

APPENDIX I ECONOMIC IMPACT ASSESSMENT



Currawarra Solar Farm Project

Economic Impact Assessment

FINAL

Prepared for

RES Australia

by

Essential Economics Pty Ltd

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EXECUTIVE SUMMARY

RES Australia Pty Ltd (RES) have commissioned Essential Economics Pty Ltd to prepare an Economic Impact Assessment for the proposed 195 Mega Watt (MW) Currawarra Solar Farm development to be located 25km north-east of Deniliquin at Mayrung, New South Wales.

The solar farm will be located across a 750ha property and, subject to planning approval and financing; the facility is expected to be operational by mid-2020.

The main findings of this study are summarised as follows.

Regional Economic Context

- 1 The Study Area has a resident population of around 95,000 persons (2016), which is expected to reach approximately 99,000 persons by 2031 representing a modest annual growth rate of 0.3% over the period. Importantly, population decline is forecast for the Edward River Shire and adjoining Berrigan Shire (-1,250 persons) over the 2016-31 period; therefore, major projects which stimulate new investment and jobs should be encouraged in terms of supporting the regional economy.
- 2 The Study Area currently has an unemployment rate of 5.1%, which is same as the NSW unemployment rate and below the Victorian unemployment rate of 5.8%. However, unemployment in Edward River Shire is relatively high (5.9%) and the Study Area currently includes 2,300 persons who are unemployed. In this regard construction of the Currawarra Solar Farm project provides new short-term employment opportunities for the region's labour force participants, with a small amount of ongoing employment also supported once the facility is operational (refer to section 3.2, following).
- 3 The Study Area's occupational, industry and business structures indicate a good base exists to service the needs of the solar farm project, including approximately 14,400 construction-related workers (based on occupation) and 2,000 construction and transport businesses.
- 4 Deniliquin, given its close proximity to the subject site, will underpin most project needs in view of its supply of commercial accommodation (200 rooms), trade supplies and transport services, machinery hire and repairs, retail services, hospital and so on. However, the major regional city of Echuca (just over an hour from the subject site) is also likely to be important for the project in terms of labour supply, construction and trade services, transport and logistics and higher-order medical and emergency services.

Economic Impact Assessment

- 5 The Currawarra Solar Farm project will involve approximately \$250 million in investment during the construction phase and will support 200 direct and 320 indirect positions over the construction period. Once operational, 4 direct and 12 indirect jobs will be supported by the facility.

- 6 Allowing for the project to be carefully managed around the region's peak times for harvesting activity and the scheduling of the Echuca-Moama Bridge project, accessing adequate labour supply should not present a major issue for the project, noting the peak local employment requirement for the project represents just over 1% of workers occupied in construction-related activities in the Study Area.
- 7 Concurrent infrastructure projects in the Study Area – including the Deniliquin Ethanol Plant, the Echuca-Moama Bridge project, and Edward River Major Projects Program – are unlikely to impact on labour and resources required to support the solar farm project, for the following reasons :
 - The Currawarra Solar Farm project requires a relatively small amount of labour (200 jobs), with some of these positions sourced from outside the Study Area
 - Different construction time frames/ staging associated with competing projects
 - The large construction-base available in the Study Region (ie 14,400 construction-related workers and 2,000 construction-related businesses) which can support a pipeline of infrastructure projects.
- 8 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. In this regard, the proponent and organisations such as the Industry Capability Network might be involved in ensuring maximum local inputs are secured.
- 9 The 'external' project labour requirement would be expected to generate an accommodation need for 60 project workers at the peak of the project. This represents only 4% of total commercial accommodation rooms in the Study Area and would provide a boost to local accommodation operators, noting that room occupancy rates of less than 50% were recorded during the peak tourism period (March Quarter, 2016) in the Study Area with occupancy rates closer to 40% in the Deniliquin Region over this period.
- 10 Construction workers would be expected to inject approximately \$2.7 million in additional spending into the regional economy over the construction phase, supporting around 13.5 jobs in the service sector in Deniliquin and the broader Study Area.
- 11 Approximately 620ha of productive agricultural land (cropping) will be lost to accommodate the solar farm. However, this represents just 0.1% of all productive cropping land supply in the NSW Murray Region. Importantly, the host landowner will improve their annual income, as operator payments will be greater than average farm income from the land and the land can be returned to cropping at the end of the solar farms lifecycle.
- 12 Ongoing economic stimulus associated with new local wage spending and returns to the host landowner is estimated at \$35.9 million over 25 years (adjusted for CPI).
- 13 Council rates revenue associated with the solar farm will be subject to negotiations between Edward River Council and the proponent; however, financial benefits to Council are likely to be significant over the 25-year project lifecycle.

- 14 The proposed Community Fund would contribute a further \$1.7 million (adjusted for CPI) over the 25-year period and this can be directed to new community infrastructure and programs.
- 15 The project has the capacity to supply sufficient clean energy to power approximately 78,000 homes and, in the process, to reduce CO² emissions by 155,000 tonnes per year.
- 16 Once operational, the Currawarra Solar Farm and the nearby Tarleigh Park Solar Farm will present a unique environmental experience for the region, which could potentially support small-scale tourism and educational opportunities in the future.

INTRODUCTION

Background

RES Australia Pty Ltd (RES) have commissioned Essential Economics Pty Ltd to prepare an Economic Impact Assessment for the proposed Currawarra Solar Farm development to be located 25km north-east of Deniliquin at Mayrung, New South Wales.

The proposed development will be situated on a 750ha site which involves a single landholding. The solar farm will have a capacity of 195 MW powered by up to 670,000 photovoltaics panels. Subject to planning approval and financing, construction of the Currawarra Solar Farm is anticipated to start in late 2018 with the facility fully operational by mid-2020.

RES is also in the process of planning for the development of the 90 MW Tarleigh Park Solar Farm which will be located at Blighty, approximately 16km south of the Currawarra Solar Farm site with the two projects expected to be constructed concurrently (subject to planning approval and financing).

Objectives

The objectives of this project are:

- To highlight likely local and regional economic benefits arising from the project
- To identify potential impacts associated with the project.

This Report

This report contains the following chapters:

- Chapter 1: **Project Context**
Presents a description of site location, project components, policy context and definition of Study Area.
- Chapter 2: **Regional Economic Profile**
Presents an overview of population and demography, labour force, occupational structure, industry structure, business structure and township services, including an audit of available commercial accommodation in Deniliquin and the Study Area..
- Chapter 3: **Economic Impact Assessment of Proposed Project**
Presents an assessment of the economic impacts of the proposed development including investment, employment, business participation, local wage stimulus, impact on accommodation, impact on agricultural activities, local economic stimulus, financial returns to Council and the community and environmental benefits.

1 PROJECT CONTEXT

1.1 Site Location

The proposed Currawarra Solar Farm will be developed on a site in Mayrung located approximately 25km north-east of the regional city of Deniliquin, in the Riverina area of NSW.

The Currawarra site is within a 20 minute drive from Deniliquin, and just over an hour from the major townships of Moama and Echuca to the south, which can be considered reasonable driving distances with regard to sourcing workers or providing accommodation and other services to the project.

The site is approximately 750ha in area and is currently used for farming purposes (cropping) under the Farming Zone (FZ). It is estimated the majority of the site (approximately 80%) will be utilised for solar farm infrastructure.

An existing 132kV transmission line runs along the southern and eastern boundaries of the site. The on-site connection to the 132kV TransGrid overhead line will involve an on-site substation with a 33kV-132kV transformer allowing for efficient connection to the National Grid.

The solar farm site is located in the Edward River Council; this Council was formed in 2016 from the merger of the Deniliquin Council with the surrounding Conargo Shire. The Currawarra Solar Farm is classed as a State Significant project and will require approval by the NSW Department of Planning and Environment.

1.2 Project Description

The project will consist of a Solar Photovoltaics (PV) facility of up to 195MW AC arranged as either a series of fixed or tracker arrays.

