



ESSENTIAL ECONOMICS

Pallamana Solar Farm Project

Economic Impact Assessment

FINAL

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RES Australia

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Authorship

Report stage	Author	Date	Review	Date
Draft report	John Noronha Will Keating Rob Weston	14 December 2017	John Henshall	15 December 2017
Final report	John Noronha	8 May 2018		

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Contact details

For further details please contact Essential Economics Pty Ltd at one of our offices:

96 Pelham Street

Carlton

Victoria 3053

Australia

PH +61 3 9347 5255

FAX +61 3 9347 5355

Level 26 / 44 Market Street

Sydney

New South Wales 2000

Australia

PH +61 2 9089 8654

EMAIL mail@essentialeconomics.com

WEB www.essentialeconomics.com

ABN 92 079 850 427

Our Reference: 17205 (b)

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EXECUTIVE SUMMARY

RES Australia Pty Ltd (RES) have commissioned Essential Economics Pty Ltd to prepare an Economic Impact Assessment (EIA) for the proposed 176 Mega Watt (MW) Pallamana Solar Farm development to be located 75km south east of Adelaide and 5km north of Murray Bridge in South Australia.

The solar farm facility, which is subject to planning approval from State Government under a Crown Sponsorship (Section 49) application process, will be located across a 730ha site, with construction anticipated to start in late 2018. Subject to planning approval and financing, the Pallamana Solar Farm facility is expected to be operational by mid-2020.

The main findings of this EIA are summarised as follows.

Regional Economic Context

- 1 The Study Area (which includes the Local Government Areas of Mount Barker, Mid Murray and Murray Bridge) has a resident population of around 64,000 persons (2016), which is expected to reach approximately 76,400 persons by 2031, representing annual growth of 1.2% pa over the period which is higher than the forecast State growth of 0.8% pa over the 15 years. However, the Mid Murray Council area is projected to decline in population at a rate of -0.5% pa over the coming 15 years, and therefore new infrastructure projects which provide local economic stimulus should be welcomed.
- 2 The Study Area currently has an unemployment rate of 7.0%, which is above the unemployment rate for South Australia of 6.7% and includes 2,330 persons who are unemployed. In this regard, construction of the Pallamana Solar Farm 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.
- 3 The Study Area's occupational and business structures indicate a good base exists to service the needs of the solar farm project, including approximately 10,300 construction-related workers (based on occupation) and 830 construction and transport businesses.
- 4 Mount Barker, Murray Bridge and Mannum, given their relatively close proximity to the subject site, will underpin most project needs in view of their supply of labour, commercial accommodation (300+ rooms), trade supplies and transport services, machinery hire and repairs, retail services, emergency services and so on.

Economic Impact Assessment

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

- 6 Accessing adequate labour supply should not present a major issue for the project, noting the peak local employment requirement for the project (140 workers) represents only 1% of workers occupied in construction-related activities in the Study Area (10,260 workers).
- 7 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.
- 8 The 'external' project labour requirement is expected to generate an accommodation need for 60 project workers at the peak of the project. This represents 18% of total commercial accommodation rooms (hotels and motels) in the Study Area and would provide a boost to local accommodation operators, noting room occupancy rates were just 56% during the June Quarter, 2016. Other providers such as houseboat owners, caravan parks operators etc may also benefit in terms of increased accommodation revenues.
- 9 Construction workers are expected to inject approximately \$2.7 million in additional spending into the regional economy over the construction phase, supporting around 13-14 jobs in the service sector in the Study Area.
- 10 Approximately 730ha of productive agricultural land will be lost to accommodate the solar farm. However, this is negligible in a regional context (4.3 million ha) and noting the land can potentially be used for agricultural purposes at the end of the solar farm's lifecycle.
- 11 Ongoing economic stimulus associated with new local wage spending and returns to the host landowner are estimated at \$22.9 million over 25 years (adjusted for CPI).
- 12 Council rates revenue associated with the solar farm will be subject to negotiations between Murray Bridge Council and the operator; however, based on preliminary figures, rates revenue to Council is estimated at \$290,000 over the 25-year project lifecycle (including CPI adjustment) based on the exiting Capital Improved Value (CIV) of the site. However, CIV will increase significantly through the development of the solar farm, and a corresponding uplift in CIV and Council rates can be expected.
- 13 The proposed Community Fund would contribute to new community infrastructure and programs.
- 14 The project has the capacity to supply sufficient clean energy to power approximately 82,000 homes and, in the process, to reduce CO₂ emissions by 140,000 tonnes per year.
- 15 Once operational, the Pallamana Solar Farm will present a new 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 (EIA) for the proposed Pallamana Solar Farm development to be located 75km south east of Adelaide in South Australia. The solar farm site falls under the Local Government Area (LGA) of Murray Bridge.

The proposed development will be situated on a 730ha site which involves a single farming landholding. The solar farm will have an installed capacity of 176 MW powered by photovoltaic panels. Construction of the Pallamana Solar Farm, subject to planning approval and financing, is anticipated to start in late 2018 with the facility fully operational by mid-2020.

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, labour force, occupational structure, industry structure, business structure and township services, including an audit of available commercial accommodation in 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 community, and environmental benefits.

