



ESSENTIAL ECONOMICS

Carisbrook Solar Farm Project

Economic Impact Assessment

FINAL REPORT

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lb vogt GmbH

by

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EXECUTIVE SUMMARY

Ib vogt GmbH have commissioned Essential Economics Pty Ltd to prepare an Economic Impact Assessment for the proposed 90 Mega Watt (MW) DC / 74 MW AC Carisbrook Solar Farm (the Project) which will be located approximately 6 kms east of Carisbrook in central Victoria.

The solar farm will be located across a 300 hectare (ha) 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 (which includes the Local Government Areas of Ballarat, Bendigo, Mount Alexander, Hepburn and Central Goldfields) has a resident population of approximately 267,000 persons (2017), which is expected to reach approximately 315,000 persons by 2031 representing a modest annual growth rate of 1.2% over the period. However, outside the major regional cities of Ballarat and Bendigo, population growth is forecast to be modest, especially in Central Goldfields Shire (in which the project will be located) where no growth is forecast over the period. Major projects, such as the proposed Carisbrook Solar Farm, which stimulate new investment and jobs locally should therefore be encouraged.
- 2 Central Goldfields Shire is the most disadvantaged municipality in Victoria based on ABS SEIFA data for 2016. This factor highlights the need for new investment, jobs and economic stimulus to support the local economy.
- 3 The Study Area has an unemployment rate of 6.0% (7,730 persons unemployed), which is above both the regional Victoria and State unemployment rates of 5.3% and 5.8% respectively. Central Goldfields Shire has an unemployment rate of 7.8% (415 persons unemployed), which is significantly higher compared to regional and State averages. In this regard construction of the Carisbrook Solar Farm provides new short-term employment opportunities for the local/regional labour force participants, with a small amount of ongoing employment also supported once the facility is operational.
- 4 The Study Area's occupational and business structures indicate a good base exists to service the needs of the solar farm project, including approximately 35,400 construction-related workers (based on occupation) and approximately 4,900 construction and transport businesses. Locally, Central Goldfields Shire includes approximately 1,800 construction-related workers and 170 construction and transport businesses.
- 5 The major regional cities of Ballarat and Bendigo have the capacity and labour force to support many aspects of the Project, including some specialist roles. Locally, the Maryborough/Carisbrook townships given their close proximity to the subject site are likely to play a significant role in the Project through labour supply, accommodation provision, selected construction services, retail, and food & beverage services.

Economic Impact Assessment

- 6 The Carisbrook Solar Farm project will involve approximately \$100 million in investment during the construction phase and will support 240 direct and 380 indirect positions over the 7-9 month construction period. Once operational, 5 direct and 15 indirect jobs will be supported by the facility.
- 7 Accessing adequate labour supply should not present an issue for the Project, noting the local employment requirement for the Project (140 jobs) represents less than 1% of workers occupied in construction-related activities in the Study Area (35,410 workers) and 8% of local workers occupied in these activities (1,800 workers).
- 8 The only approved infrastructure project in the immediate area that may be constructed at the same time as the solar farm is the Strathlea chicken broiler facility; however, this project is unlikely to impact on labour and resources required to support the Carisbrook Solar Farm project given its relatively small scale.
- 9 The Project will provide significant participation opportunities for businesses and workers located in the Study Area and locally, noting the good match of skills and resources available. In this regard, the proponent has already started engaging with potential suppliers to ensure as much local resources are used for the Project as is practicable.
- 10 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 less than 3% of total commercial accommodation rooms in the Study Area. Locally, accommodation providers in Central Goldfields Shire (especially in Carisbrook and Maryborough) will benefit significantly from this demand for accommodation given their close proximity to the subject site. This would provide a boost for the local accommodation sector, noting relatively low existing room occupancy rates, and also provide increased opportunities for private property owners in the rental market.
- 11 Construction workers would be expected to inject approximately \$430,000 in additional spending into the local economy over the construction phase, supporting businesses and employment in Carisbrook, Maryborough and other townships in the Central Goldfields Shire.
- 12 Approximately 300ha of productive agricultural land (cropping and grazing) will temporarily be lost to accommodate the solar farm. However, this represents only 0.02% of all productive farming land supply in the North Central NRM Region with the proponent looking to continue grazing on the site, under and around the solar structure potentially reducing the amount of land lost to the Project. Importantly, the host landowners will improve their annual incomes, as operator payments will be greater than existing farm incomes from these landholdings and the land can be returned to farming activities at the end of the solar farms lifecycle.
- 13 Ongoing economic stimulus associated with financial returns to Council (in lieu of rates), returns to host landowners and new wage spending is estimated at \$28.7 million over 25 years (adjusted for CPI @ 2.5% pa).

- 14 The Project has the capacity to supply sufficient clean energy to power approximately 44,000 homes and in the process reduce CO₂ emissions by 168,000 tonnes per year.
- 15 Once operational, the Carisbrook Solar Farm could potentially support small-scale tourism and educational opportunities in the future.

INTRODUCTION

Background

Ib vogt GmbH have commissioned Essential Economics Pty Ltd to prepare an Economic Impact Assessment for the proposed Carisbrook Solar Farm (the Project) to be located approximately 6 kms east of Carisbrook and 13km east of Maryborough in central Victoria.

The proposed development will be situated on a 300ha site which involves three landholdings. The solar farm will have an installed capacity of 90 MW (DC) powered by up to approximately 250,000 photovoltaics panels. The Project will have a rated capacity of 74 MW (AC).

Subject to planning approval and financing, construction of the Carisbrook Solar Farm is anticipated to start in mid-2019 with the facility fully operational by mid-2020. The relevant planning authority for this project is Central Goldfields Shire.

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 the Study Area.
- Chapter 2: **Regional Economic Profile**
Presents an overview of population, relative disadvantage, labour force, occupational structure, business structure and township services, including an audit of available commercial accommodation in the Study Area and locally.
- 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, cumulative impacts, local economic stimulus, financial returns to Council and environmental benefits.

1 PROJECT CONTEXT

1.1 Site Location

The proposed Carisbrook Solar Farm will be developed on a site in located in central Victoria which is well connected to a number of major regional centres and towns, which are listed below (in order of population):

- Ballarat – major regional city located approximately a 60-minutes’ drive to the south of the subject site
- Bendigo – major regional city located approximately 60 minutes’ drive to the north-east of the subject site
- Castlemaine – large township located approximately 30 minutes’ drive to the east of the subject site
- Daylesford – large township located approximately 45 minutes’ drive to the south-east of the subject site
- Maryborough – large township located approximately 15 minutes’ drive to the west of the subject site
- Clunes – small township located approximately 30 minutes’ drive to the south of the subject site
- Maldon – small township located approximately 30 minutes’ drive to the north-east of the subject site
- Carisbrook – small township located approximately 5-10 minutes’ drive to the west of the subject site
- Dunolly – small township located approximately 25 minutes’ drive to the north-west of the subject site
- Talbot – small township located approximately 20 minutes’ drive to the south-west of the subject site
- Baringhup – small township located approximately 5 minutes’ drive to the east of the subject site

These regional centres and townships, to differing extents, are likely to play important roles in supporting the requirements of the Project, including local townships such as Maryborough and Carisbrook.

The subject site comprises three separate landholding which are approximately 300ha in size combined. The land is currently used for farming purposes under the Farming Zone (FZ). It is estimated that 70% of the site (210ha) will be utilised for solar farm infrastructure and operations.