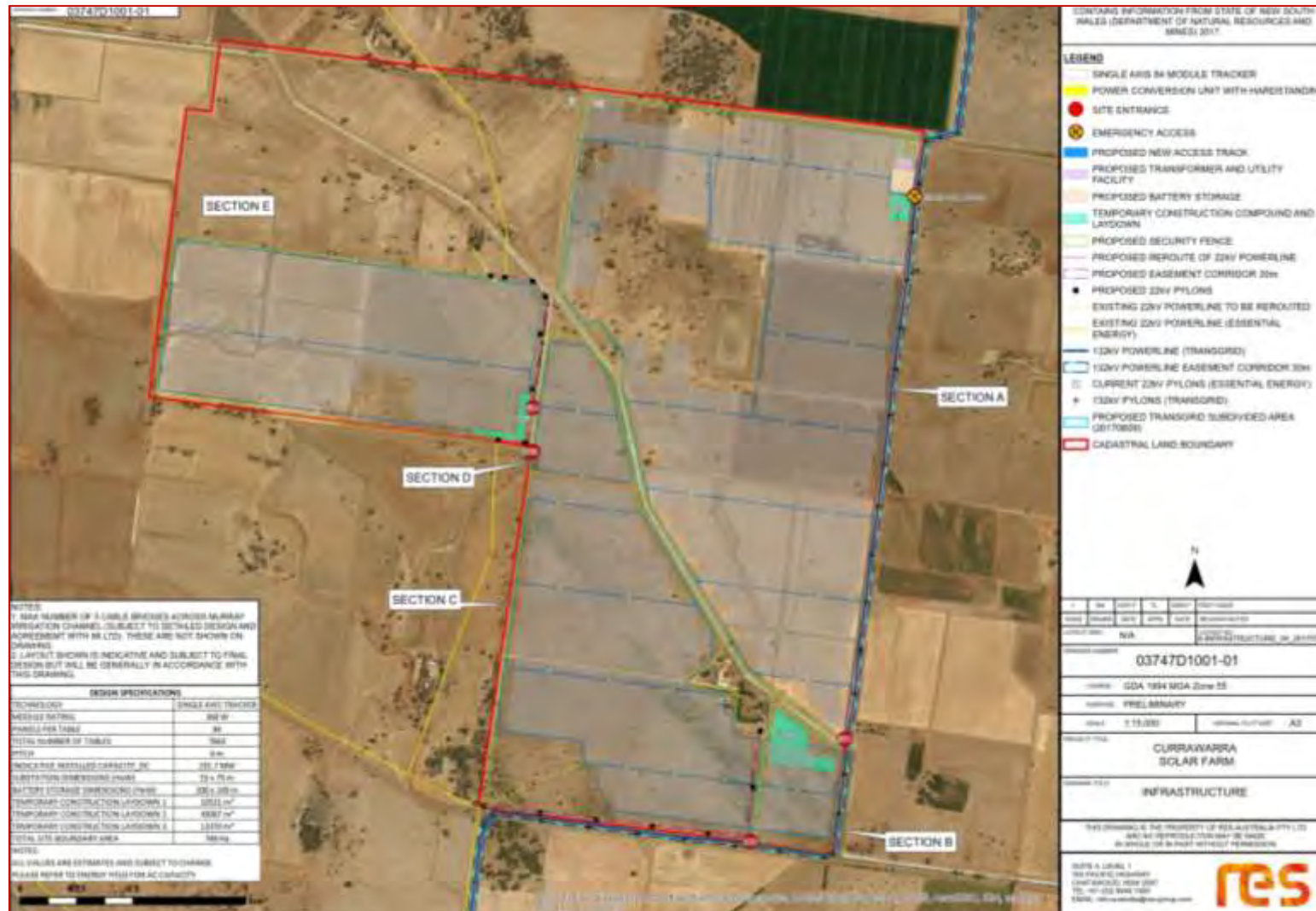
The arrays consist of approximately 667,000 1mx2mx0.05m PV panels mounted on steel or aluminum racking. The PV modules for a fixed array are arranged to face north; however, for a tracker array, the modules are arranged north to south, with the panels tilting around a centre rail to follow the sun's trajectory throughout the day.

A number of 4m wide graded tracks across the site will allow all-weather access for construction and operational maintenance. An operations and maintenance building with associated carparking will be constructed to service the solar farm.

The solar farm will be connected to the National Grid through an on-site connection into an existing 132kV TransGrid overhead line. This will involve an on-site substation with a 33kV-132kV transformer. The existing 132kV line runs along the southern and eastern boundaries of the site.

The Currawarra Solar Facility location is outlined in Figure 1.1 and the preliminary site layout is shown in Figure 1.2.

Figure 1.2: Currawarra Solar Farm – Preliminary Site Layout



Source: RES Australia

1.3 Policy Context

Federal and State policy are important factors in influencing demand and investment in the renewable energy sector, as noted below.

The Renewable Energy Target is an Australian Government scheme designed to reduce emissions of greenhouse gases in the electricity sector and encourage the additional generation of electricity from sustainable and renewable sources.

The Renewable Energy Target (RET) works by allowing both large-scale power stations and the owners of small-scale systems to create certificates for every megawatt hour of power they generate. Certificates are then purchased by electricity retailers who sell the electricity to householders and businesses. These electricity retailers also have legal obligations under the RET to surrender certificates to the Clean Energy Regulator, in percentages set by regulation each year. This creates a market which provides financial incentives to both large-scale renewable energy power stations and the owners of small-scale renewable energy systems.

In June 2015, the Australian Parliament passed the Renewable Energy (Electricity) Amendment Bill 2015. As part of the amendment bill, the large-scale RET was reduced from 41,000 GWh to 33,000 GWh in 2020, with interim and post-2020 targets adjusted accordingly.

The NSW Renewable Energy Action Plan (2013) provides a framework to enable the State to meet the RET target, through a range of 24 actions associated with:

- Attracting investment and projects
- Building community support
- Attracting and growing expertise in renewable energy technology.

While the NSW Government does not mandate a specific renewable energy target for the State (unlike Victoria which recently set a 40% renewable energy target for the State by 2025), it does have an aspirational target of zero emissions by 2050.

The NSW Renewable Energy Action Plan Annual Report monitors implementation of the Plan and reports on progress to meeting the 2020 RET target. The 2016 Annual Report notes that 17 of the 24 actions have been implemented, with the further seven substantially progressed and notes the percentage of renewable energy in the state's electricity mix has more than doubled over the past six years, underpinned by large scale solar projects.