1 PROJECT CONTEXT

1.1 Site Location

The proposed Pallamana Solar Farm will be developed on a site located 5km north of the Murray Bridge township, approximately 75km south east of Adelaide.

The site is within a 10 minute drive from Murray Bridge, with Mt Barker located 35km to the west of the site. It is anticipated both Murray Bridge and Mount Barker will play important roles in servicing the project, including the provision of labour and accommodation.

The site which is shown in Figure 1.1 is approximately 730 hectares (ha) in area and located on Pallamana Road, making construction access relatively easy.

The site will be leased from the existing landowner and the land will be utilised for solar farm infrastructure.

A range of technical studies are currently underway – including ecology, landscape and visual, noise, cultural heritage, bushfire risk, access and transport, and drainage and storm water. Planning approval will be sought from the State Government under a Crown Sponsorship (Section 49) application process to facilitate the project.

Figure 1.1: Pallamana Solar Farm Site



1.2 Project Description

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

The arrays consist of 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.

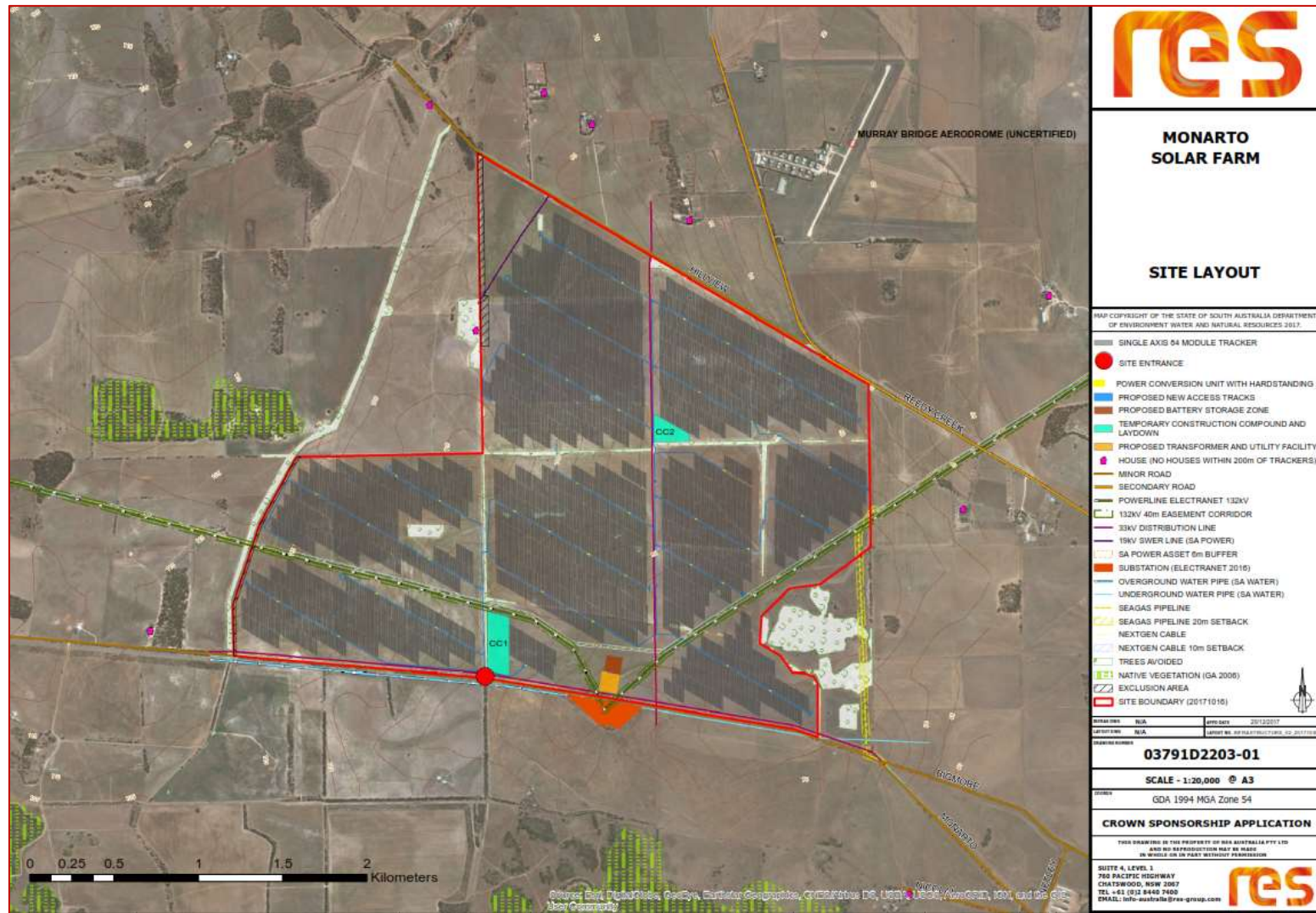
A number of graded tracks across the site will allow all-weather access for construction and operational maintenance. These tracks will vary in size from 2.0m to 6.0m.

An operations and maintenance building with associated carparking will be constructed to service the solar farm. Other on-site infrastructure includes access tracks, security fencing and CCTV.

The solar farm will be connected to the National Grid via a nearby substation located at the South Australia Water site.

The preliminary site layout is shown in Figure 1.2.

