Medium**: Potential for overlap however unlikely to result in substantial cumulative impacts – qualitative assessment of cumulative impacts undertaken.
- **High**: Overlap is certain and there is potential for substantial cumulative impacts – qualitative assessment of the cumulative impacts undertaken.

Table 3.1 Planned and Approved Renewable Energy and Other Major Projects, Study Area

Project	Proximity to Project Site	Capacity	Details / Potential Overlap	Assessment Risk
Approved – construction to commence or underway				
Liverpool Range Wind Farm	55 KM	1,000 MW	Approved but construction timing unknown; currently seeking a modification. Potential overlap with GRSF construction phase	**Medium** Potentially competing for labour and accommodation given the large scale of this project and its relative proximity to the GRSF Project Site.
Stubbo Solar Farm	48 KM	400 MW	Construction commenced in 2022. Assumed no overlap in construction phase.	**Low** Project likely to be completed / largely completed by the time the GRSF project commences.
Wollar Solar Farm	22 KM	290 MW	Construction commenced in July 2022. Assumed no overlap in construction phase	**Low** Project likely to be completed / largely completed by the time the GRSF project commences.
Dunedoo Solar Farm	70 KM	55 MW	Construction is expected to commence late 2022. Assumed no overlap in construction phase	**Low** Project likely to be completed / largely completed by the time the GRSF project commences.
Proposed – under assessment or in planning and design phase				
Birriwa Solar Farm and Battery Project	60 KM	600 MW	Exhibited Oct-Nov 2022. Currently in Response to submissions stage. Possible overlap of construction phase but no anticipated overlap of transport routes.	**Medium** Potentially competing for labour and accommodation given the large scale of this project and its relative proximity to the GRSF Project Site.
Central West Orana Transmission Project	25 KM	N/A	SEARs issued October 2022. Possible overlap with GRSF construction phase.	**Medium**
Valley of the Winds Wind Farm	57 KM	800 MW	Currently in Response to submissions phase. Construction expected to commence in Q1 2024 for 24 to 42 months. Possible overlap for heavy vehicle construction traffic along Golden Highway.	**Medium** Potentially competing for labour and accommodation given the large scale of this project and its relative proximity to the GRSF Project Site.
Barneys Reef Wind Farm	50 KM	350 MW	SEARs issued September 2021. Construction anticipated to	**Medium**

Project	Proximity to Project Site	Capacity	Details / Potential Overlap	Assessment Risk
			commence in Q4 2023 for approximately 28 months. Possible overlap with GRSF construction phase	Potentially competing for labour and accommodation given the relative proximity to the GRSF Project Site and potential for the Barneys Reef and Tallawang projects to be developed concurrently (same proponent)
Tallawang Solar Farm	50 KM	500 MW	Currently responding to submissions. Construction expected to commence in mid-2024 for 34 months. Possible overlap with GRSF construction phase.	**Medium** Potentially competing for labour and accommodation given the relative proximity to the GRSF Project Site and potential for the Barneys Reef and Tallawang projects to be developed concurrently (same proponent)
Spicers Creek Wind Farm	80 KM	720 MW	SEARs issued May 2022. No information available on anticipated construction timing. Possible overlap with the GRSF construction phase.	**Medium** Potentially competing for labour and accommodation given the large scale of this project and its relative proximity to the GRSF Project Site.
Merriwa Solar Farm	30 KM	550 MW	SEARs issued January 2022. No information available on anticipated construction timing. Possible overlap for heavy vehicle construction traffic along Golden Highway.	**Medium** Potentially competing for labour and accommodation given the large scale of this project and its relative proximity to the GRSF Project Site.
Bowmans Creek Wind Farm	96 KM	336 MW	In assessment phase. Possible overlap with GRSF construction phase	**Medium** Potentially competing for labour and accommodation given the large scale of this project and its relative proximity to the GRSF Project Site.
Hills of Gold Wind Farm	101 KM	420 MW	In assessment phase. Possible overlap GRSF construction phase	**Medium** Potentially competing for labour and accommodation given the large scale of this project and its relative proximity to the GRSF Project Site.
Bellambi Heights Renewables Project	54 KM	200 MW	SEARs issued May 2022. Possible overlap with GRSF construction phase.	**Medium** Potentially competing for labour and accommodation given the large scale of this project and its relative proximity to the GRSF Project Site.
Ulan Solar Farm	38 KM	50 MW	SEARs issued September 2022. Possible overlap of with GRSF construction phase	**Medium** Potentially competing for labour and accommodation given the large scale of this project and its relative proximity to the GRSF Project Site.
Sandy Creek Solar Farm	83 KM	840 MW	SEARs issued May 2022. Possible overlap with GRSF construction phase.	**Low/Medium** Potentially competing for labour and accommodation given the large scale of this project and its relative proximity to the GRSF Project Site. However, Lightsource bp (the proponent) has some control over timing schedule and coordination of resources across both projects.
Cobbora Solar Farm	82 KM	700 MW	SEARs issued November 2022. Possible overlap with GRSF construction phase.	**Medium** Potentially competing for labour and accommodation given the large scale of this project and its relative proximity to the GRSF Project Site.
Bowdens Silver Project	45 KM	N/A	In recommendation phase. No information available on anticipated construction timing. Possible overlap for heavy vehicle traffic along Golden Highway.	**Low** Workforce is likely to be predominately local with existing/previous extraction experience. Unlikely to put pressure on construction labour and accommodation resources.