1.4 Study Area

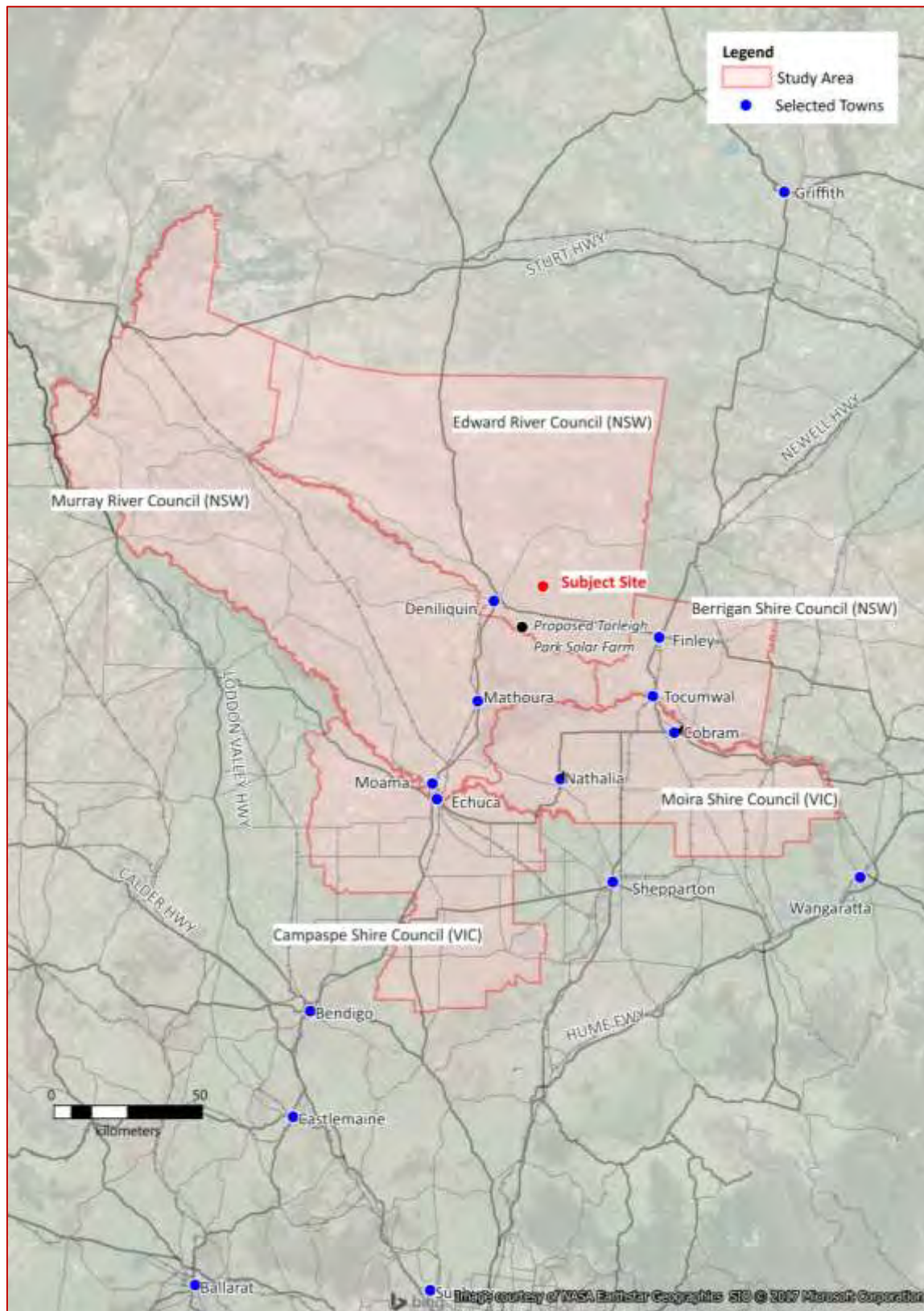
The Study Area for the project has been defined as the Local Government Areas (LGAs) of:

- Berrigan Shire Council (NSW)
- Edward River Council (NSW)
- Murray River Council (NSW)
- Campaspe Shire Council (VIC)
- Moira Shire Council (VIC)

These LGAs, to differing extents, all have the potential to contribute to the project and derive economic benefits from both the construction and ongoing phases of the project.

This Study Area is illustrated in Figure 1.3.

Figure 1.3: Currawarra Solar Farm – Study Area



Source: Essential Economics

1.5 Summary

- 1 RES Australia is proposing the construction of a 195 MW Solar Farm in Currawarra, approximately 25km to the north-east of Deniliquin, NSW.
- 2 The solar farm facility will be located across a single property which is 750ha in size.
- 3 Subject to planning approval by the NSW Department of Planning and Environment, it is anticipated construction of the solar farm could start by late 2018, and the facility may be operational by mid-2020.
- 4 The Australian Government's reformed Renewable Energy Target (RET) was legislated in June 2015 and this has provided greater investment certainty within the sector, including for investments in solar power developments of the type proposed for Currawarra. The NSW Government supports the federal RET target and the NSW Renewable Energy Action Plan provides a framework to stimulate investment in the sector.
- 5 This economic impact study 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 Currawarra Solar Farm project.

2 REGIONAL ECONOMIC PROFILE

2.1 Population and Demography

The population of the Study Area totalled approximately 95,170 persons as of June 2016 (ABS Estimated Resident Population).

Over the period 2016-2031 population growth in the Study Area is expected to be very modest at just +0.3% pa (or +5,270 persons over 15 years), as shown in Table 2.1. These estimates are based on official population forecasts prepared by the NSW and Victorian governments.

Of particular note is the projected population contraction in the Edward River Council area of -970 persons over the period representing a decline in population of -0.8% pa over 15 years, with neighbouring Berrigan Shire also forecast to experience population decline over the period of -400 persons (or -0.3% pa).

These population projections for Edward River and Berrigan LGAs highlight economic trends experienced in many rural areas over recent years, especially those with a high reliance on the agricultural sector and which have been negatively impacted variously by drought, an uncompetitive exchange rate, and an ageing labour force.

In this context the proposed Currawarra Solar Farm will provide an alternative drought-proofed, guaranteed income to the host farm for 25 years; while the construction and operational phases of the project will provide an economic stimulus (jobs, project contracts, new spending etc) to the Deniliquin economy and other small towns and rural settlements in the nearby region.

Table 2.1: Population – Study Area, 2016-2031

Municipality	2016	2031	Change 2016-31	AAGR 2016-31
Berrigan Shire Council (NSW) ¹	8,400	8,000	-400	-0.3%
Edward River Council (NSW) ¹	8,650	7,800	-850	-0.7%
Murray River Council (NSW) ¹	11,550	12,300	+750	+0.4%
Campaspe Shire Council (VIC) ²	37,060	38,790	+1,730	+0.3%
Moir Shire Council (VIC) ²	29,110	32,040	+2,930	0.6%
Study Area	94,770	98,930	+4,160	+0.3%

Source: ¹ 2016 New South Wales State and Local Government Area Population Projections, NSW Department of Planning & Environment; ² Department of Environment, Land, Water and Planning, Victoria in Future 2016;

Notes: AAGR = Annual Average Growth Rate
Figures rounded

2.2 Labour Force

As of March 2017 (latest available) the Study Area had an unemployment rate of 5.1%, which is the same as the NSW unemployment rate and slightly below the Victorian unemployment rate of 5.8%.

However, unemployment in Edward River Shire, in which the project is to be located, is relatively high (5.9%) in the context of the Study Area overall and with respect to state averages. As Table 2.2 shows, in March 2017 the Study Area's labour force totalled 45,000 persons, including 2,300 persons who were unemployed.

The Currawarra Solar Farm project is likely to require 200 workers (at peak), with some of these workers being sourced from outside the Study Area (eg management, specialists). In the context of the relatively large labour market and the number of job seekers currently unemployed, the Currawarra Solar Farm project is unlikely to cause labour supply issues, rather provide new short-term opportunities for labour force participants (including existing unemployed persons – subject to appropriate skills match).

It is recognised; however, that the Study Area is underpinned by the agricultural sector and that significant labour resources are required on a seasonal basis for harvesting and related activities. Additionally, a number of major infrastructure projects will potentially be developed at the same time as the construction of the Currawarra Solar Farm and implications will also need to be considered in terms of regional labour supply.

These labour supply factors are further explored in Chapter 3.

Table 2.2: Labour Force – Study Area, March 2017

Municipality / Area	Employed	Unemployed	Total Labour Force	Unemployment Rate
Berrigan Shire Council (NSW)	3,130	125	3,250	3.8%
Edward River Council (NSW)	3,320	210	3,530	5.9%
Murray River Council (NSW)	4,520	145	4,670	3.1%
Campaspe Shire Council (VIC)	18,210	1,030	19,240	5.4%
Moira Shire Council (VIC)	13,520	790	14,310	5.5%
Study Area	42,700	2,300	45,000	5.1%
New South Wales	3,805,100	203,700	4,008,800	5.1%
Victoria	3,069,000	190,200	3,259,200	5.8%

Source: Australian Government Department of Employment, *Small Area Labour Markets – March Quarter 2017*

Figures rounded

2.3 Occupational Structure

The skills base of the Study Area is reflected in its occupational structure, as shown in Table 2.3. ABS Census data for 2011 (latest available) shows 36% of Study Area workers were occupied in activities generally associated with the types of skills required for the construction

of a solar farm (ie technicians and trades workers, machinery operators & drivers, and labourers).

The Study Area's representation in these occupations is well above the State averages of 28% and 29% for NSW and Victoria respectively, indicating a generally suitable occupational base for the proposed project.