Figure 1.2: Pallamana Solar Farm – Preliminary Site Layout



Source: RES Australia

1.3 Study Area

The Study Area for the project is defined as the Local Government Areas of Mid Murray Council, Mount Barker Council and the Rural City of Murray Bridge, and includes the following townships located within 40km from the subject site (listed in order of distance from the subject site):

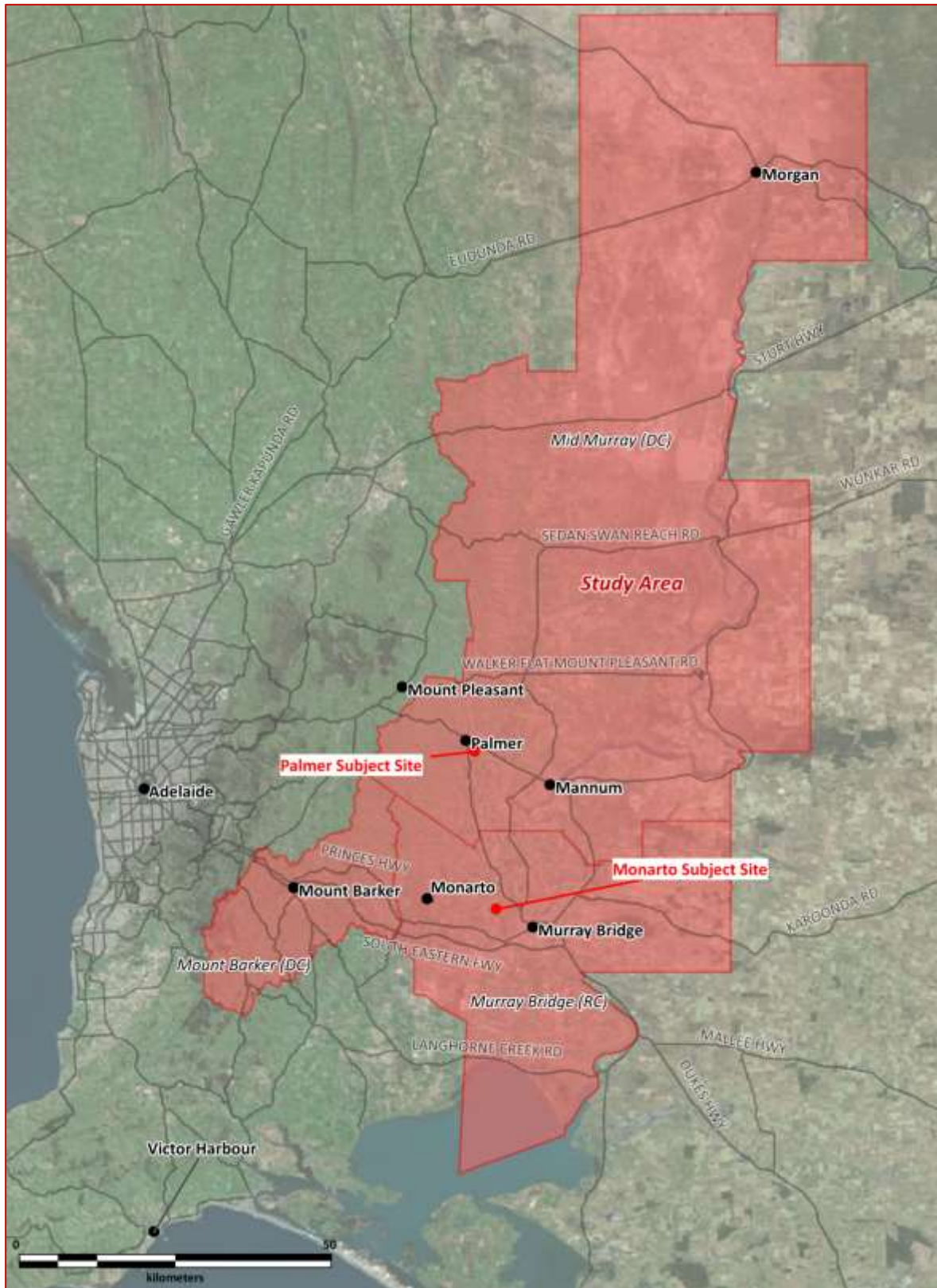
- Murray Bridge (5km)
- Pallamana (15km)
- Mannum (25km)
- Mount Barker (35km)

These townships, 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.

Some construction components and specialist labour will be sourced from outside the Study Area and this will include Adelaide, interstate and overseas (solar panels). The impacts of these factors are considered in the EIA.

Figure 1.3: Pallamana Solar Farm – Study Area



Source: Essential Economics, using MapInfo

1.4 Policy Context

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

Paris Climate Accord

The Paris Accord is a comprehensive international climate agreement to which Australia is a party. The Accord provides a framework for participating nations to set themselves nationally-determined contributions (NDCs), beginning in 2020 with review at five-year intervals. The agreement sets out a global consensus to limit temperature increases to below two degrees Celsius when compared to pre-industrial levels; an additional goal is to maintain this increase at less than one and a half degrees Celsius. NDCs do not have any set lower limit but are required to progress over time (beginning with the intended NDC pledged during the Paris conference), and to be 'ambitious'. Australia's current targets are a reduction of emissions by five percent from 2000 levels by 2020, and by 26-28 percent below 2005 levels by 2030.