Source: NSW Planning Portal; Goulburn River Solar Farm Scoping Report, Umwelt (December 2021)

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

- The development status of projects varies (as shown in Table 3.1), 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 Assessment highlights that competition for labour and accommodation are the primary cumulative impacts of relevance from an economic perspective. It is understood that concerns about workers accommodation and potential impacts on housing availability was a key theme from community feedback in stakeholder consultations.

Subject to the implementation of appropriate management and planning initiatives, impacts associated with the Project can be reduced and/or minimised (refer to Section 3.12 Proposed Mitigation Measures).

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 (10,360 workers) and construction-related businesses (720 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 890 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.

In order to maximise local content, the Proponent will provide a database to the selected EPC which will include details of workers/companies who have registered an interest in providing employment and services to the Project. This will allow the EPC to target tenders to local contractors and approach local workers with employment opportunities which match their skills set.

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 section 3.11 – 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 325 non-local FTE workers 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 65% of the 500 peak on-site FTE 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 several months. The average number of non-local staff requiring accommodation across the 27 months is estimated at 225 FTE 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 910 rooms and cabins in commercial accommodation in locations within a 60-minute drive of the Project Area. Assuming each non-local worker requires individual accommodation (325 rooms), 36% 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 long and short-term rentals (e.g., vacant houses, holiday homes, Airbnb properties) 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 620 private short-term rentals on the market in the Study Area, potentially yielding 1,670 rooms and 100 rental homes (depending on occupancy rates at the time of construction); while an additional 3,360 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 reasonable capacity currently exists in the Study Area to accommodate the number of non-local workers expected at the peak of the Project; increased demand from concurrent regional infrastructure projects (refer to section 3.1) and seasonal accommodation demands (tourism, agricultural and mining activities etc) also need to be factored in.

With regard to the above factors, the Proponent should consider developing a construction workforce strategy/plan (refer to 3.11 – Proposed Mitigation Measures) in consultation with other generators, other major development and the CWO REZ Transmission Line (TL) projects. This would be undertaken 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 other key industry sectors (e.g., tourism, agriculture, mining).

3.6 Local Wage Spending Stimulus

Construction employment targets outlined earlier in this report indicate that 65% of the 350 direct FTE construction jobs (225 FTE workers) may need to be sourced from outside the Study Area, particularly specialist and management positions.

This level of employment would equate to $53.5 million in wages (2022 dollars) on the basis that each non-local worker is employed for 27 months and earns the average construction wage of $97,000 pa (source: ABS, *Average Weekly Earnings 6302.0 - Full Time Adult Ordinary Time Earnings*, November 2021).

A considerable portion of these wages would be spent in the Study Area, where these workers will be based. An estimated $30.1 million in wages (2022 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 150 FTE jobs in the services sector and associated supply chains (based on 1 FTE job allocated for every $200,000 of induced spending), supporting jobs in the Study Area and beyond such as in retail, accommodation, trade supplies, health services, fuel 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 2,000 ha of existing agricultural land will be required to host the Project, which includes a development footprint of 799799.5 ha. This land is mainly used for agricultural grazing.