In total numbers, approximately 14,420 workers in the Study Area are occupied in construction-related activities highlighting the strong worker base available to support the project.

Table 2.3: Occupational Structure – Study Area, 2011

Occupation	Berrigan Shire Council (NSW)		Edward River Council (NSW)		Murray Shire Council (NSW)		Campaspe Shire Council (VIC)		Moirra Shire Council (VIC)		Study Area		NSW	VICTORIA
	No.	Share	No.	Share	No.	Share	No.	Share	No.	Share	No.	Share	Share	Share
Professionals	415	12.2%	532	13.8%	594	12.4%	2,090	13.1%	1,328	11.4%	4,959	12.5%	22.7%	13.0%
Managers	716	21.0%	783	20.4%	1,297	27.0%	2,950	18.5%	2,401	20.6%	8,147	20.5%	13.3%	22.0%
Technicians and Trades Workers	474	13.9%	525	13.7%	615	12.8%	2,341	14.7%	1,658	14.2%	5,613	14.1%	13.2%	13.7%
Community and Personal Service Workers	370	10.8%	402	10.5%	432	9.0%	1,529	9.6%	1,085	9.3%	3,818	9.6%	9.5%	9.1%
Clerical and Administrative Workers	325	9.5%	476	12.4%	479	10.0%	1,675	10.5%	1,118	9.6%	4,073	10.3%	15.1%	14.2%
Sales Workers	269	7.9%	350	9.1%	394	8.2%	1,487	9.3%	1,012	8.7%	3,512	8.9%	9.3%	9.6%
Machinery Operators and Drivers	324	9.5%	284	7.4%	337	7.0%	1,217	7.6%	855	7.3%	3,017	7.6%	6.4%	6.0%
Labourers	470	13.8%	429	11.2%	578	12.0%	2,355	14.8%	1,955	16.8%	5,787	14.6%	8.7%	8.9%
Not stated	30	0.9%	31	0.8%	56	1.2%	144	0.9%	130	1.1%	391	1.0%	0.8%	2.2%
Inadequately described	20	0.6%	33	0.9%	25	0.5%	163	1.0%	114	1.0%	355	0.9%	1.0%	1.4%
Total	3,413	100.0%	3,845	100.0%	4,807	100.0%	15,951	100.0%	11,656	100.0%	39,672	100.0%	100.0%	100.0%

Source: ABS Census of Population and Housing 2011

2.4 Industry Structure

ABS Industry structure data for 2011 (latest available) shows the Study Area has 3,000 workers directly employed in the construction sector and a further 1,610 workers employed in transport, postal and warehousing sector.

In total, these two sectors employ 4,610 workers or approximately 12% of the labour force. As with the occupational structure, this industry structure indicates the Study Area provides a good labour force base to service the Currawarra Solar Farm project.

Industry Structure data is shown in Table 2.4.

Table 2.4: Industry Structure – Study Area, 2011

Industry Sector	Berrigan Shire Council (NSW)		Edward River Council (NSW)		Murray Shire Council (NSW)		Campaspe Shire Council (VIC)		Moirra Shire Council (VIC)		Study Area		NSW	VICTORIA
	No.	Share	No.	Share	No.	Share	No.	Share	No.	Share	No.	Share	Share	Share
Agriculture, Forestry and Fishing	646	18.9%	700	18.1%	1,000	20.8%	2,057	12.9%	1,929	16.5%	6,332	15.9%	2.2%	2.3%
Mining	3	0.1%	11	0.3%	16	0.3%	74	0.5%	29	0.2%	133	0.3%	1.0%	0.4%
Manufacturing	290	8.5%	269	7.0%	390	8.1%	2,312	14.5%	1,724	14.8%	4,985	12.6%	8.4%	10.7%
Electricity, Gas, Water and Waste Services	56	1.6%	103	2.7%	60	1.2%	204	1.3%	107	0.9%	530	1.3%	1.1%	1.1%
Construction	229	6.7%	254	6.6%	344	7.2%	1,268	8.0%	907	7.8%	3,002	7.6%	7.3%	8.3%
Wholesale Trade	87	2.5%	106	2.7%	157	3.3%	434	2.7%	382	3.3%	1,166	2.9%	4.4%	4.5%
Retail Trade	348	10.2%	428	11.1%	474	9.9%	1,821	11.4%	1,251	10.7%	4,322	10.9%	10.3%	10.8%
Accommodation and Food Services	299	8.8%	233	6.0%	535	11.1%	1,055	6.6%	867	7.4%	2,989	7.5%	6.7%	6.1%
Transport, Postal and Warehousing	198	5.8%	161	4.2%	168	3.5%	622	3.9%	465	4.0%	1,614	4.1%	4.9%	4.7%
Information Media and Telecommunications	10	0.3%	34	0.9%	26	0.5%	102	0.6%	57	0.5%	229	0.6%	2.3%	2.0%
Financial and Insurance Services	32	0.9%	77	2.0%	79	1.6%	264	1.7%	157	1.3%	609	1.5%	5.0%	4.1%
Rental, Hiring and Real Estate Services	25	0.7%	33	0.9%	51	1.1%	146	0.9%	97	0.8%	352	0.9%	1.6%	1.4%
Professional, Scientific and Technical Services	92	2.7%	150	3.9%	138	2.9%	495	3.1%	301	2.6%	1,176	3.0%	7.9%	7.8%
Administrative and Support Services	69	2.0%	76	2.0%	73	1.5%	269	1.7%	208	1.8%	695	1.8%	3.3%	3.3%
Public Administration and Safety	126	3.7%	219	5.7%	223	4.6%	606	3.8%	356	3.1%	1,530	3.9%	6.1%	5.3%
Education and Training	250	7.3%	257	6.6%	301	6.3%	1,082	6.8%	663	5.7%	2,553	6.4%	7.9%	8.0%
Health Care and Social Assistance	403	11.8%	509	13.2%	437	9.1%	1,932	12.1%	1,351	11.6%	4,632	11.7%	11.6%	11.6%
Arts and Recreation Services	29	0.8%	23	0.6%	82	1.7%	192	1.2%	112	1.0%	438	1.1%	1.5%	1.7%
Other Services	128	3.8%	128	3.3%	134	2.8%	612	3.8%	399	3.4%	1,401	3.5%	3.7%	3.6%
Inadequately described	45	1.3%	47	1.2%	57	1.2%	170	1.1%	139	1.2%	458	1.2%	1.3%	1.3%
Not stated	48	1.4%	50	1.3%	66	1.4%	222	1.4%	169	1.4%	555	1.4%	1.2%	1.1%
Total	3,413	100.0%	3,868	100.0%	4,811	100.0%	15,939	100.0%	11,670	100.0%	39,701	100.0%	100.0%	100.0%

Source: ABS Census of Population and Housing 2011

2.5 Business Structure

One of the more tangible benefits of a major investment project, such as the proposed Currawarra Solar Farm, is the extent to which local businesses can participate in the project through project contracts and other service provision.

ABS Business Count data for 2016 (latest available) shows the Study Area includes 1,403 construction businesses and a further 592 businesses associated with transport, postal and warehousing service, with these two sectors contributing 1,995 businesses or 18% of all businesses located in the Study Area.