Federal Renewable Energy Target

The Renewable Energy Target (RET) 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 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.

Finkel Report

The Independent Review into the Future Security of the National Electricity Market, released in June 2017, is a report commissioned by the Federal Government in order to establish a framework for the development the Australian energy sector. Also known as the Finkel Report, it recommends the use of a Clean Energy Target (CET) scheme to stimulate renewable energy production throughout the National Electricity Market (NEM). This would likely replace the present Federal RET scheme due to expire in 2020, and would result in a more technology-neutral allocation of renewable energy generation certificates; any generator producing energy at a level of pollution below a benchmark rate would be eligible as opposed to only specific technologies as with the RET scheme. The report modelled outcomes utilising this type of scheme to achieve the trajectory committed to by the Federal Government by 2030 and determined that renewable energy would constitute approximately 42% of the NEM at this

time. Other policies including an Emissions Intensity Scheme and lifetime limits on coal-powered generation were considered, with the report deeming CET the most effective based on their model.

The Federal Government recently signalled its response to the Finkel Report, which does not include a CET. The Federal Government's proposal is based on a National Energy Guarantee scheme, involving the following main components:

- No subsidies for renewable or any other kind of energy generators
- Power companies will be forced to guarantee on-demand electricity from coal, gas, hydro or batteries that store renewable energy
- Power companies will also be forced to keep carbon dioxide emissions below a certain level, through the purchase of low emissions generated energy.

Implementation of the proposed National Energy Guarantee scheme will likely require Federal parliamentary legislation and will need the agreement of States and Territories.

South Australian Renewable Energy Target

South Australia is the leading jurisdiction in Australia in terms of renewable energy generation, through proactive policy and investment initiatives.

In 2009, the South Australian Government set a renewable energy target of 33% by 2020; however, this target was met six years ahead of schedule in 2014.

In 2014, a new target of 50% by 2025 was set, subject to national renewable energy policy being retained. South Australia exceeded its 50% renewable energy target in 2016, nearly a decade ahead of schedule – with an estimated 53% of energy derived from renewable wind and solar sources at that time.

1.5 Summary

- 1 RES Australia is proposing the construction of a 176 MW Solar Farm just north of the Murray Bridge township in South Australia.
- 2 The solar farm facility will be located across a single property which is 730ha in area.
- 3 The project is in the process of obtaining planning approval from the State Government. Subject to planning approval, it is anticipated construction of the solar farm could start by late 2018 and the facility may be operational by mid-2020.
- 4 In the past 18 months, Federal and State governments have updated long-term renewable energy targets and this should provide greater investment certainly within the sector in the short-term (ie 2020). The National Energy Plan is currently being formulated by the Federal Government and at this stage it is unclear as to the eventual impact on the renewable energy sector, noting the proposed Clean Energy Target (Finkel Report) is unlikely to feature in the Plan. Importantly, South Australia is the national

leader in the provision of renewable energy, with over 50% of the State's electricity generation now derived from wind and solar sources.

- 5 This Economic Impact Assessment 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 Pallamana Solar Farm project.

2 REGIONAL ECONOMIC PROFILE

2.1 Population

The population of the Study Area totalled approximately 64,090 persons as of June 2016 (ABS Estimated Resident Population).

Over the period 2016-2031 population growth in the Study Area is expected to be relatively strong at +1.2% pa (or +12,270 persons over 15 years), which is above the growth rate forecast for South Australia (+0.9% pa) over the period.

Of particular note is the projected population contraction in the Mid Murray Council area of -640 persons over the period, representing a decline in population of -0.5% pa over 15 years.

This projected population decline highlights 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 Pallamana Solar Farm (and the proposed nearby Palmer Solar Farm) will provide alternative drought-proofed, guaranteed income to the host farms for 25 years. In addition the construction and operational phases of these projects will provide an economic stimulus (jobs, project contracts, new spending etc) to small towns and rural settlements in the immediate region.

Population estimates, which are included in Table 2.1, are based on official population forecasts prepared by the State Government (based on the medium growth scenario).

Table 2.1: Population Projections – Study Area, 2016-2036

Area	2016 ¹	2031 ²	Change 2016-31	AAGR 2016-31
Mid Murray (DC)	8,800	8,160	-640	-0.5%
Mount Barker (DC)	33,810	43,560	9,750	1.7%
Murray Bridge (RC)	21,490	24,640	3,150	0.9%
Study Area	64,090	76,360	12,270	1.2%
South Australia	1,713,050	1,936,810	25,170	0.8%

Sources: ¹ABS, 3218.0 Regional Population Growth; Australia; ²South Australian Government (Department of Planning, Transport and Infrastructure) population projections (medium series), 2016 edition

Notes: AAGR = Annual Average Growth Rate
Figures rounded

2.2 Labour Force

As of June 2017 (latest available) the Study Area had an unemployment rate of 7.0%, which is slightly above South Australia's unemployment rate of 6.7%.

As Table 2.2 shows, in June 2017 the Study Area's labour force totalled 33,320 persons, including 2,330 persons who were unemployed.