Existing farming activities include the following:

- Landholding 1: Approximately 24ha of land, which is mostly cropped with barley
- Landholding 2: Approximately 81ha of land mainly used for sheep grazing (meat), with some land set aside for commercial timber (red gum /spotted gum and iron bark. Note, these plantations have proven to be commercially unviable (mainly due to drought) and will be removed as part of the Project.
- Landholding 3: Approximately 190ha of land which is split approximately 50% for barley crops and 50% for sheep grazing (Mourinho sheep – wool production). The host land also includes a failed timber plantation which will be removed as part of the Project.

The Carisbrook Solar Farm requires planning approval from Central Goldfields Shire in the form of a planning permit under the *Planning and Environment Act 1987*.

Based on preliminary investigations and requirements under Clause 52.42 of the State Planning Policy Framework, the following matters will be assessed for the Carisbrook Solar Farm:

- Biodiversity.
- Post-contact and Aboriginal cultural heritage.
- Visual amenity and landscape character.
- Flooding and drainage
- Noise.
- Land use and resources.

The final design of the proposal would aim to avoid or minimize impacts to the environment and surrounding sensitive uses.

The above investigations will inform the final planning permit application to be lodged with the Council.

1.2 Project Description

The Project will consist of a Solar Photovoltaics (PV) facility of up to 90 MW (DC), including 250,000 PV panels mounted on tracker racks. The PV modules for a tracker array are generally arranged north to south, with the panels tilting around a centre rail to follow the sun's trajectory throughout the day.

Inverters which convert the energy generated by the solar panels into alternating current (AC) for input into the electrical grid, will be contained in shipping containers. The units will be approximately 12 metres (m) in length, 2.5m in width and 2.6m in height. Up to twenty-seven such containers will be located throughout the site and will be identified on the plans provided with the planning permit application.

Next to the inverters will be another unit, which also resembles a shipping container which will contain battery packs and DC/DC converters. The battery units will add flexibility to the solar farm in terms of the way it manages the timing of power distribution. The battery container and DC/DC Converter housing will be approximately 16.2m long and 2.4m wide and will have a height of 2.6m. There will also be up to twenty-seven of these units at the site.

The substation will be located in the north west corner of the development, adjacent to the proposed connection point.

The site is proposed to be connected to the grid via the adjacent BETS - MRO 66 kV powerline located in Bald Hill Road, along the north western boundary of the site.

It is anticipated the solar farm will interconnect directly into this infrastructure.

Powercor is the electrical distributor for this area.

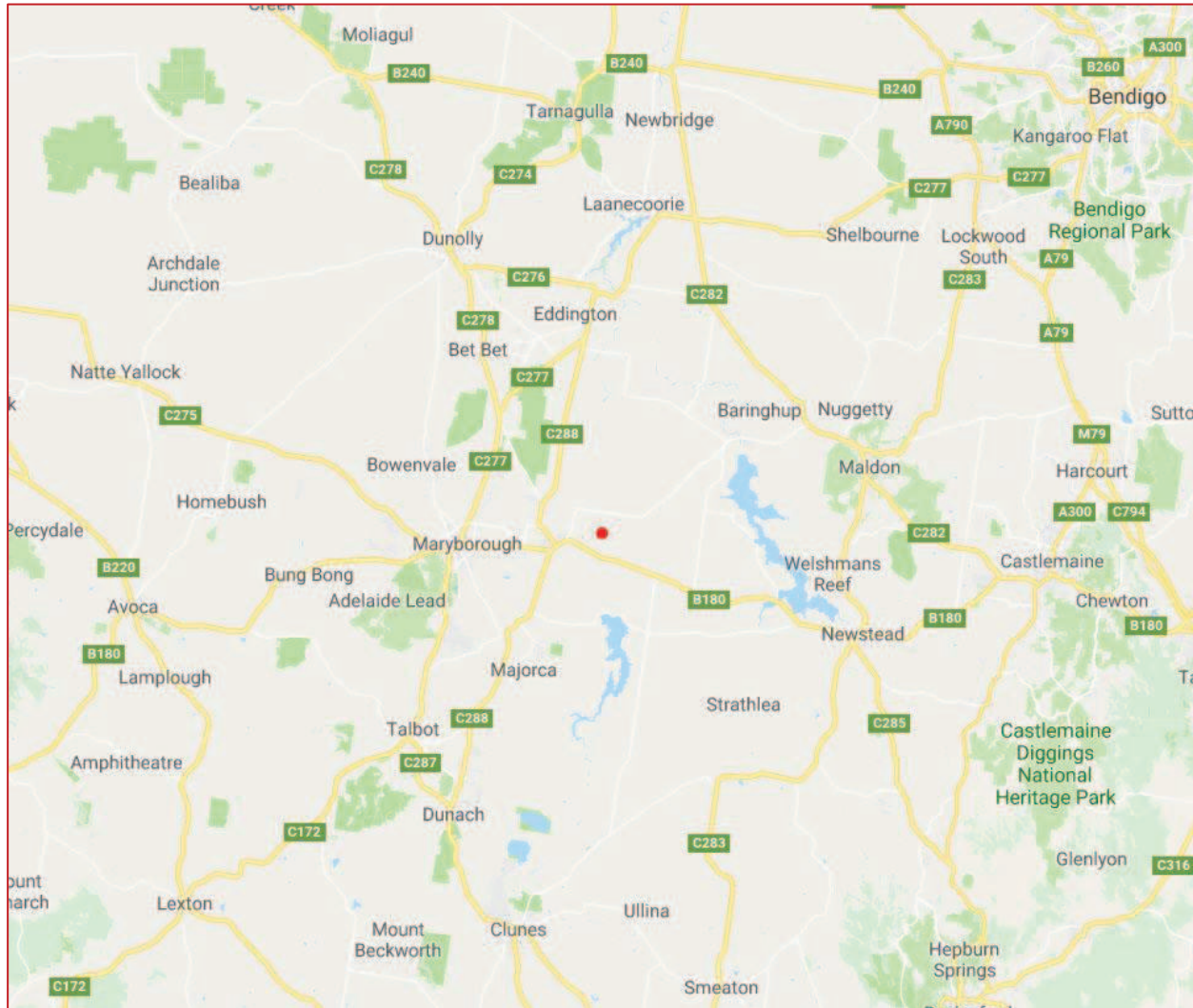
The BETS-MRO 66 kV sub transmission line runs for approximately 65 km between the Maryborough Zone Substation and the Bendigo Terminal Station.

Other site infrastructure will include access roads, site office, vehicle parking, access tracks and perimeter fencing.

Where feasible, the proponent is looking for ways to provide for continued sheep grazing on the site beneath and around the solar structure.