This data, which is included in Table 2.5, 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 2.5: Business Structure – Study Area, 2016

Business Types	Deniliquin SA2		Moama SA2		Deniliquin Region SA2		Wentworth- Balranald Region SA2		Tocumwal – Finley – Jerilderie SA2		Campaspe Shire Council LGA		Moirra Shire Council LGA		Study Area	
	No.	Share	No.	Share	No.	Share	No.	Share	No.	Share	No.	Share	No.	Share	No.	Share
Agriculture, Forestry and Fishing	126	18.3%	42	10.4%	541	59.9%	297	60.2%	582	44.9%	1468	35.0%	1188	38.4%	4,244	38.3%
Mining	0	0.0%	0	0.0%	0	0.0%	4	0.8%	0	0.0%	6	0.1%	6	0.2%	16	0.1%
Manufacturing	20	2.9%	28	7.0%	27	3.0%	15	3.0%	33	2.5%	173	4.1%	134	4.3%	430	3.9%
Electricity, Gas, Water and Waste Services	6	0.9%	3	0.7%	3	0.3%	0	0.0%	3	0.2%	5	0.1%	11	0.4%	31	0.3%
Construction	96	14.0%	89	22.1%	62	6.9%	39	7.9%	119	9.2%	602	14.3%	396	12.8%	1,403	12.7%
Wholesale Trade	14	2.0%	18	4.5%	14	1.6%	4	0.8%	32	2.5%	83	2.0%	71	2.3%	236	2.1%
Retail Trade	39	5.7%	17	4.2%	20	2.2%	12	2.4%	65	5.0%	281	6.7%	180	5.8%	614	5.5%
Accommodation and Food Services	35	5.1%	34	8.5%	44	4.9%	24	4.9%	59	4.6%	157	3.7%	121	3.9%	474	4.3%
Transport, Postal and Warehousing	60	8.7%	19	4.7%	37	4.1%	30	6.1%	77	5.9%	197	4.7%	172	5.6%	592	5.3%
Information Media and Telecommunications	3	0.4%	3	0.7%	3	0.3%	0	0.0%	0	0.0%	8	0.2%	6	0.2%	23	0.2%
Financial and Insurance Services	68	9.9%	26	6.5%	32	3.5%	5	1.0%	48	3.7%	236	5.6%	131	4.2%	546	4.9%
Rental, Hiring and Real Estate Services	66	9.6%	48	11.9%	50	5.5%	15	3.0%	115	8.9%	306	7.3%	211	6.8%	811	7.3%
Professional, Scientific and Technical Services	50	7.3%	22	5.5%	16	1.8%	12	2.4%	38	2.9%	190	4.5%	121	3.9%	449	4.1%
Administrative and Support Services	18	2.6%	13	3.2%	16	1.8%	6	1.2%	25	1.9%	74	1.8%	60	1.9%	212	1.9%
Public Administration and Safety	3	0.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	0.1%	10	0.3%	16	0.1%
Education and Training	3	0.4%	5	1.2%	3	0.3%	6	1.2%	7	0.5%	25	0.6%	13	0.4%	62	0.6%
Health Care and Social Assistance	23	3.3%	17	4.2%	12	1.3%	0	0.0%	23	1.8%	124	3.0%	83	2.7%	282	2.5%
Arts and Recreation Services	4	0.6%	3	0.7%	3	0.3%	3	0.6%	8	0.6%	29	0.7%	19	0.6%	69	0.6%
Other Services	49	7.1%	12	3.0%	13	1.4%	12	2.4%	47	3.6%	180	4.3%	127	4.1%	440	4.0%
Not Classified	5	0.7%	3	0.7%	7	0.8%	9	1.8%	14	1.1%	51	1.2%	32	1.0%	121	1.1%
Total	688	100.0%	402	100.0%	903	100.0%	493	100.0%	1,295	100.0%	4,198	100.0%	3,092	100.0%	11,071	100.0%

Source: ABS Counts of Australian Businesses, including Entries and Exits, June 2012 to June 2016

2.6 Township Services Capacity

Commercial Accommodation

The ability to accommodate non-local workers (ie those who are not resident in the Study Area or not living within a daily commutable distance) is a key consideration for major construction projects, especially in regional and rural areas underpinned by agricultural activity that are subject to seasonal demand for labour (eg harvesting) .

As Table 2.6 highlights, the Study Area has a significant supply of commercial accommodation as measured by the ABS Tourism Accommodation series for the March Quarter 2016. This data, which identifies supply for hotels, motels and apartments with 15 rooms or more, shows the Study Area has 50 establishments, 1,400 rooms and 4,170 beds reflecting the high level of tourism associated with this general region. Deniliquin, which would be the most convenient location to house project workers, has 8 establishments, 200 rooms and 676 beds. Room and bed occupancy rates can be considered modest (noting, this data related to the peak summer period), indicating the solar farm project will boost the commercial accommodation sector, especially during off-peak periods. This factor is further discussed in section 3.5.

Table 2.6: Hotel, Motel and Apartments Accommodation (with 15 Rooms or more) – Study Area, March Quarter 2016

	Establishments	Rooms	Beds	Room Occupancy Rate	Bed Occupancy Rate
Echuca	14	433	1,119	58%	40%
Deniliquin Region	8	199	676	42%	20%
Moama	11	351	1,031	57%	42%
Tocumwal - Finley - Jerilderie	17	413	1,342	32%	18%
Study Area	50	1,396	4,168	48%	30%

Source: ABS Tourism Accommodation, Australia 2015-16

In addition to commercial accommodation outlined above, the Study Area also provides a range of additional options which might be used for worker accommodation, including the following:

- Caravan/ Holiday parks providing cabins, such as:
 - BIG4 Deniliquin Holiday Park
 - Deniliquin Riverside Caravan Park
 - McLean Beach Holiday Park, Deniliquin
 - Pioneer Tourist Park, Deniliquin
 - Murray River Holiday Park, Moama
 - Moama Riverside Holiday & Tourist Park
 - Echuca Holiday Park

- Bed and Breakfast
- Guest houses

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 or through real estate. ABS Census data for 2016, indicates the Study Area has an above average level of vacant dwellings – which is consistent with a tourist region including many holiday homes. As Table 2.7 shows, 14.4% of Study Area dwellings were unoccupied at the Census, which is well above the average for NSW (9.9%) and Victoria (11.7%). Shared private housing accommodation is one potential option for the solar farm project, and this is further explored in section 3.5.

Table 2.7: Unoccupied Dwellings – Study Area, June 2016

	Occupied Dwellings	Unoccupied Dwellings	Total Dwellings	Unoccupied Dwelling Share
Berrigan Shire Council (NSW)	3,260	640	3,900	16.4%
Edward River Council (NSW)	3,380	470	3,850	12.2%
Murray River Council (NSW)	4,470	930	5,400	17.2%
Campaspe Shire Council (VIC)	13,860	1,990	15,850	12.6%
Moira Shire Council (VIC)	10,900	2,020	12,920	15.6%
Study Area	35,860	6,050	41,920	14.4%
New South Wales	2,604,320	284,740	2,889,060	9.9%
Victoria	2,112,700	278,630	2,391,330	11.7%

Source: ABS Census of Population and Housing, 2016

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 and other services from businesses located in the immediate region. The following paragraphs provide an overview of the services located in the main townships in the Study Area – Deniliquin, Echuca and Moama. Other smaller settlements such as Cobram, Finley, Mathoura and Tocumwal are likely to support the project in some capacity, especially with regard to labour supply.

Deniliquin (NSW)

Figure 2.1: Images of Deniliquin Town Centre



Source: www.tripadvisor.com.au; www.aussietowns.com.au/town/deniliquin-nsw

Deniliquin, with a population of approximately 8,000 persons, is the main service centre for the Edward River region and provides many key services likely to be required to support a major infrastructure project such as the proposed solar farm. Deniliquin is located approximately 25km south-west of the subject site, or a 20-minute drive.

Deniliquin's key services include:

- Freight and transport services (Deniliquin Freighters, Fellows Haulage)
- Auto mechanics
- Steel fabricators (North Deniliquin Steel Suppliers)
- Construction firms (Deniliquin Hire Services, Joss Construction Group, Hawley Construction, Murrays Constructions).
- Concreters (Deniliquin Concreting/Mawsons Quarries)
- Engineering services (KB Engineering, DLS Engineering, Ennor Engineering)
- Trade Suppliers (Mitre 10, Dahlsens)
- Fuel supplies (BP Caltex, Metro Petroleum)
- Commercial and private accommodation (see above Tables)
- Retail services - including Coles and IGA supermarkets and Deniliquin Plaza Shopping Centre
- Cafes and restaurants
- Entertainment (hotels, clubs, sports and recreational facilities)

- Major banks and financial institutions
- Real estate agents (Big River Real Estate, Elders, First National Real Estate, Ray White Deniliquin)
- Postal services
- Employment agencies (Summit Employment and Training, Murray Mallee Training, The Personnel Group)
- Medical and emergency services including:
 - Deniliquin Hospital, with a 24 hour emergency department
 - Deniliquin Medical Centre
 - Fire services
 - Police services
 - Deniliquin SES unit.