No loss of employment associated with the Subject Site is anticipated, either directly (on-site) or through the supply chain, as 1,000 head of sheep will be grazed in and around the solar farm structure. The new mixed-use arrangement is likely to require a similar number of employees as the present setup (i.e., 1.0 FTE to 1.25 FTE).

3.8 Ongoing Economic Stimulus

Financial Returns to Landowners

The Proponent has an option to purchase the 44 titles that comprise the 2,000 ha Project Site, providing a financial stimulus to these landowners which may provide a local stimulus through investment in other farming (or other) activities and through business and individual consumption impacts.

Financial Returns to the Community

The Proponent has indicated it will provide community payments for the operating life of the Project (40 years). These payments will be linked to CPI and may take the form of a Community Fund which will provide grants to local organisations/programs under a formal management arrangement (e.g. Voluntary Planning Agreement between the Project operator and Council).

Additionally, the Proponent will make a one-off construction and transition payment to the community during the Project's construction phase (details yet to be finalised).

Financial Returns to Council

Change in land use to facilitate the development of the Project has potential to result in an increase in annual land tax payments to Council from the site (compared with existing land 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 (2022 dollars). Note, this figure should be considered a high level estimate only. Note, this figure relates to land taxes only and does not include any new/improved infrastructure delivered by the Project.

Local Operational Wage Stimulus

The Project will support 13 FTE jobs in the Study Area (direct and indirect). These 13 FTE jobs will provide an estimated stimulus within the Study Area of approximately $660,000 (2022 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 $120 million over 40 years, (2022 dollars, CPI adjusted) relating to operational wage stimulus, Community Shared Benefit Strategy payments and net land tax revenue to Council.

3.9 National Grid Supply Benefits

With an installed capacity of 550 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.

To provide context and theoretical perspective on the scale of the anticipated output from the solar farm, the Study Area currently contains approximately 24,500 dwellings (ABS Census 2021); therefore, the Project has the potential to provide over ten times the annual electricity requirements of the Study Area, highlighting the importance of the facility from a clean electrical generation perspective.

The Project will provide renewable energy contributing to the reduction of greenhouse gases across NSW, avoiding up to 705,000 tonnes p.a.

3.10 Tourism Opportunities

Over time, the Project may provide opportunities to attract new visitors to the area to view the facility.

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. Visitors might include environmentalists, school and further education students, general tourists etc.

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, Merriwa and Mudgee.

3.11 Summary of State Benefits

In addition to supporting NSW State policy directions (refer to section 1.3) and national grid supply benefits (refer to section 3.9), the Project will deliver the following key Statewide economic benefits:

- Capital investment: $350 million or 40% of total project capital investment (recognising the large import component associated with solar farms)
- Construction employment: 820 FTE jobs or 90% of total construction employment
- Ongoing employment: 36 FTE jobs, or 90% of total operating employment
- Supports ongoing industry transition in Regional NSW from agriculture, mining etc to renewable energy.
- Future decommissioning investment and employment opportunities, to be determined (refer to 3.13).

3.12 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 Shared Benefit Strategy

In order to ensure the broader community benefit from the construction and operation of the Project, it is recommended the Proponent develop a Community Shared Benefit Strategy (CSBS) which will include annual grants to local community organisations and specific programs. Guidelines and management structures for the operation of a Community Fund would need to be put in place; however, there is potential for this to be governed through a Voluntary Planning Agreement with Council. It is understood that the Proponent is in the process of negotiating a Voluntary Planning Agreement with Upper Hunter Shire Council which will cover the large majority of the funds for community benefit.

3.13 Project Decommissioning

The Project has an operating life of approximately 40 years, at which stage there are likely to be three main options for consideration:

- Continue to use the Project Site as a solar farm using the existing infrastructure, potentially with some refurbishments
- Replace/modernise all project infrastructure and continue to operate as a new/significantly upgraded solar farm
- Decommission the Project and rehabilitating the Project Site so the land can be returned to agricultural use.