The Pallamana Solar Farm project is likely to require 200 workers (at peak), with many of these likely to be sourced locally (70% or 140 positions). The project therefore provides new short-term employment opportunities for labour force participants, including existing unemployed persons, subject to appropriate skills match.

These labour supply factors are further explored in Chapter 3.

Table 2.2: Labour Force – Study Area, June 2017

Municipality / Area	Employed No. of Persons	Unemployed No. of Persons	Total No. of Persons	Unemployment Rate
Mid Murray (DC)	3,780	240	4,010	6.0%
Mount Barker (DC)	18,220	1,300	19,530	6.7%
Murray Bridge (RC)	8,990	800	9,790	8.2%
Study Area	30,990	2,330	33,320	7.0%
South Australia	817,200	58,800	876,000	6.7%

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

Note: 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 2016 shows 36.5% of Study Area workers were occupied in activities generally associated with the types of skills required for the construction of a solar farm. These include technicians and trades workers, machinery operators & drivers, and labourers.

The Study Area's representation in these occupations is well above the State average of 30.6%, indicating a generally suitable occupational base for the proposed project.

In total numbers, approximately 10,260 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, 2016

Occupation	Study Area		South Australia
	<i>No.</i>	<i>Share</i>	<i>Share</i>
Professionals	4,260	15.1%	20.3%
Technicians and Trades Workers	4,100	14.6%	13.4%
Managers	3,720	13.2%	12.6%
Clerical and Administrative Workers	3,280	11.7%	13.3%
Labourers	4,350	15.5%	11.1%
Community and Personal Service Workers	3,370	12.0%	12.0%
Sales Workers	2,840	10.1%	9.6%
Machinery Operators and Drivers	1,810	6.4%	6.1%
Inadequately described / not stated	420	1.5%	1.5%
Total	28,160	100.0%	100.0%

Source: ABS Census of Population and Housing 2016

2.4 Business Structure

One of the more tangible benefits of a major investment project, such as the proposed Pallamana 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 approximately 625 construction businesses, plus approximately 205 businesses associated with transport, postal and warehousing services, with these two sectors contributing 830 businesses or 21.4% of all businesses located in the Study Area and this compares to 20.4% for these sectors across South Australia.

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

Table 2.4: Business Structure – Study Area, 2016

Sector	Study Area		South Australia
	No.	%	%
Agriculture, Forestry and Fishing	834	21.4%	12.4%
Mining	23	0.6%	0.4%
Manufacturing	194	5.0%	4.3%
Electricity, Gas, Water and Waste Services	23	0.6%	0.3%
Construction	625	16.1%	14.8%
Wholesale Trade	84	2.2%	2.8%
Retail Trade	282	7.3%	6.1%
Accommodation and Food Services	130	3.3%	4.0%
Transport, Postal and Warehousing	206	5.3%	5.6%
Information Media and Telecommunications	10	0.3%	0.6%
Financial and Insurance Services	223	5.7%	10.5%
Rental, Hiring and Real Estate Services	377	9.7%	11.6%
Professional, Scientific and Technical Services	310	8.0%	9.4%
Administrative and Support Services	122	3.1%	3.4%
Public Administration and Safety	16	0.4%	0.3%
Education and Training	18	0.5%	1.0%
Health Care and Social Assistance	130	3.3%	5.9%
Arts and Recreation Services	42	1.1%	1.0%
Other Services	204	5.2%	4.2%
Industry not classified	36	0.9%	1.3%
Total Business	3,889	100.0%	100.0%

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

2.5 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.

As Table 2.5 highlights, the Adelaide Hills and Murraylands tourism regions (which include Mount Barker, Murray Bridge and Mannum) and provide the ‘best fit’ for the Study Area have a reasonable supply of commercial accommodation as measured by the ABS Tourism Accommodation series for the June Quarter 2016 (latest available).

This data – which identifies supply for hotels, motels and apartments with 15 rooms or more – shows these tourism regions include 12 establishments and approximately 340 rooms and 1,000 beds.

In the June 2016 Quarter, room and bed occupancy rates across the Adelaide Hills and Murraylands tourism regions were approximately 56% and 32% respectively.

These relatively low room and bed occupancy rates in the Study Area indicate 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 2.5: Hotel, Motel and Apartments Accommodation (with 15 Rooms or more) – Adelaide Hills and Murraylands Tourism Regions, June Quarter 2016

Location	Establishments No.	Rooms No.	Beds No.	Room Occupancy Rate	Bed Occupancy Rate %
Adelaide Hills Tourism Region	5	177	520	56%	32%
Murraylands Tourism Region	7	165	480	56%	30%
Study Area	12	342	1,000	56%	31%

Source: ABS Tourism Accommodation, Australia 2015-16 – June Quarter, 2016.

In addition to commercial accommodation outlined above, the Study Area also provides a range of additional low cost options close to the subject site which might be used for project accommodation, including the following:

- Caravan/ Holiday parks providing cabins, such as:
 - White Sands Riverfront Caravan Park, Murray Bridge
 - Murray Bridge Marina Camping and Caravan Park
 - Murray Bridge Tourist Park
 - Avoca Dell Caravan Park, Murray Bridge
 - Mannum Riverside Caravan Park

- Mount Barker Caravan & Tourist Park
- House boats (especially in Mannum)
- Bed and Breakfast
- Guest houses.