Echuca (VIC)

Figure 2.2: Images of Echuca Town Centre



Source: www.tripadvisor.com.au; www.bing.com

Echuca is the administrative centre in the Shire of Campaspe and a major Victorian regional centre with a population of 14,500 persons (2016). Echuca is located 100km to the south-west of the Currawarra Solar Farm site, with a drive time of approximately 75 mins.

As a major centre, Echuca provides a significant range of services to support major infrastructure projects with examples including the recent redevelopment of Echuca Hospital (\$66 million) and the current construction of the second Echuca-Moama Bridge crossing (\$280 million).

Echuca's services include the following:

- Civil construction firms (Northern Construction Group, Planwright)
- Transport and haulage firms (Neil's Transport, Echuca Moama Transit)

- Equipment hirers (Echuca Hire, Central Hire Echuca)
- Excavating & earth moving contractors (G& K Kennaugh)
- Concreters (Echuca Concreting/Mawsons Quarries)
- Trade supplies (Bunnings Warehouse, Mitre 10, Dahlsens)
- Significant supply of commercial accommodation options (430 commercial rooms, refer to Table 2.6)
- Full range of retail facilities, including department stores
- Full range of banking, financial and insurance services
- Medical and emergency services including:
 - Major Regional Hospital, with 24-hour Emergency Department
 - CFA Echuca Fire Services
 - Echuca Police Station
 - Echuca SES unit
- Entertainment facilities (Echuca Paramount Cinema, pubs and clubs).

Moama (NSW)

Figure 2.3: Images of Moama Town Centre



Source: www.tripadvisor.com.au; www.bing.com

Moama is located approximately 2km north of Echuca over the Murray River in NSW. Moama is the administrative centre of the recently formed Murray River Shire and has an existing population of 6,160 persons (2016). Moama is located 95km to the south-west of the Currawarra Solar Farm site, with a drive time of approximately 70 mins.

The Moama Township plays a major role in supporting the regional tourism sector through many accommodation, retail and entertainment facilities.

Potential services located in Moama which might support the solar farm project include the following:

- Transport and logistics firms (Geoff Pilgrim Transport, Rich River Trading & Transport Pty Ltd)
- Construction firms (Farrell's Fencing, The Green Pipe (civil drainage pipes))
- Significant supply of commercial accommodation options (350 commercial rooms, refer to Table 2.6)
- Moama Marketplace, including Woolworth's supermarket and specialty stores
- Fuel supplies (BP, Caltex)
- NSW Fire and Rescue Service
- Moama SES unit
- Moama Medical Centre
- Entertainment (Moama RSL, Moama Sports Club).

2.7 Conclusions

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

- 1 The Study Area has a resident population of around 95,000 persons (2016), which is expected to reach approximately 99,000 persons by 2031 representing a modest annual growth rate of 0.3% over the period. Importantly, population decline is forecast for the Edward River Shire and adjoining Berrigan Shire (-1,250 persons) over the 2016-31 period; therefore, major projects which stimulate new investment and jobs should be encouraged in terms of supporting the regional economy.
- 2 The Study Area currently has an unemployment rate of 5.1%, which is the same as the NSW unemployment rate and below the Victorian unemployment rate of 5.8%. However, unemployment in Edward River Shire is relatively high (5.9%) and the Study Area currently includes 2,300 persons who are unemployed. In this regard construction of the Currawarra Solar Farm project provides new short-term employment opportunities for the region's labour force participants, with a small amount of ongoing employment also supported once the facility is operational (refer to section 3.2, following).
- 3 The Study Area's occupational, industry and business structures indicate a good base exists to service the needs of the solar farm project, including approximately 14,400 construction-related workers (based on occupation) and 2,000 construction and transport businesses.
- 4 Deniliquin, given its close proximity to the subject site, will underpin most project needs in view of its supply of commercial accommodation (200 rooms), trade supplies and transport services, machinery hire and repairs, retail services, hospital and so on. However, the major regional city of Echuca (just over an hour from the subject site) is also likely to be important for the project in terms of labour supply, construction and trade services, transport and logistics and higher-order medical and emergency services.

3 ECONOMIC IMPACT ASSESSMENT

3.1 Project Investment

The total construction cost for the Currawarra Solar Farm project is estimated to be approximately \$250 million, according to information provided by RES. The major investment cost is associated with the purchase of PV panels and associated equipment, although significant investment is also required for civil, electrical and grid connection works. Additional investment will be required with regard to project management, financing, insurance and other project costs.

3.2 Project Employment

Construction Phase

Project employment is assessed in terms of **Direct** jobs (ie, site-related) and **Indirect** (or flow-on) jobs in the local and wider economies (ie, jobs that are generated by the employment multiplier as funds circulate around the economy between various industry sectors).

Direct Construction Employment

RES have indicated that 200 jobs will be generated as part of the Currawarra Solar Farm, over the lifetime of the construction phase which is expected to be approximately 18 months. These jobs include full time, part-time and casual labour employed on the project.

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

- Manufacture of PV support structures
- Fabrication
- 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
- Trade services
- Fuel supplies
- Security
- Waste disposal
- Business, finance and 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, principally in Deniliquin, Moama and Echuca. It is reasonable to expect, therefore, that local and regional businesses will be well-positioned to secure contracts during the construction phase of the project.

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 2.6 (based on ABS Input-Output tables), the project is estimated to generate an additional 320 jobs over the construction period.

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

Total Construction Employment

In summary, approximately 520 jobs (200 direct jobs and 320 indirect jobs) are expected to be generated by the Currawarra Solar Farm project during the 18-month construction phase.

The amount of local employment required at the peak of the project is estimated by the proponent to be approximately 200 jobs. This represents just over 1% of the Study Area's labour force who are occupied in construction-related activities (14,420 persons) and this should not present a constraint to labour supply for the project.

It would be prudent, however, to carefully manage construction activities with regard to the main agricultural harvesting season when local labour supply is likely to be most in demand and be cognisant of the staged construction of the Echuca-Moama Bridge project to avoid labour supply issues.

Operational Phase

Direct Operational Employment

RES Australia indicate that around 4 jobs will be supported on an ongoing basis through the operation and maintenance of the Currawarra Solar Farm, including employment supported in the Study Area and supported centrally at Head Office.

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 3.9 (based on ABS Input-Output tables) to the direct operational and maintenance jobs, a further 12 permanent jobs (rounded) would be generated in the wider State and national economies, but some of these jobs would be generated locally through existing supply chains.

Operational-related employment is for the lifetime of the project (ie, at least 25 years); therefore, while job creation is relatively small, it represents new long-term employment opportunities at a local, regional and state-wide level.

For the purposes of this assessment we assume 75% of direct jobs and 25% of indirect jobs are created in the Study Area. This equates to approximately 6 ongoing new positions created in the Study Area through the Currawarra Solar Farm project.

Total Operational Employment

In summary, approximately 16 jobs (4 direct and 12 indirect) are expected to be generated by the Currawarra Solar Farm project through its ongoing operations, of which 6 positions are expected to be created locally.

3.3 Concurrent Infrastructure Projects in the Study Area

The Currawarra Solar Farm project may need to compete for labour and resources with proposed infrastructure projects in the broader region over the coming years. These projects include:

- Echuca-Moama Bridge Project
- Deniliquin Ethanol Plant
- Tarleigh Park Solar Farm
- Edward River Council Major Projects Program

It appears that these projects do not represent a major challenge for the Currawarra Solar Farm project, either in terms of resource requirements or timing conflicts with other major regional project (as described below).