Noting the Proponent has outright ownership of the Project Site, the decision on whether to refurbish, replace or decommission the solar farm would be subject to an assessment of the economic viability closer to the time, and in consultation with key stakeholders and approval authorities.

If decommissioning were to occur, these activities pose similar potential impacts and benefits as construction activities, albeit over a shorter timescale. Decommissioning activities would involve a significant on-site workforce to dismantle the infrastructure and other workers to transport project components from the site for disposal or recycling. The site then would require a range of resources to undertake rehabilitation activities.

Decommissioning would therefore support significant employment, business contracts and provide a spending stimulus to the Study Area over the decommissioning period.

Given decommissioning will not occur for at least 40 years after the operation of the Project commences, it is not possible to estimate potential impacts and benefits at this stage noting economic, technological and environmental factors may change considerably over this period. Note however, the Proponent is committed to ensure as much infrastructure as possible is recycled on decommissioning.

4.0 EIA Conclusions

1. The Project will require approximately $880 million in investment during the construction phase (of which approximately $130 million will be retained in the Study Area) and will support 350 direct and 560 indirect Full Time Equivalent (FTE) positions in the national economy over the 27-month construction period. Once operational, 10 direct and 30 indirect FTE jobs will be supported nationally by the Project.

2. Of this national total, the Study Area is expected to benefit from 235 FTE construction jobs and 13 FTE ongoing jobs (includes direct and indirect jobs) associated with the Project.

3. The Study Area has moderate capacity in terms of construction-related workers (10,360 workers) and businesses (720 businesses) to manage the requirements of the Project, and concurrent regional infrastructure projects if required.

4. The Project will provide new participation opportunities for businesses and workers located in the Study Area, having regard for the good match of skills and resources available.

5. The 'external' Project labour requirement would be expected to generate an accommodation need for 325 FTE workers at the peak of the Project. This represents 36% of total commercial accommodation rooms/cabins within a 60-minute drive of the Project Site. However, further capacity available in caravan parks (powered sites), private rentals (e.g., long-term houses/units, short-term 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 commercial accommodation providers over the construction phase (especially in off-peak seasons) including in small townships such as Rylstone, Gulgong and Merriwa, and also private property owners.

6. Construction workers relocating to the region would be expected to inject approximately $30.1 million in new spending into the economy over the construction phase, supporting approximately 150 FTE jobs in the service sector in the Study Area over this time.

7. Cumulative impacts are associated with significant development of major renewable energy projects in the CWO REZ in the coming years 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.

8. Approximately 2,000 ha of existing agricultural land will be required to host the Project, with a development footprint of approximately 799.55 ha. This land, which the Proponent has an option to purchase from the existing landowners, is mainly used for grazing. No loss of employment associated with the Project Site is anticipated, either directly (on-site) or through supply chains, as the Project has been designed to be compatible with sheep grazing and cattle grazing will continue in some locations outside the development boundary but within the project boundary, where compatible with areas proposed for use as biodiversity offset.

9. Ongoing economic stimulus associated with the operation of the Project is estimated at approximately $120 million (over 40 years, CPI adjusted) relating to, operational wage stimulus, Community Benefits Fund and net land tax revenue to Council.

10. The Project has the capacity to supply sufficient renewable 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).

11. 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 nearby CWO REZ over the coming years.

12. In addition to supporting NSW State policy directions and national grid supply benefits the Project will deliver the following key Statewide economic benefits:

- Capital investment: $350 million or 40% of total project capital investment

- Construction employment: 820 FTE jobs or 90% of total construction employment
- Ongoing employment: 36 FTE jobs, or 90% of total operating employment
- Supports ongoing industry transition in Regional NSW from agriculture, mining etc to renewable energy
- Future decommissioning investment and employment opportunities (to be determined).

13. In order to minimise potential Project impacts and maximise Project benefits, the following 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 a Community Shared Benefit Strategy (CSBS), which could include funds to be administered through a Voluntary Planning Agreement with Council.

14. Decommissioning of the Project is likely to support significant employment generation, new business contracts and provide a spending stimulus to the Study Area over the decommissioning period. However, given decommissioning will not occur for at least 40 years after the operation of the Project commences, it is not possible to estimate potential impacts and benefits at this stage noting economic, technological and environmental factors may change considerably over this period.