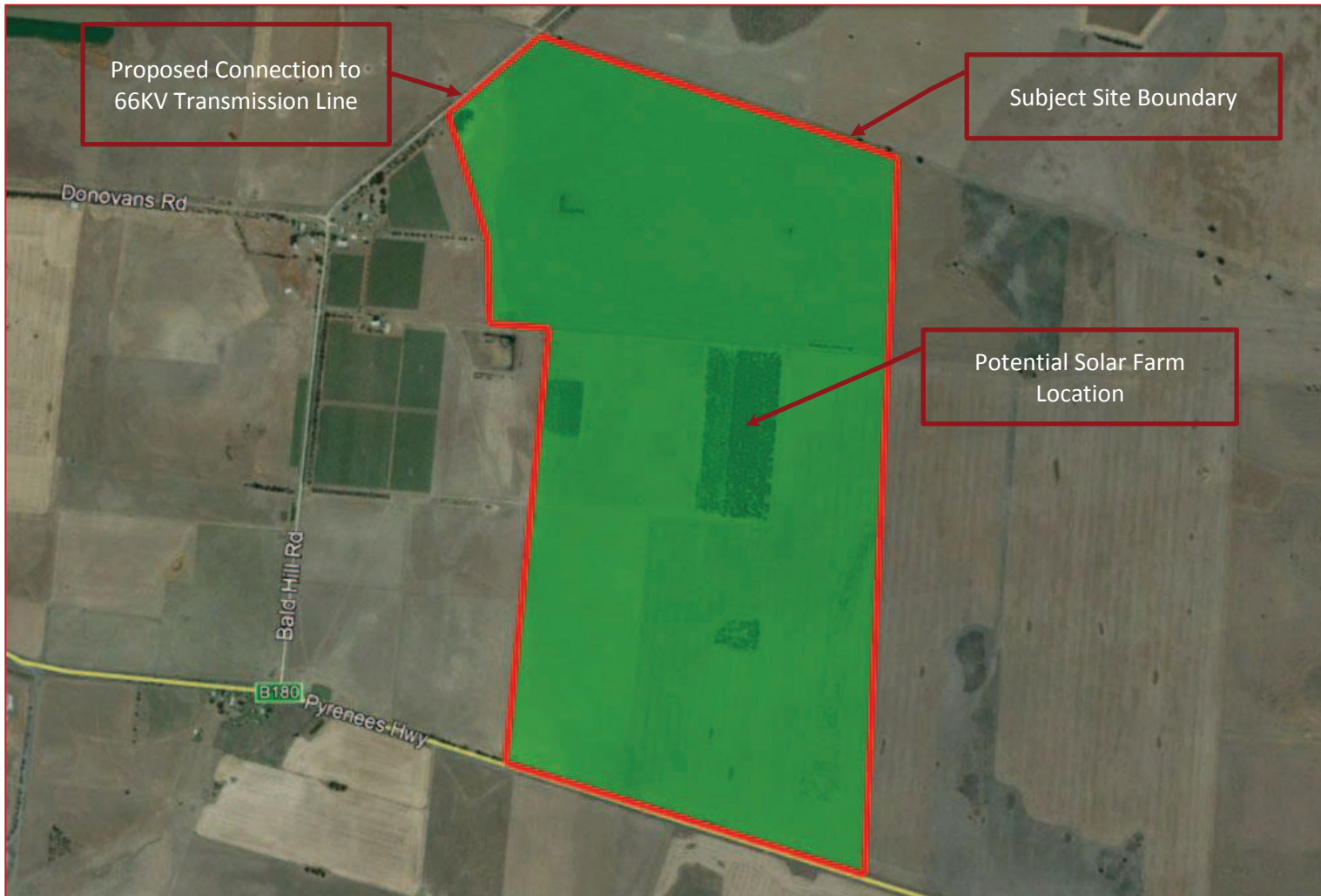
The Carisbrook Solar Farm location is outlined in Figure 1.1 and the preliminary site layout is shown in Figure 1.2.

Figure 1.1: Carisbrook Solar Farm – Site Location



Source: <https://carisbrooksolarfarm.com.au/the-project>

Figure 1.2: Carisbrook Solar Farm – Preliminary Site Layout



Source: <https://carisbrooksolarfarm.com.au/the-project>

1.3 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 percent 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's response to the Finkel Report does not include a CET. Rather, the Federal Government's proposal is based on a National Energy Guarantee (NEG) 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 NEG scheme will likely require Federal parliamentary legislation and will also need the agreement of States and Territories.

Victoria

In June 2016, the Victorian Government announced new renewable energy targets (VRET) for the state of 25 per cent by 2020, and 40 per cent by 2025, to help combat greenhouse emissions. These targets are more ambitious than the government's previous target of 20 per cent renewable energy by 2020, with the government estimating the need for 5,400 MW of new renewable energy capacity across the state to achieve the new targets.

A competitive auction process is being used to help Victoria reach these targets. Through this process, renewable energy developers bid for the long-term government contracts which will assist in making their projects viable.

The 2017 Victorian Renewable Energy Auction Scheme (VREAS) will award commercial contracts of 650MW through a Request for Proposal process (now closed). A reverse auction approach has been used by the government, with bids for up to 550MW for large scale technology neutral renewable energy (including wind farms) and for up to 100 MW of large scale solar-specific renewable energy sought. Successful bidders to the 2017 VRET will be announced by the end of 2018.

1.4 Study Area

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

- City of Greater Bendigo
- City of Ballarat
- Mount Alexander Shire
- Hepburn Shire
- Central Goldfields Shire (in which the subject site is located)

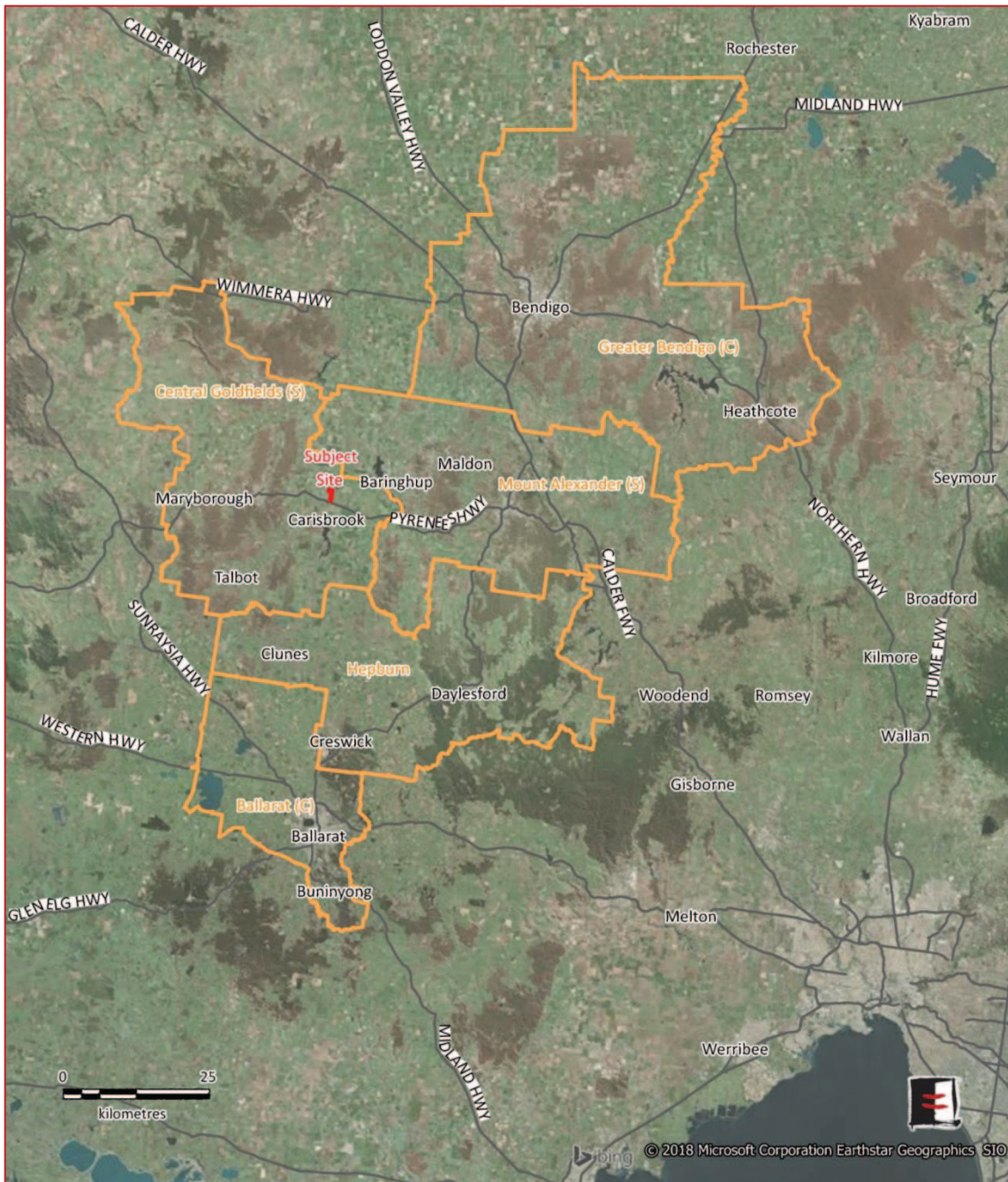
The main regional cities/townships/settlements in these LGAs are all located within an hours' drive of the subject site, which generally represents a realistic commutable limit for project workers.