Based on the timing of identified infrastructure projects in the Study Area, the Currawarra Solar Farm project will add to the pipeline of important construction projects to be delivered over the next 4-5 years and in doing so provide an ongoing stimulus to the construction sector and regional economy.

Echuca Moama Bridge Project

The Echuca-Moama Bridge project will provide a second Murray River crossing to connect Echuca and Moama. The \$280 million project is jointly funded by the Australian, Victorian and New South Wales governments.

The project will be delivered in stages over a number of years, with the project anticipated to be completed by the end of 2020.

Stage 1 of the project has now commenced, and involves upgrading the Murray Valley Highway/Warren Street intersection, including constructing a major new roundabout.

Details of further stages of the project are not available at present.

Deniliquin Ethanol Plant

Dongmun Greentec Pty Ltd is proposing to construct and operate an ethanol plant at Deniliquin, on Barham Road. The site is located approximately 5 km south-west of Deniliquin and comprises three lots on approximately 120 hectares of land.

The ethanol plant will process up to 300,000 tonnes of low grade locally grown wheat grain to produce up to 115 megalitres of fuel grade ethanol per annum. The ethanol product can be blended with petrol to produce E10 petrol which produces less greenhouse gas emissions. By-products of the process will include a dried distiller's grain with solubles (DDGS), distiller's syrup and liquid fertiliser. All of the by-products are proposed to be sold to regional feedlot, dairy operations and nationally through other agricultural markets as feed material.

The NSW Department of Planning & Environment approved the project on 1 July 2016. The project is now undergoing construction approvals and detailed design process. An estimated 350 jobs will be created during the construction phase of the \$170 million project. The proponent expects the major construction phase (ethanol plant) to commence in late 2017 and be completed by the end of 2018. Ancillary shedding and offices will be constructed at a later stage. Should this schedule be delivered, the ethanol plant would be completed around the time the Currawarra Solar Farm commences construction.

Tarleigh Park Solar Farm

The Tarleigh Park Solar Farm (RES Australia) is a proposed 90MW facility to be located 23km south-east of Deniliquin at Blighty. Subject to planning approval and financing, construction of the solar farm is expected to commence in late 2018 and be completed within 12 months. Approximately 150 workers will be required during the construction phase of the project.

The Tarleigh Park and Currawarra solar farms are located just 16km apart, and it is the intention of RES to construct both facilities concurrently which will enable efficient use of labour and other resources.

Edward River Council Major Projects Program

Edward River Council is investing \$8.6 million (through the NSW Stronger Communities Fund) into 12 infrastructure projects across the Edward River region. These projects are:

- Deniliquin Swim Centre Revitalisation
- Community Masterplans and Initial Works (Riverfront, Town Centre, Arts & Cultural Precinct and Deniliquin Sports Precinct)
- Deniliquin Regional Sports and Entertainment Stadium Extension
- Blighty Community Netball and Tennis Facility construction
- Deniliquin Children's Centre Extension
- Deniliquin Netball Facility Improvement Works
- Rural Villages Beautification Project
- Beach to Beach Walk Connectivity Improvements
- Deniliquin Community Facility Refurbishments
- Deniliquin Urban Road Infrastructure Program
- Deniliquin Airport Heritage Centre Development
- Unallocated Funding for New Council infrastructure project

It is important to recognise that most of these projects are small-scale, ranging from \$50,000 to \$2.4 million and therefore will not involve significant resources. Further, the terms of the Community Fund mean that all projects need to be completed by 30 June 2019, with many finalised well before the Currawarra Solar Farm project commences.

3.4 Industry and Business Participation Opportunities

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

As identified above, the Study Area comprises approximately 1,400 construction firms and many other businesses associated with activities likely to be required for the project, such as transport operators, trade suppliers, vehicle and machinery hire, auto mechanics etc.

Within the Study Area the major regional centres of Echuca and Deniliquin have many firms of sufficient scale to compete for project contracts. Examples include Echuca-based RE Civil Pty Ltd who have been awarded the contract to construct Stage 1 of the Echuca-Moana Bridge

project and Cobram-based CPE Construction which has been involved in the Echuca Hospital Redevelopment and Echuca Regional Library construction

In order to maximise local business participation, a number of strategies might be considered such as widespread advertising of contracts in local media and directly through the RES website etc.

The Industry Capability Network (ICN) is another organisation that often plays an important business facilitation role for major infrastructure projects, such as the proposed solar farm. The ICN is an independent, non-profit organisation funded by the Federal Government to support business opportunities, including linking suppliers to project contracts at a local level through its ICN Gateway website where details of work packages are advertised.

3.5 Housing and Commercial Accommodation Sector Impacts

Information supplied by RES Australia indicates that up to 60 non-local staff may need to be accommodated in the region at the project's peak. These staff will include occupations such as general management, project management and supervising engineers. Contract lengths will vary. This highlights the need for a number of types of accommodation which would be expected to range from higher-end options for professional staff on longer contracts, to convenient low-cost options for those on short-term contracts.

As highlighted in Chapter 2, the Study Area has a capacity of around 1,400 rooms and equivalent to approximately 4,170 bed spaces in commercial accommodation establishment (hotels, motels and apartments with 15 rooms or more). Assuming each non-local worker requires individual accommodation, only approximately 4% of total accommodation stock would be required at peak times to service the project. This requirement is likely to be even lower as some workers may choose to be accommodated in Caravan /Holiday Parks (cabins), B&Bs, private rentals (holiday homes) or with family or friends – none of these categories are included in the accommodation audit. Additionally, some workers may share motel rooms/ cabins etc to reduce personal costs.

ABS Tourism Accommodation data for the March Quarter 2016 (refer to Table 2.7), shows the Study Area had a room occupancy rate of 48% and a bed occupancy rate of 30% for its hotels, motels and serviced apartments (with 15 rooms or more). In the Deniliquin Region, which would be the most convenient location to house non-local workers, room occupancy and bed rates are even lower at 42% and 20% respectively. Note, these moderate occupancy rates cover the peak summer holiday period (December, January and February, 2016).

This data indicates that adequate capacity exists in the Study Area to accommodate the relatively small numbers of non-local workers expected at the peak of the solar farm project, even allowing for increased demand from other regional infrastructure projects and seasonal demands (holiday periods, harvesting etc). Importantly, the influx of these workers will support higher occupancy rates and revenues for local accommodation operators (especially in Deniliquin) over the construction period, particularly during off-peak periods.

3.6 Local Wage Spending Stimulus

RES estimate that 30% of the 200 jobs in construction (60 jobs) are likely to be sourced from outside the Study Area, particularly specialist and management positions.

This level of employment would equate to \$4.8 million in wages (2017 dollars) on the basis that each non-local worker is employed for 12 months across the 18 month project and earns the average construction wage of \$80,000 pa including on-costs (source: ABS, *Average Weekly Earnings 6302.0*, May 2017).

A considerable portion of these wages would be spent in the Study Area, where the workers will be based. An estimated \$2.7 million in wages (2017 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 Deniliquin, Echuca, Moama and other Study Area locations. 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 local prescriptions and GP fees, fuel, vehicle maintenance and so on.

This level of personal spending would support approximately 13.5 jobs in the services sector (based on 1 job allocated for every \$200,000 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 Impact on Agricultural Land

The potential impact of the Currawarra Solar Farm on agricultural activity is noted as follows:

- Approximately 620ha of productive farming land will be unable to be used during the lifetime of the solar farm, which represents 80% of the 750ha site.
- This will affect land used principally for cropping, with the site being extensively cropped over many years.
- NSW Trade and Investment data (based on the ABS Agricultural Census 2011) identified approximately 25,000ha of productive agricultural land was located in the Deniliquin LGA (now part of the larger Edward River Council), of which approximately 22,500ha

were used for cropping. This data shows only a small amount of productive land will be lost in the immediate Deniliquin area due to the development of the proposed solar farm (ie, 2.5% of all productive agricultural land supply or 2.7% of total cropping supply in the Deniliquin LGA).

The broader NSW Murray Region contains approximately 910,000ha of productive agricultural land supply, of which 770,000ha are used for cropping. In this regional context, the loss of agricultural land associated with the Currawarra Solar Farm amount to just 0.07% of all productive agricultural land supply and 0.08% of total cropping supply.