Private Accommodation

Private accommodation is often used to support construction worker needs and this could be through the leasing of holiday homes and investment properties, either privately or through real estate agents. ABS Census data for 2016 indicates the Study Area has an above-average level of unoccupied dwellings, especially in the Mid Murray Council area, where almost one in two dwellings (45.4%) or 2,905 dwellings are unoccupied reflecting the high level of holiday homes and tourism associated with the area. Neighbouring Murray Bridge Council has 1,245 unoccupied dwellings, or 13.6% of total dwelling stock.

As Table 2.6 shows, 17.8% of Study Area dwellings were unoccupied at the 2016 Census, and this is well above the average for South Australia of 12.6%.

Shared private housing accommodation is one potential option for the solar farm project workers, and this is further explored in section 3.5.

Table 2.6: Unoccupied Dwellings – Study Area, June 2016

	Occupied Dwellings No.	Unoccupied Dwellings No.	Total Dwellings No.	Unoccupied Dwelling Share
Mid Murray (DC)	3,500	2,905	6,405	45.4%
Mount Barker (DC)	12,010	910	12,920	7.0%
Murray Bridge (RC)	7,925	1,245	9,170	13.6%
Study Area	23,435	5,060	28,495	17.8%
South Australia	638,780	92,240	736,495	12.6%

Source: ABS Census of Population and Housing, 2016

Note: Figures rounded

Township Services

In addition to accommodation, workers temporarily locating 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 settlements and townships in the Study Area, which are likely support the project in some capacity and in doing so, generate economic benefits for their communities. Township services are described in order of proximity to the subject site.

Murray Bridge

Murray Bridge is a major rural town located on the banks of the Murray River, with a population of approximately 17,560 persons (ABS Census 2016). The town is approximately an hour's drive from the Adelaide CBD and is approximately 5km to the south (or a 10 minute drive) from the proposed Pallamana Solar Farm site.

Murray Bridge is the primary activity centres for the mid Murray Region, and provides many of the key services likely to be required to support a major infrastructure project such as the proposed solar farm project.

Murray Bridge's key services include:

- Freight and transport services (Bocca Transport, Gunn Freight)
- Auto mechanics (various)
- Steel fabricators (Jacksons Australia, Southern Steel Supplies, Bridge Building Supplies)
- Construction firms (Mobbs constructions, SPRY Earthmovers, Nigro Earthmovers)
- Concreters
- Engineering services (Moore Engineering, Miegel Engineering, Newell Composites)
- Trade Suppliers (Bunnings, Mitre 10)
- Fuel supplies
- Commercial and private accommodation (see above Tables and commentary)
- Full range of retail services – (2 Coles, 2 Woolworths, BIG W, Target)
- Cafes and restaurants
- Entertainment (hotels, clubs, sports and recreational facilities)
- Major banks and financial institutions
- Real estate agents
- Postal services
- Employment agencies (MADEC, Job Prospects)
- Medical and emergency services including:
 - Murray Bridge Soldiers Memorial Hospital. with a 24 hour emergency department
 - Murray Bridge Ambulance Station
 - SA MFS Fire & Rescue Service
 - Murray Bridge Police Station

- Medical centres and health services.

Images of Murray Bridge are shown in Figure 2.1

Figure 2.1: Images of Murray Bridge



Source: www.google.com

Mannum

Mannum, with a population of approximately 6,180 persons (ABS Census 2016), is a medium sized tourist town which offers a range of services likely to be required during the construction phase.

Mannum is located approximately 25km to the north of the solar farm site, or a 30 minute drive, and has a large amount of existing visitor accommodation (including many house boats) due to its tourist trade, and therefore represents an ideal base for the accommodation of non-local project workers.

Mannum's key services include:

- Auto mechanics (various)
- Fuel supplies (BP, Caltex, Shell)
- Commercial and private accommodation (see above Tables and commentary)
- Retail services - including Mannum Green, Foodland supermarket and speciality stores
- Cafes and restaurants
- Entertainment (hotels, clubs, and recreational facilities)
- Postal services and banks
- Real estate agents (Mannum Real Estate, First National Real Estate, CE Property Group)
- Medical and Hospital services
- Some Freight transport services
- Some engineering and construction services

Images of Mannum are shown in Figure 2.2

Figure 2.2: Images of Mannum



Source: www.google.com

Mount Barker

Mt Barker is a major regional town of approximately 17,370 people (ABS Census 2016) that lies on the eastern side of the Adelaide Hills approximately an hour's drive from the Adelaide CBD. The town is located 35km west of the solar farm site, approximately 30 minutes' drive time. Mount Barker is the main service centre for broader region and provides a full range of key services likely to be required to support a major infrastructure project such as the proposed solar farm.