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.

The local area is defined as the Central Goldfields Shire and is referred to throughout this report when highlighting specific local impacts and opportunities.

Figure 1.3: Carisbrook Solar Farm – Study Area



Source: Essential Economics

1.5 Summary

- 1 Ib vogt GmbH is proposing the construction of the 90 MW Carisbrook Solar Farm located approximately 6 kms east of Carisbrook and 13km east of Maryborough in central Victoria.
- 2 The solar farm facility will be located across three landholdings covering 300ha property, with a development area of 210ha.
- 3 Subject to planning approval and financing, it is anticipated construction of the solar farm could start in mid-2019, and the facility may be operational by mid-2020.
- 4 In recent years, 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 (i.e. 2020). However, 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. In Victoria, the State Government has introduced the VRET (40% renewable energy target by 2025) supported by the VRET 2017 auction which aims to underpin 650 MW of new renewable energy through commercial contracts between the sector (supplier) and the State Government (customer).
- 5 This economic impact study will provide an understanding of potential economic benefits arising for local and regional economies and communities through the construction and operational stages of the Carisbrook Solar Farm project.

2 REGIONAL ECONOMIC PROFILE

2.1 Population

The population of the Study Area totalled approximately 266,860 persons as of June 2017 (ABS Estimated Resident Population).

Over the period 2017-2031, annual population growth in the Study Area is expected to be below average at +1.2% pa (or +68,180 persons over 14 years) compared to the Victorian growth rate of 1.4% pa over the period. These estimates, which are shown in Table 2.1, are based on official population forecasts prepared by the Victorian Government.

Population growth in the Study Area is underpinned by the Bendigo and Ballarat municipalities whose populations are forecast to increase by +31,010 persons and +31,540 persons respectively over 14-year period.

In contrast, the mainly rural municipalities of Mount Alexander Shire, Central Goldfields Shire and Hepburn Shire are forecast to experience very low annual population growth rates (0.3%, 0.0% and 0.4% respectively) between 2017 and 2031. These population projections, especially in relation to Central Goldfields Shire which is forecast to experience no population growth over the period, 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 Carisbrook Solar Farm will provide an alternative drought-proofed, guaranteed income to the host farms for 25 years (with an option of a further 5 years); while the construction and operational phases of the Project will provide an economic stimulus (jobs, project contracts, new spending etc) for local/regional economies, including small towns and rural settlements in these shires, including Carisbrook and Maryborough.

Table 2.1: Population – Study Area, 2017-2031

Municipality	2017 ¹	2031 ²	Change 2017-31	AAGR 2017-31
City of Bendigo	113,620	144,630	31,010	1.7%
City of Ballarat	105,330	136,870	31,540	1.9%
Mount Alexander Shire	19,170	19,970	800	0.3%
Hepburn Shire	15,670	16,480	810	0.4%
Central Goldfields Shire	13,070	13,090	10	0.0%
Study Area	266,860	314,560	64,180	1.2%
Victoria	6,323,610	7,733,280	1,409,670	1.4%

Source: ¹ABS, 3218.0 Regional Population Growth, Australia; ²Victoria in Future 2016, Department of Environment, Water, Land and Planning.

Notes: AAGR = Annual Average Growth Rate
Figures rounded

2.2 Relative Disadvantage

Every five years the ABS prepare a series of indices relating to the social advantage and disadvantage status for each municipality in Australia. These indicators are known as Socio-Economic Indexes for Area (SEIFA) and are based on data compiled from the Census of Population and Housing. The Index of Relative Socio-Economic Disadvantage is a broad measure of disadvantage based on 16 input variables including low household incomes, jobless parents with dependent children, dwellings without internet access etc.

SEIFA data 2016 (refer to Table 2.2) shows Central Goldfields Shire is the most disadvantaged of all Victoria’s 79 LGAs. This data highlights the need for investment projects which provide short and long-term economic stimulus for the community which is explored in Chapter 3.

Table 2.2: ABS SEIFA Index of Disadvantage – Selected LGAs, 2016

LGA	2016	
	Disadvantage Ranking 1 to 79 (Victorian LGAs)	Decile 1 to 10
Central Goldfields Shire	1	1
City of Ballarat	29	4
City of Bendigo	31	4
Mount Alexander Shire	42	6
Hepburn Shire	44	6

Source: ABS SEIFA Indices, 2016

2.3 Labour Force

As of March 2018 (latest available) the Study Area had an unemployment rate of 6.0% which is above both the regional Victorian unemployment rate of 5.3% and the Victorian unemployment rate of 5.8%.

Unemployment rates are very high in the City of Bendigo (7.5%) and in Central Goldfields Shire (7.8%), where the subject site is located.

As Table 2.3 shows, in March 2018 the Study Area’s labour force totalled 127,840 persons, including 7,730 persons who are unemployed. Locally, Central Goldfields Shire has a labour force of 5,330 person including 415 persons who are unemployed.

The Carisbrook Solar Farm project is likely to require 150 workers (at peak) and support 240 jobs in total over a 7-9 month period, with some of these workers being sourced from outside the Study Area (e.g. management, specialists).

In the context of the Study Area’s large labour market and the number of job seekers currently unemployed, the Carisbrook Solar Farm project is unlikely to cause labour supply issues, rather provide new short-term opportunities for labour force participants, especially locals including existing unemployed persons (subject to appropriate skills match).

It is recognised; however, that parts of the Study Area are reliant on the agricultural sector and that significant labour resources are required on a seasonal basis for harvesting and related activities. Additionally, other infrastructure projects may be developed at the same time as the construction of the Carisbrook 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 2.3: Labour Force – Study Area, March 2018

Municipality / Area	Employed	Unemployed	Total Labour Force	Unemployment Rate
City of Ballarat	50,770	2,550	53,320	4.8%
City of Bendigo	48,970	3,995	52,960	7.5%
Mount Alexander Shire	7,920	505	8,430	6.0%
Hepburn Shire	7,540	260	7,800	3.3%
Central Goldfields Shire	4,910	415	5,330	7.8%
Study Area	120,110	7,730	127,840	6.0%
Regional Victoria	708,800	39,900	748,700	5.3%
Victoria	3,227,200	199,700	3,426,900	5.8%

Source: Australian Government Department of Employment, *Small Area Labour Markets – March Quarter 2018*
Figures rounded

2.4 Occupational Structure

The skills base of the Study Area is reflected in its occupational structure, as shown in Table 2.4. ABS Census data for 2016 shows 32% of Study Area workers were occupied in activities generally associated with the types of skills required for the construction of a solar farm (i.e. 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%, indicating a generally suitable occupational base for the proposed project.

In total numbers, approximately 35,410 workers in the Study Area are occupied in construction-related activities highlighting the strong worker base available to support the Project.

At a local level, Central Goldfields Shire contains 1,800 workers occupied in construction-related activities which represents 41% of the total workforce indicating a particularly strong and relevant labour force structure exists locally from which the solar farm project can source workers.