- The property owner will be compensated for hosting the solar farm through annual payments from the solar farm operator. It is understood that these payments would result in significantly higher farm income compared with continuation of cropping activities on the subject site.
- The land can be rehabilitated to its original condition at the end of the project when all above ground infrastructure is removed, allowing cropping (or other activities) to recommence.

3.8 Ongoing Economic Stimulus

RES advise that the solar farm will be located across a single property, providing annual income returns to the landowner over the hosting period.

These new income streams can be particularly important in supporting the financial sustainability of large rural farms.

As noted earlier, securing a guaranteed 25-year drought-proofed income stream (indexed to CPI) also allows farming families more flexibility in the long-term planning for their farming operations, including succession planning and providing ongoing income for future generations or new landowners.

Additionally, an estimated 6 permanent jobs will be created through the project in the Study Area (refer to section 3.2), and wage spending associated by these jobs will benefit local businesses and communities.

Based on data provided by RES relating to potential host landowner returns and the consultants calculations of new wage spending, the Study Area's economy will receive an estimated stimulus of \$35.9 million over 25 years (adjusted for CPI) through these effects.

3.9 Returns to Council and the Community

Council Rates Revenue

Unlike other states (such as Victoria), NSW does not currently have in place a legislative framework to determine rates payable for electricity generating facilities.

Revenues payable to Edward River Council associated with the operation of the Currawarra Solar Farm; therefore, will be subject to negotiation between Council and RES.

By way of illustrating potential revenue benefits to Council from the solar farm, if the proposed facility was developed in neighbouring Victoria, an estimated \$11.6 million would be generated in Council rates over 25 years (includes CPI adjustment) under State legislation.

This level of potential income presents an important increase in the rates base for the municipality – especially in an environment of rate pegging and forecast population decline which will further erodes the amount of rates revenue collected in the future.

Unlike a new residential development (where Council incurs costs such as garbage collection; maintenance of parks, open space, roads, footpaths; provision of community services; etc) the cost to Council of providing resources for the solar farm site is likely to be relatively small and would be limited to road maintenance, garbage removal etc. Therefore, rates revenues generated from the operation of the solar farm will represent a substantial net return to Council.

Importantly, this revenue can be re-invested in infrastructure and services, which will benefit the community more generally.

Community Fund

RES is committed to providing \$50,000 pa (linked to CPI) to a Community Fund associated with the Currawarra Solar Farm facility. This equates to \$1.7 million over 25 years (adjusted for CPI). The Community Fund could be used to support a range of projects which might include environmental and local community projects.

A fund of this type will assist with the delivery of community infrastructure and programs, which, as noted above, are especially important in rural areas with relatively small rates revenue bases (which are subject to rate pegging) and those experiencing population decline (such as Edward River Shire). This guaranteed annual income can be allocated for specific community purposes and, as such, provides a positive legacy for the project.

The Community Fund would likely be managed by a local community group or Edward River Council, which RES would help facilitate.

3.10 National Grid Supply Benefits

The Currawarra Solar Farm has the potential to provide sufficient renewable energy to support the annual electricity needs of approximately 78,000 NSW households. This calculation is based on

- 195 MW capacity x 24 hours per day x 365 days per year x 27.8% capacity factor = 466,400 MWh / by average household energy use of 5,920kwh (Source: Australian Energy Regulator).

In a regional context, the Study Area currently contains approximately 38,000 dwellings (95,000 persons / 2.5 persons per household); therefore, the Currawarra Solar Farm has the potential to provide the annual electricity needs of the Study Area twice over, highlighting the importance of the facility from a clean electrical generation perspective.

3.11 Environmental Benefits

Once fully-operational, the Currawarra Solar Farm will result in the reduction of an estimated 155,000 tonnes in carbon dioxide (CO²) emissions on an annual basis compared to the same level of electricity generation using fossil fuels. This calculation is based on:

- $466,174 \text{ MWh} \times 0.33372 \text{ tonnes/MWh} = 155,627 \text{ tonnes saved per year}$ (assuming generation would otherwise be sourced from brown coal with a carbon factor = 0.33372 tonnes per MWh (Source: Department of the Environment National Inventory Report)).

This reduction on CO² emissions is the equivalent of taking approximately 55,000 cars off the road annually, based on an average of 14,000km travelled with CO₂ emissions of 200g/km (or 2.8 tonnes of CO² emissions per car pa).

3.12 Tourism Opportunities

The Currawarra site is remotely located and situated on private land, limiting the tourism potential of the facility. However, the uniqueness of two solar farms located only a short apart might provide a longer-term opportunity to attract new visitors to the area, if suitable arrangements can be put in place regarding access to the sites.

Potential visitor types include:

- Environmentalist
- Researchers
- Eco-tourists
- School and educational groups

Benefits of attracting new visitors to the region include increased expenditures on accommodation, food and beverage, fuel, retail, entertainment etc, all of which will support businesses and employment, especially in nearby Deniliquin.

3.13 Conclusions

- 1 The Currawarra Solar Farm project will involve approximately \$250 million in investment during the construction phase and will support 200 direct and 320 indirect positions over the construction period. Once operational, 4 direct and 12 indirect jobs will be supported by the facility.

- 2 Allowing for the project to be carefully managed around the region's peak times for harvesting activity and the scheduling of the Echuca-Moama Bridge project, accessing adequate labour supply should not present a major issue for the project, noting the peak local employment requirement for the project represents just over 1% of workers occupied in construction-related activities in the Study Area.
- 3 Concurrent infrastructure projects in the Study Area – including the Deniliquin Ethanol Plant, the Echuca-Moama Bridge project, and Edward River Major Projects Program – are unlikely to impact on labour and resources required to support the solar farm project, for the following reasons :
 - The Currawarra Solar Farm project requires a relatively small amount of labour (200 jobs), with some of these positions sourced from outside the Study Area
 - Different construction time frames/ staging associated with competing projects
 - The large construction-base available in the Study Region (ie 14,400 construction-related workers and 2,000 construction-related businesses) which can support a pipeline of infrastructure projects.
- 4 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. In this regard, the proponent and organisations such as the Industry Capability Network might be involved in ensuring maximum local inputs are secured.
- 5 The 'external' project labour requirement would be expected to generate an accommodation need for 60 project workers at the peak of the project. This represents only 4% of total commercial accommodation rooms in the Study Area and would provide a boost to local accommodation operators, noting that room occupancy rates of less than 50% were recorded during the peak tourism period (March Quarter, 2016) in the Study Area with occupancy rates closer to 40% in the Deniliquin Region over this period.
- 6 Construction workers would be expected to inject approximately \$2.7 million in additional spending into the regional economy over the construction phase, supporting around 13.5 jobs in the service sector in Deniliquin and the broader Study Area.
- 7 Approximately 620ha of productive agricultural land (cropping) will be lost to accommodate the solar farm. However, this represents just 0.1% of all productive cropping land supply in the NSW Murray Region. Importantly, the host landowner will improve their annual income, as operator payments will be greater than average farm income from the land and the land can be returned to cropping at the end of the solar farms lifecycle.
- 8 Ongoing economic stimulus associated with new local wage spending and returns to the host landowner is estimated at \$35.9 million over 25 years (adjusted for CPI).
- 9 Council rates revenue associated with the solar farm will be subject to negotiations between Edward River Council and the proponent; however, financial benefits to Council are likely to be significant over the 25-year project lifecycle.

- 10 The proposed Community Fund would contribute a further \$1.7 million (adjusted for CPI) over the 25-year period and this can be directed to new community infrastructure and programs.
- 11 The project has the capacity to supply sufficient clean energy to power approximately 78,000 homes and, in the process, to reduce CO² emissions by 155,000 tonnes per year.
- 12 Once operational, the Currawarra Solar Farm and the nearby Tarleigh Park Solar Farm will present a unique environmental experience for the region, which could potentially support small-scale tourism and educational opportunities in the future.