- Freight and transport services (various)
- Auto mechanics (various)
- Steel fabricators (Mt Barker Steel)
- Construction firms (Mobbs constructions, SPRY Earthmovers, Nigro Earthmovers)
- Concreters
- Engineering services (Steriline Engineering, Unox Engineering, Engineering Options)
- Trade Suppliers (Bunnings, Mitre 10, Tradelink)
- Fuel supplies
- Commercial and private accommodation
- Full range of retail services – (Coles, Woolworths, Foodland, Kmart, BIG W, Target)
- Cafes and restaurants
- Entertainment (hotels, clubs, sports and recreational facilities)
- Major banks and financial institutions
- Real estate agents

- Postal services
- Employment agencies (Maxima, Madec, Jobs Statewide)
- Medical and emergency services including:
 - Mount Barker Districts Soldiers' Memorial Hospital, with a 24 hour emergency department
 - Mount Barker Ambulance Station
 - SA MFS Fire & Rescue Service
 - Mount Barker Police Station
 - Medical centres and health services.

Images of Mount Barker are shown in Figure 2.3

Figure 2.3: Images of Mount Barker



2.6 Conclusions

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

- 1 The Study Area has a resident population of around 64,000 persons (2016), which is expected to reach approximately 76,400 persons by 2031, representing annual growth of 1.2% pa over the period which is higher than the forecast State growth of 0.8% pa over the 15 years. However, the Mid Murray Council area is projected to decline in population at a rate of -0.5% pa over the coming 15 years, and therefore new infrastructure projects which provide local economic stimulus should be welcomed.
- 2 The Study Area currently has an unemployment rate of 7.0%, which is above the unemployment rate for South Australia of 6.7%. The Study Area currently has 2,330 persons who are unemployed. In this regard, construction of the Pallamana Solar Farm 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.

- 3 The Study Area's occupational and business structures indicate a good base exists to service the needs of the solar farm project, including approximately 10,300 construction-related workers (based on occupation) and 830 construction and transport businesses.
- 4 Mount Barker, Murray Bridge and Mannum, given their relatively close proximity to the subject site, will underpin most project needs in view of its supply of commercial accommodation (300+ rooms), trade supplies and transport services, machinery hire and repairs, retail services, emergency services and so on.

3 ECONOMIC IMPACT ASSESSMENT

3.1 Project Investment

The total construction cost for the Pallamana Solar Farm project is estimated to be approximately \$200 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 during construction of the Pallamana Solar Farm, which is expected to occur over a 16-month period. 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:

- Installation 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 nearby Murray Bridge and the major regional centre of Mount Barker. 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 and the like.

Total Construction Employment

In summary, approximately 520 jobs (200 direct jobs and 320 indirect jobs) are expected to be generated by the Pallamana Solar Farm project during the 16-month construction phase.

The amount of local employment required at the peak of the project is estimated by the proponent to be approximately 140 jobs. This represents only 1.4% of the Study Area's labour force who are occupied in construction-related activities (10,260 persons) and therefore this should not present a constraint to labour supply for the project.

Operational Phase

Direct Operational Employment

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

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 it is assumed 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 Pallamana Solar Farm project.

Total Operational Employment

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

3.3 Concurrent Infrastructure Projects and other Activities in the Study Area

The Pallamana Solar Farm project may need to compete for labour and resources with other infrastructure projects that include the Palmer Wind Farm and the Palmer Solar Farm projects (both subject to planning approval) and Council infrastructure works, as well as seasonal agricultural and tourism activities.

However, the relatively small workforce requirement for the project (140 local positions over 16 months) makes it unlikely any project labour supply issues will occur, recognising the significant construction-related labour force available in the Study Area, especially in Murray Bridge and Mount Barker. Additionally, the Study Area currently has 2,330 labour force participants who are unemployed, some of whom may gain project employment (subject to suitable skills match).

3.4 Industry and Business Participation Opportunities

In terms of cost efficiencies (lower transport, equipment hire, 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 625 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, Mount Barker and Murray Bridge have firms of sufficient scale/expertise to compete for contracts or provide services and equipment to the project.

In order to maximise local business participation, a number of strategies might be considered, such as widespread advertising of contract opportunities 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 340 rooms and equivalent to approximately 1,000 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 18% of the Study Area's 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 be choose to be accommodated on House Boats (Mannum), Caravan Parks (cabins), B&Bs, private rentals (holiday homes) or with family or friends – none of these categories are included in the commercial accommodation audit. Additionally, some workers may share motel rooms or cabins to reduce personal costs.

ABS Tourism Accommodation data for the June Quarter 2016 (refer to Table 2.5) shows the Study Area had a room occupancy rate of 56% and a bed occupancy rate of 32% for its hotels, motels and serviced apartments (with 15 rooms or more).

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.

Importantly, the influx of project workers will support higher occupancy rates and revenues for local accommodation operators 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 (on average) over the 16-month construction phase 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 Murray Bridge and Mount Barker (refer to section 2.5). 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 13-14 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 Pallamana Solar Farm on agricultural activity is noted as follows:

- Approximately 730ha of productive farming land might be unusable for agricultural purposes during the lifetime of the solar farm. However, RES are examining the possibility of accommodating continued sheep grazing across part of the site.

- This will affect land used principally for grazing, with the site being extensively grazed over many years.
- ABS Agricultural Commodities for South Australia 2015/16 shows the South Australia – South East region (in which the subject site is located) has 4.3 million hectares of agricultural land; therefore, agricultural land lost to the solar farm project is negligible in a regional context.
- The property owner will be compensated for the loss of this agricultural land through annual lease payments for hosting the solar farm.
- The land can potentially be rehabilitated to its original condition at the end of the project when all above ground infrastructure is removed, allowing agricultural activities to recommence.