Table 2.4: Occupational Structure – Study Area, 2016

Occupational Type	City of Ballarat		City of Bendigo		Mount Alexander Shire		Hepburn Shire		Central Goldfields Shire		Study Area		Victoria
	No.	Share	No.	Share	No.	Share	No.	Share	No.	Share	No.	Share	Share
Managers	4,848	10.8%	5,349	11.0%	1,081	14.3%	1,077	17.0%	538	12.40%	12,893	11.5%	13.5%
Labourers	4,621	10.3%	5,758	11.8%	993	13.1%	749	11.8%	774	17.80%	12,895	11.6%	9.0%
Technicians and Trades Workers	6,440	14.4%	7,064	14.5%	1,042	13.8%	1,005	15.8%	725	16.60%	16,276	14.6%	13.1%
Professionals	9,735	21.8%	9,794	20.1%	1,798	23.8%	1,213	19.1%	491	11.30%	23,031	20.6%	23.3%
Clerical and Administrative Workers	5,618	12.6%	6,033	12.4%	728	9.6%	681	10.7%	403	9.30%	13,463	12.1%	13.3%
Community and Personal Service Workers	5,615	12.6%	5,904	12.1%	869	11.5%	772	12.2%	557	12.80%	13,717	12.3%	10.6%
Machinery Operators and Drivers	2,345	5.2%	2,947	6.1%	344	4.6%	303	4.8%	300	6.90%	6,239	5.6%	5.8%
Sales Workers	4,795	10.7%	5,100	10.5%	583	7.7%	452	7.1%	491	11.30%	11,421	10.2%	9.7%
Not stated /inadequately described	705	1.6%	720	1.5%	120	1.6%	95	1.5%	70	1.60%	1,710	1.5%	1.7%
Total	44,722	100.00%	48,669	100.00%	7,558	100.00%	6,347	100.00%	4,349	100.00%	111,645	100.00%	100.00%

Source: ABS Census of Population and Housing 2016

2.5 Business Structure

One of the more tangible benefits of a major investment project, such as the proposed Carisbrook 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 2017 (latest available) shows the Study Area includes 3,840 construction businesses and a further 1,060 businesses associated with transport, postal and warehousing service, with these two sectors contributing 4,900 businesses or 25% of all businesses located in the Study Area.

At a local level, Central Goldfields Shire contains approximately 170 construction-related businesses, which represents 1 in 5 of all businesses located in the Shire.

This data, which is included in Table 2.5, indicates a strong presence in the Study Area/locally 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, 2017

Industry Sector	City of Ballarat		City of Bendigo		Mount Alexander Shire		Hepburn Shire		Central Goldfields Shire		Study Area	
	No.	Share	No.	Share	No.	Share	No.	Share	No.	Share	No.	Share
Agriculture, Forestry and Fishing	450	5.4%	608	7.8%	231	15.4%	307	20.7%	192	23.7%	1,788	9.0%
Mining	22	0.3%	35	0.4%	6	0.4%	7	0.5%	3	0.4%	73	0.4%
Manufacturing	352	4.2%	333	4.3%	82	5.5%	56	3.8%	51	6.3%	874	4.4%
Electricity, Gas, Water and Waste Services	13	0.2%	26	0.3%	7	0.5%	3	0.2%	6	0.7%	55	0.3%
Construction	1,599	19.2%	1,648	21.2%	245	16.3%	237	16.0%	115	14.2%	3,844	19.3%
Wholesale Trade	225	2.7%	220	2.8%	43	2.9%	45	3.0%	23	2.8%	556	2.8%
Retail Trade	509	6.1%	579	7.4%	131	8.7%	96	6.5%	56	6.9%	1,371	6.9%
Accommodation and Food Services	405	4.9%	383	4.9%	73	4.9%	110	7.4%	52	6.4%	1,023	5.1%
Transport, Postal and Warehousing	421	5.0%	453	5.8%	64	4.3%	68	4.6%	53	6.5%	1,059	5.3%
Information Media and Telecommunications	60	0.7%	52	0.7%	18	1.2%	17	1.1%	4	0.5%	151	0.8%
Financial and Insurance Services	998	12.0%	619	8.0%	73	4.9%	67	4.5%	41	5.1%	1,798	9.0%
Rental, Hiring and Real Estate Services	914	11.0%	709	9.1%	106	7.1%	101	6.8%	50	6.2%	1,880	9.4%
Professional, Scientific and Technical Services	790	9.5%	720	9.3%	195	13.0%	164	11.1%	44	5.4%	1,913	9.6%
Administrative and Support Services	245	2.9%	199	2.6%	33	2.2%	39	2.6%	18	2.2%	534	2.7%
Public Administration and Safety	16	0.2%	29	0.4%	3	0.2%	3	0.2%	3	0.4%	54	0.3%
Education and Training	93	1.1%	106	1.4%	19	1.3%	16	1.1%	14	1.7%	248	1.2%
Health Care and Social Assistance	616	7.4%	493	6.3%	60	4.0%	56	3.8%	32	4.0%	1,257	6.3%
Arts and Recreation Services	118	1.4%	81	1.0%	43	2.9%	27	1.8%	13	1.6%	282	1.4%
Other Services	395	4.7%	413	5.3%	62	4.1%	50	3.4%	36	4.4%	956	4.8%
Industry not classified	99	1.2%	72	0.9%	9	0.6%	12	0.8%	4	0.5%	196	1.0%
Total	8,340	100.0%	7,778	100.0%	1,503	100.0%	1,481	100.0%	810	100.0%	19,912	100.0%

Source: ABS Counts of Australian Businesses, including Entries and Exits, June 2013 to June 2017

2.6 Township Services Capacity

Commercial Accommodation

The ability to accommodate non-local workers (i.e. 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 (e.g. harvesting). Concurrent infrastructure projects also need to be considered when assessing the adequacy of accommodation for a particular construction project (refer to section 3.3).

As Table 2.6 highlights, the Study Area has a good supply of commercial accommodation as measured by the ABS Tourism Accommodation series for March Quarter 2016 (latest available). This data, which identifies supply for hotels, motels and apartments with 15 rooms or more for the Bendigo-Loddon, Spa Country and Ballarat Tourism Regions (which broadly reflects the Study Area), shows the Study Area contained 71 establishments and 2,290 rooms as of March 2016.

Room occupancy rates in the Study Area (56%) can be considered below average compared to the Victorian average room occupancy rate of 68%, indicating the solar farm project will boost the commercial accommodation sector, especially during off-peak periods.

At a local level a detailed review of the ABS Tourism Accommodation data shows establishments in Maryborough had a combined room occupancy rate of 54% in the March Quarter 2016 (which includes the peak holiday season). These relatively low occupancy rates highlight new hosting opportunities for these facilities arising from the Carisbrook Solar Farm project.

Accommodation requirements and impacts associated with the Project are further discussed in section 3.5.

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

	No. of Establishments	No. of Rooms	Room Nights Available	Room Nights Occupied	Room Occupancy Rate
Bendigo-Loddon TR	35	1,050	95,460	60,620	64%
Spa Country TR	6	280	25,390	12,460	49%
Ballarat TR	30	960	87,180	43,250	50%
Study Area	71	2,290	208,030	116,330	56%
Victoria	849	48,040	4,334,890	2,969,150	68%

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 options close to the subject site (i.e. within a 30-minute drive):

- Caravan/ Holiday parks providing cabins, such as:

- Loddon House Holiday Park, Baringhup
 - Maryborough Caravan Park, Maryborough
 - Golden Country Motel, Cabins & Caravan Park, Maryborough
 - Maldon Caravan and Camping Park, Maldon
 - Castlemaine Central Cabin and Van Park, Castlemaine
 - Castlemaine Gardens Caravan Park, Castlemaine
- Bed and Breakfast facilities
 - Airbnb
 - Guest houses
 - Pubs/hotels

It can reasonably be expected that facilities located in and around Maryborough (such as the two caravan parks) would be especially popular with project workers given their close proximity to the subject site.

Private Accommodation

Private accommodation is often used to support construction worker needs (shared accommodation), 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. As Table 2.7 shows, 13.2% of Study Area dwellings were unoccupied at the Census, which above the average for Victoria (11.7%).

At a local level, 845 properties are unoccupied in Central Goldfields Shire, presenting rental opportunities for some of these homeowners especially those with properties close to the subject site e.g. Carisbrook, Maryborough.

Table 2.7: Unoccupied Dwellings – Study Area, June 2016

	Occupied Dwellings	Unoccupied Dwellings	Total Dwellings	Unoccupied Dwelling Share
City of Bendigo	41,360	5,015	46,375	10.8%
City of Ballarat	38,445	4,505	42,950	10.5%
Mount Alexander Shire	7,375	1,350	8,725	15.5%
Hepburn Shire	6,024	2,032	8,056	25.2%
Central Goldfields Shire	5,455	845	6,300	13.4%
Study Area	98,659	13,747	104,350	13.2%
Victoria	2,112,700	278,630	2,391,300	11.7%

Source: ABS Census of Population and Housing, 2016

Township Services

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

The following sections provide an overview of the services located in the regional centres and main townships in the Study Area (in order of population size) – Ballarat, Bendigo, Castlemaine, Maryborough and Carisbrook.

Other townships in the Study Area such as Baringhup, Clunes, Daylesford, Dunolly, Majorca, Maldon, Talbot also have potential to provide services to the Project, principally by way of accommodation provision and labour supply.

Ballarat

Ballarat, with a population of approximately 100,000 persons, is one of Victoria's largest cities and as such provides an extensive range of services required to support a major infrastructure project such as the proposed solar farm. Ballarat is located approximately 70km south of the subject site, or a 60-minute drive mainly along the Ballarat-Maryborough Road. Ballarat's key services include:

- Construction firms (Eureka Concrete, Boral Concrete, Coates Hire)
- Trade Suppliers (Bunnings Warehouse, Mitre 10, Dahlsens, Home Timber & Hardware)
- Freight and transport services (numerous)
- Wide range of auto mechanics
- Engineering services (numerous)
- All major fuel suppliers
- Commercial and private accommodation (see above Tables)
- Significant retail services - including major shopping centres and department stores
- Wide range of cafes and restaurants
- Entertainment (hotels, clubs, sports and recreational facilities)
- All major banks and financial institutions (Bendigo Bank and Commonwealth Bank)
- Real estate agents (numerous)
- Employment agencies (Western District Employment Access, Simpsons, Workforce International)
- Medical and emergency services including two major hospitals (Ballarat Base Hospital and St John of God Hospital), both with 24-hour emergency departments.

Bendigo

Bendigo has a population of approximately 95,000 persons, and like Ballarat, provides considerable support services for major infrastructure projects. Bendigo is located approximately 70km north-west of the subject site, or a 60-minute drive via Bendigo-Maryborough Road and Carisbrook-Eddington Road. Bendigo's key services include:

- Construction firms (Boral Concrete, Mawsons Concrete, Bendigo Hire, Coates Hire)
- Trade Suppliers (Bunnings Warehouse, Mitre 10)
- Freight and transport services (numerous)
- Wide range of auto mechanics
- Engineering services (numerous)
- All major fuel suppliers
- Commercial and private accommodation (see above Tables)
- Significant retail services - including major shopping centres and department stores
- Wide range of cafes and restaurants
- Entertainment (hotels, clubs, sports and recreational facilities)
- All major banks and financial institutions (Bendigo Bank and Commonwealth Bank)
- Real estate agents (numerous)
- Employment agencies (Matchworks, Fox Personnel)
- Medical and emergency services including the St John of God Hospital which has a 24-hour emergency department.

Maryborough

Maryborough (population of approximately 8,000 persons) is the closest large settlement to the subject site, comprising a 15-minute drive (13km) along the Pyrenees Highway. Maryborough offers a mix of small-scale industry support services and a wide-range of township services for relocating workers; therefore, is likely to perform a significant project role. Maryborough's township services include:

- Construction-related services located in and around Hamer Industrial Estate, including Eureka Concrete, Maryborough Machinery Hire, Leech Earthmoving Contractors, auto mechanics, steel fabricators, Maryborough Transport Services, Central Victorian Transporters etc.
- Trade supplies (Mitre 10)
- Fuel supplies (Caltex diesel outlet, United, Shell)
- Good range of commercial and private accommodations options (as noted above)

- Cafes, bakeries and restaurants
- Entertainment (hotels, clubs, Lake Victoria, sports and recreational facilities)
- Retail services (Aldi, Coles, IGA, Woolworths, pharmacies etc)
- Real estate (Maryborough Real Estate, Professionals Maryborough)
- Employment agencies (Goldfields Employment and Learning Centre)
- Most major banks and financial institutions (ANZ, Commonwealth, Westpac)
- Medical facilities, including Maryborough Public Hospital (with urgent care services), medical centres etc.

In terms of relevant local labour supply, 41% of Maryborough workers are employed in construction-related occupations (1,055 workers), further highlighting the significance of the town for the Project.

Castlemaine

Castlemaine is a regional township of approximately 7,000 persons, which is located approximately 35km or a 30-minute drive east of the subject site via the Pyrenees Highway.

While Castlemaine does not provide many construction support services, the township offers an attractive location for project workers relocating to the area. This is highlighted by Castlemaine's growing reputation as a tourist destination (e.g. food & wine, arts & culture, heritage) and as a commuter town for those working in Melbourne. Castlemaine's township services include:

- Good range of commercial and private accommodations options, including boutique accommodation
- Cafes, bakeries and restaurants, including fine dining facilities
- Theatre Royal (Cinema, theatre, live music)
- Castlemaine Art Museum, galleries and antique stores
- Entertainment (hotels, clubs, sports and recreational facilities)
- Retail services including IGA, Target, pharmacies
- Some major banks and financial institutions (ANZ, Bendigo Bank)
- Some medical facilities, including Castlemaine Hospital and medical centres.

Carisbrook

Carisbrook is the closest settlement to the subject site, with a travel distance of less than 10 minutes (6km) east along the Pyrenees Highway. Carisbrook (State Suburb) has a population of 1,115 persons.

Carisbrook services include:

- Three commercial accommodation establishments:
 - Lochinvar Farm Homestead & Cottages (12 rooms across the property),
 - Carisbrook Country Retreat Motel (4 rooms)
 - Romantic Vineyard on the Creek 2 (rooms).

Each of these facilities provide home cooked meals for guests.

- Hanson Quarries
- Supermarket and newsagent
- Britannia Hotel, which provides meals (lunch and dinner)
- Caroline’s Colonial Restaurant.

In terms of relevant local labour supply, 44% of Carisbrook workers are employed in construction-related occupations (200 workers), highlighting the broader role the township might play in the Project.