3.8 Ongoing Economic Stimulus

As noted, the proponent will pay the landowner annual lease payments to host the Pallamana Solar Farm project. These payments (the details of which are subject to confidentiality) are likely to be significantly above the long-term agricultural returns generated from the land, and in this regard will support the financial sustainability of this particular farming operation.

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 consultant's calculations of new wage spending, the Study Area's economy will receive an estimated stimulus of \$22.9 million over 25 years (adjusted for CPI) through these effects.

3.9 Returns to Council

Council Rates Revenue

Unlike other states (such as Victoria), South Australia does not currently have in place a legislative framework to guide rates payable for electricity generating facilities. Revenues payable to Murray Bridge Council associated with the operation of the Pallamana Solar Farm, therefore, will be subject to negotiation between Council and the operator.

The operator will be liable for Council rates and other taxes, such as the Natural Resource Management Levy (NRML), over the lifetime of the Solar Farm (25 years). Currently the rateable value of the site is in the order of \$8,510 pa which is based on the existing Capital Improved Value (CIV) and estimated NRML payment. Assuming \$8,510 pa is payable by the operator on an annual basis, an estimated \$290,000 would be generated in Council rates over 25 years (includes CPI adjustment).

However, this calculation is based on the existing site CIV. Once the solar farm has been completed it is likely the CIV of the site will increase significantly, resulting in a corresponding uplift in rates and taxes payable to Council.

Community Fund

The proponent is committed to providing a Community Fund associated with the Pallamana Solar Farm facility. The Community Fund could be used to support a range of projects including environmental and local community projects.

3.10 National Grid Supply Benefits

The Pallamana Solar Farm has the potential to provide sufficient renewable energy to support the annual electricity needs of approximately 82,000 South Australian households. This calculation is based on:

- 420,000 MWh per year / by average household energy use of 5,145 kwh (Source: ACIL Allen Consulting, AER electricity distributor data).

The Study Area currently contains approximately 28,500 dwellings (ABS Census 2016); therefore, the Solar Farm has the potential to provide 2.9 times the annual electricity needs of the Study Area, highlighting the importance of the facility from a clean energy generation perspective.

3.11 Environmental Benefits

Once fully-operational, the Pallamana Solar Farm will result in the reduction of an estimated 140,000 tonnes (rounded) 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:

- $420,000 \text{ MWh} \times 0.33372 \text{ tonnes/MWh} = 140,160 \text{ tonnes saved per year}$ (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 50,000 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

In the longer-term, the Pallamana Solar Farm could provide opportunities to attract new visitors to the area, if suitable arrangements can be put in place regarding access to the site.

Potential visitor types include:

- Environmentalists
- Researchers

- Eco-tourists
- School and educational groups.

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

3.13 Conclusions

- 1 The Pallamana Solar Farm project will involve approximately \$200 million in investment during the construction phase and will support 200 direct and 320 indirect positions over the 12-month construction period. Once operational, 4 direct and 12 indirect jobs will be supported by the facility.
- 2 Accessing adequate labour supply should not present a major issue for the project, noting the peak local employment requirement for the project (140 workers) represents only 1% of workers occupied in construction-related activities in the Study Area (10,260 workers).
- 3 The project will provide significant participation opportunities for businesses and workers located in the Study Area, having regard for the good match of skills and resources available. In this regard, the proponent and organisations such as the Industry Capability Network might be involved in ensuring maximum local inputs are secured.
- 4 The 'external' project labour requirement is expected to generate an accommodation need for 60 project workers at the peak of the project. This represents 18% of total commercial accommodation rooms (hotels and motels) in the Study Area and would provide a boost to local accommodation operators, noting room occupancy rates were just 56% during the June Quarter, 2016. Other providers such as houseboat owners, caravan parks operators etc may also benefit in terms of increased accommodation revenues.
- 5 Construction workers are expected to inject approximately \$2.7 million in additional spending into the regional economy over the construction phase, supporting around 13-14 jobs in the service sector in the Study Area.
- 6 Approximately 730ha of productive agricultural land will be lost to accommodate the solar farm. However, this is negligible in a regional context (4.3 million ha of agricultural land exist) and noting the land can potentially be used for agricultural purposes at the end of the solar farm's lifecycle.
- 7 Ongoing economic stimulus associated with new local wage spending and returns to the host landowner are estimated at \$22.9 million over 25 years (adjusted for CPI).
- 8 Council rates revenue associated with the solar farm will be subject to negotiations between Murray Bridge Council and the operator (who will be responsible for payments). Rates revenue to Council is estimated at \$290,000 over the 25-year project lifecycle (including CPI adjustment) based on the exiting Capital Improved Value (CIV) of

the site. However, the site's CIV will increase significantly through the development of the solar farm, and a corresponding uplift in Council rates can be expected.

- 9 The proposed Community Fund can be directed to new community infrastructure and programs.
- 10 The project has the capacity to supply sufficient clean energy to power approximately 82,000 homes and, in the process, to reduce CO2 emissions by 140,000 tonnes per year.
- 11 Once operational, the Pallamana Solar Farm will present a new environmental experience for the region, which could potentially support small-scale tourism and educational opportunities in the future.