2.7 Conclusions

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

- 1 The Study Area (which includes the Local Government Areas of Ballarat, Bendigo, Mount Alexander, Hepburn and Central Goldfields) has a resident population of approximately 267,000 persons (2017), which is expected to reach approximately 315,000 persons by 2031 representing a modest annual growth rate of 1.2% over the period. However, outside the major regional cities of Ballarat and Bendigo, population growth is forecast to be modest, especially in Central Goldfields Shire (in which the project will be located) where no growth is forecast over the period. Major projects, such as the proposed Carisbrook Solar Farm, which stimulate new investment and jobs locally should therefore be encouraged.
- 2 Central Goldfields Shire is the most disadvantaged municipality in Victoria based on ABS SEIFA data for 2016. This factor highlights the need for new investment, jobs and economic stimulus to support the local economy.
- 3 The Study Area has an unemployment rate of 6.0% (7,730 persons unemployed), which is above both the regional Victoria and State unemployment rates of 5.3% and 5.8% respectively. Central Goldfields Shire has an unemployment rate of 7.8% (415 persons unemployed), which is significantly higher compared to regional and State averages. In this regard construction of the Carisbrook Solar Farm provides new short-term employment opportunities for the local/regional labour force participants, with a small amount of ongoing employment also supported once the facility is operational.
- 4 The Study Area's occupational and business structures indicate a good base exists to service the needs of the solar farm project, including approximately 35,400 construction-related workers (based on occupation) and approximately 4,900 construction and transport businesses. Locally, Central Goldfields Shire includes approximately 1,800 construction-related workers and 170 construction and transport businesses.
- 5 The major regional cities of Ballarat and Bendigo have the capacity and labour force to support many aspects of the Project, including some specialist roles. Locally, the Maryborough/Carisbrook townships given their close proximity to the subject site are likely to play a significant role in the Project through labour supply, accommodation provision, selected construction services, retail, and food & beverage services.

3 ECONOMIC IMPACT ASSESSMENT

3.1 Project Investment

The total construction cost for the Carisbrook Solar Farm project is estimated to be approximately \$100 million, according to information provided by Ib vogt GmbH. The major investment costs are related to 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 regarding project management, financing, insurance and other project costs.

3.2 Project Employment

Construction Phase

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

Direct Construction Employment

Ib vogt GmbH has indicated that 240 jobs will be generated as part of the Carisbrook Solar Farm, over the lifetime of the construction phase, which is expected to be approximately 7-9 months. At the peak of the Project, approximately 150 jobs will be supported. These jobs include full time, part-time and casual labour.

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

- Landscaping
- Fencing
- Security
- Catering
- Trenching / digging / land clearing
- Fixing (mainly of PV panels to racking framework)
- Piling
- Roads / laneways
- Electrical works (cabling and connections)

As indicated in Chapter 2, the business structure of the Study Area including local townships, indicates that a good mix of these types of services is available; therefore, it is reasonable to

expect 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 380 jobs over the 7-9 month 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 Study Area will include jobs supported through accommodation, trade supplies, fuel supplies, transportation, food and drink etc.

Total Construction Employment

In summary, approximately 620 jobs (240 direct jobs and 380 indirect jobs) are expected to be generated by the Carisbrook Solar Farm project during the 7-9 month construction phase.

The amount of employment required for the Project from within the Study Area is estimated by the proponent to be approximately 140 jobs (60% of total construction employment). This represents less than 1% of the Study Area's labour force occupied in construction-related activities (35,410 workers) and this should not present a constraint to labour supply for the Project.

When local employment is considered Central Goldfields Shire, 8% of the Shire's construction-related workforce would be required to service the Project if all 140 jobs were sourced locally.

Operational Phase

Direct Operational Employment

Ib vogt GmbH indicates that up to 5 jobs will be supported on an ongoing basis through the operation and maintenance of the Carisbrook Solar Farm, with 2 permanent jobs expected to be locally based.

Indirect Operational Employment

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 15 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 (i.e., 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 that 25% of indirect jobs are created in the Study Area/locally. This equates to approximately 4 ongoing new positions (rounded) created in the Study Area/locally through the Carisbrook Solar Farm project.

Total Operational Employment

In summary, approximately 20 jobs (5 direct and 15 indirect) are expected to be generated by the Carisbrook Solar Farm project through its ongoing operations, of which 6 positions are expected to be created in the Study Area/locally.

3.3 Cumulative Effects Assessment

The Carisbrook Solar Farm project may need to compete for labour and resources with other infrastructure projects being developed in the Study Area/locally.

At this stage; however, apart from the Chicken Broiler project at Strathlea (50 construction jobs), there are no approved large-scale infrastructure projects in the immediate area which are likely to present any negative cumulative impacts on labour and resources.

RES Australia have recently announced a proposal to develop a solar farm in Baringhup, several kms north-east of the subject site. The Baringhup Solar Farm is currently in the early stages of planning and planning approval will be sought from Mount Alexander Shire Council to facilitate the development.

It terms of timing, it is likely the Baringhup project would commence (subject to planning approval and financing) after the completion of the Carisbrook Solar Farm, rather than the two projects overlapping. If the two projects were to proceed and be developed sequentially, this would provide an extended period of economic stimulus for local communities.

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 locally where possible.

As identified above, the Study Area comprises approximately 4,900 construction firms and many other businesses associated with activities likely to be required for the Project, such as transport operators, trade suppliers, auto mechanics etc; while locally Central Goldfields Shire includes 170 construction-related businesses and a range of other businesses which could provide service to the Project. Local examples of potential service provision include concrete suppliers Hanson Quarries and Eureka Concrete, machinery hire and trade supplies, accommodation services and catering services through the many food establishments in the local area.

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 engagement by the proponent. Ib vogt GmbH has already started this process, by setting up a contractor's book for potential local suppliers to express an interest in providing services to the Project.

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 Ib vogt GmbH 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 specialist electricians. 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 approximately 2,300 rooms in commercial accommodation establishment (hotels, motels and apartments with 15 rooms or more). Assuming each non-local worker requires individual accommodation, only approximately 2.6 % 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.

Realistically many workers will choose to be accommodated as close to the subject site as possible to reduce travel time and costs. It is estimated there are approximately 100 commercial rooms in motels, hotels and holiday rentals/b&bs located in and around Carisbrook/Maryborough.

Further local accommodation is provided in Maryborough's two caravan parks including 25 individual cabins/villas, while there are approximately 10 locally listed Airbnb listings which could potentially be used as shared worker accommodation.

Townships such as Dunolly, Majorca and Talbot also provide a small amount of accommodation which might be suitable for project workers, given the relatively short commute from these towns to the subject site (i.e. less than 30 minutes).

As noted earlier, room occupancy rates for Maryborough's main motels (15 rooms and over) were approximately 55% during the peak March Quarter 2016, indicating significant capacity exists to host project workers locally.

This data indicates a significant opportunity exists for local commercial accommodation providers to benefit from the Project through higher occupancy rates and revenues, particularly during off-peak periods. Additionally, local private property owners might leverage hosting opportunities during the construction phase through Airbnb listings, real estate etc.

3.6 Local Wage Spending Stimulus

Ib vogt GmbH estimate that 40% of the 240 jobs in construction (95 jobs) are likely to be sourced from outside the Study Area, particularly specialist and management positions.

This level of employment would equate to \$1.9 million in wages (2018 dollars) on the basis that each non-local worker (95 workers) is employed on average for 3 months and earns the average construction wage of \$80,000 pa including on-costs (source: ABS, *Average Weekly Earnings 6302.0*, November 2017).

A considerable portion of these wages would be spent locally, where the workers will be based. An estimated \$430,000 in wages (2018 dollars) would likely be directed to local and regional businesses and service providers during the construction period. This estimate is based on reference to the ABS *Household Expenditure Survey* which indicates that approximately 75% of post-tax wages are likely to be spent by workers in the regional economy in view of the wide range of goods and services available in the Study Area. This spending would include the following:

- Housing expenditure, including spending on accommodation at hotels, motels, caravan/holiday parks B&Bs, and private rental dwellings
- Retail expenditure, including spending on supermarket items, clothing, books, homewares etc
- Recreation spending associated with day trips and excursions, gaming (lottery, sports betting, etc), purchases in pubs and clubs (although noting that expenditures at restaurants is included in the retail category)
- Personal, medical and other services, such as local prescriptions and GP fees, fuel, vehicle maintenance and so on.

This level of worker spending would support jobs in the local services sector 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 Carisbrook Solar Farm on agricultural activity is noted as follows:

- Approximately 300ha of productive farming land, including some irrigated land, might be unable to be used during the lifetime of the solar farm.
- This will affect land used principally for cropping and sheep grazing (for meat production).
- The Northern Central Natural Resource Management (NRM) Region, the broad region in which the Study Area is located, contains approximately 1,970,000ha of productive agricultural land supply (ABS Agricultural Commodities, Australia 2016-17). In this regional context, the loss of agricultural land associated with the Carisbrook Solar Farm amount to just 0.02% of all productive agricultural land supply.

- The property owners will be compensated for hosting the solar farm through annual payments from the solar farm operator. It is understood that these payments will result in significantly higher farm incomes compared with continuation of existing activities across the subject landholdings.
- The proponent is looking at ways to facilitate ongoing sheep grazing on the site around and beneath the solar structure through the preparation of a land management plan.
- The land can be rehabilitated to its original condition at the end of the Project when all above ground infrastructure is removed, allowing cropping, sheep grazing (or other farming activities) to recommence.

3.8 Financial Returns to Council

Payments in Lieu of Council Rates

Victoria's Local Government Review Panel (*Rating Arrangements under the Electricity Act 2000*, April 2005) provides guidelines to assist in determining the amount payable to Councils from electricity generation projects (i.e. payments in lieu of rates).

Panel Recommendation Two states:

"Payments in lieu of rates should be based on \$40,000 flagfall plus \$900 per MW of rated capacity – both in July 2005 values, and to be indexed annually in line with the Melbourne CPI"

While Review Panel recommendations are not statutory, they provide the basis for arbitration should agreement not be forthcoming between the parties involved.

It is recognised that the level of rates payable is dependent on the operating performance of the facility, with the Act providing for the following discounts on the payment figure, which should apply to generators operating at low capacity:

- A 50% discount should apply to generators operating at less than 10% capacity
- A 25% discount should apply for generators operating at between 10 and 20% of capacity.

Assuming the solar farm is operational in 2020 (and applying a 3.0% CPI factor from 2005 onwards), the Review Panel guidelines indicate that approximately \$62,320 flagfall plus \$1,400 per MW of rated capacity would be payable to Council in the first year of the Carisbrook Solar Farm operation, and this would amount to approximately \$166,080 in revenue pa to Central Highlands Shire Council, based on an efficiently functioning 74 MW rated capacity project (where no discounts apply).

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 and the like. Therefore, the uplift in

revenues generated from the operation of the solar farm on the subject site will represent a net return to Council.

In the context of Central Highlands Shire, the proposed revenue to Council from the operation of the Carisbrook Solar Farm represents a 1.2% uplift on total annual rates and charges for 2017/18 (\$14.0 million).

This uplift in revenue is especially important in the current rate capping environment (Fair Go Rates System) which exists in Victoria.

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

3.9 Ongoing Economic Stimulus

Ib vogt GmbH advise that the solar farm will be located across three landholdings, providing annual income returns to these host landowners over the 25-year leasing period (with the potential for a further 5-year extension).

These new income streams can be particularly important in supporting the financial sustainability of large rural farms, and much of this income will remain within the local economy.

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.

As noted above, significant payments in lieu of rates revenues will be generated from the operation of the solar farm for Central Goldfields Shire Council, and these revenue returns will increase in line with CPI over the 25-year period.

Additionally, an estimated 6 permanent local 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 /regional businesses and communities.

Based on the above factors it is estimated the Study Area will receive an estimated economic stimulus of \$28.7 million over 25 years (adjusted for CPI @ 2.5% pa) through these effects. Note, the vast majority of this stimulus is likely to be retained locally within the Central Goldfields Shire.

3.10 National Grid Supply Benefits

The Carisbrook Solar Farm has the potential to provide sufficient renewable energy to support the annual electricity needs of approximately 43,600 Victorian households. This calculation is based on:

Carisbrook Solar Farm Capacity (74,000 kW) x Annual Hours (8,760) x Capacity Factor (0.26) / Average Victorian Household Electricity Consumption (3,865 kWh) - Source: AMEC 2017 – Residential Electricity Price Trends (<http://www.aemc.gov.au/markets-reviews-advice/2017-residential-electricity-price-trends>).

In a regional context, the Study Area currently contains approximately 105,000 dwellings (ABS Census 2016); therefore, the Carisbrook Solar Farm has the potential to provide the annual electricity needs approximately 42% of the Study Area's dwellings.

In a local context, Central Goldfields Shire currently contains approximately 6,300 dwellings (ABS Census 2016); therefore, the solar farm facility has the potential power the Shire seven times over.

This data highlights the importance of the Carisbrook Solar Farm from a clean electrical generation perspective for local and regional communities.

3.11 Environmental Benefits

Once fully-operational, the Carisbrook Solar Farm will result in the reduction of an estimated 168,500 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:

Carisbrook Solar Farm Capacity (74 MW) x Annual Hours (8,760) x Capacity Factor (0.26)

This reduction on CO₂ emissions is the equivalent of taking approximately 60,000 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 Carisbrook 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:

- 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 townships such as Carisbrook and Maryborough.

3.13 Conclusions

- 1 The Carisbrook Solar Farm project will involve approximately \$100 million in investment during the construction phase and will support 240 direct and 380 indirect positions over the 7-9 month construction period. Once operational, 5 direct and 15 indirect jobs will be supported by the facility.
- 2 Accessing adequate labour supply should not present an issue for the Project, noting the local employment requirement for the Project (140 jobs) represents less than 1% of workers occupied in construction-related activities in the Study Area (35,410 workers) and 8% of local workers occupied in these activities (1,800 workers).
- 3 The only approved infrastructure project in the immediate area that may be constructed at the same time as the solar farm is the Strathlea chicken broiler facility; however, this project is unlikely to impact on labour and resources required to support the Carisbrook Solar Farm project given its relatively small scale.
- 4 The Project will provide significant participation opportunities for businesses and workers located in the Study Area and locally, noting the good match of skills and resources available. In this regard, the proponent has already started engaging with potential suppliers to ensure as much local resources are used for the Project as is practicable.
- 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 less than 3% of total commercial accommodation rooms in the Study Area. Locally, accommodation providers in Central Goldfields Shire (especially in Carisbrook and Maryborough) will benefit significantly from this demand for accommodation given their close proximity to the subject site. This would provide a boost for the local accommodation sector, noting relatively low existing room occupancy rates, and also provide increased opportunities for private property owners in the rental market.
- 6 Construction workers would be expected to inject approximately \$430,000 in additional spending into the local economy over the construction phase, supporting businesses and employment in Carisbrook, Maryborough and other townships in the Central Goldfields Shire.
- 7 Approximately 300ha of productive agricultural land (cropping and grazing) will temporarily be lost to accommodate the solar farm. However, this represents only 0.02% of all productive farming land supply in the North Central NRM Region with the proponent looking to continue grazing on the site, under and around the solar structure potentially reducing the amount of land lost to the Project. Importantly, the host landowners will improve their annual incomes, as operator payments will be greater than existing farm incomes from these landholdings and the land can be returned to farming activities at the end of the solar farms lifecycle.
- 8 Ongoing economic stimulus associated with financial returns to Council (in lieu of rates), returns to host landowners and new wage spending is estimated at \$28.7 million over 25 years (adjusted for CPI @ 2.5% pa).

- 9 The Project has the capacity to supply sufficient clean energy to power approximately 44,000 homes and in the process reduce CO₂ emissions by 168,000 tonnes per year.
- 10 Once operational, the Carisbrook Solar Farm could potentially support small-scale tourism and educational opportunities in the future.