Appendix M

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DELBURN WIND FARM
ECONOMIC IMPACT ASSESSMENT

Delburn Wind Farm

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Jacobs Group (Australia) Pty Limited
ABN 37 001 024 095
Floor 11, 452 Flinders Street
Melbourne VIC 3000
PO Box 312, Flinders Lane
Melbourne VIC 8009 Australia
T +61 3 8668 3000
F +61 3 8668 3001
www.jacobs.com

Contents

Appendix A. Alternative method

Executive Summary

The Project

OSMI Australia is proposing to develop the Delburn Wind Farm (the Project) in the south east region of Victoria, 150km from Melbourne. The Project will involve the construction of 33 wind turbines, built within existing timber plantations – being the Thorpdale Tree Farm owned and managed by HVP Plantation - in the south of the Latrobe Valley. The site is primarily located within the Latrobe City Council area, with some parts in the Baw Baw and South Gippsland Shires.

Construction is assumed to commence in 2022 for a period of 18 to 24 months and the wind farm is expected to operate for 25 to 30 years. It is anticipated that the wind farm will generate approximately 590,000 megawatt hours (MWh) of electricity per annum.

Socioeconomic baseline

Based on the existing and projected economic conditions of the area surrounding the Project, the Project is expected to support the GRP and employment in each of the three local government areas (LGAs). In particular, the project will help address the following regional challenges:

- The three affected LGAs (the region) are expected to experience decreased economic activity over the current and next financial year due to the COVID-19 pandemic. Unemployment rates in Baw Baw, Latrobe and South Gippsland are expected to increase significantly in line with State-wide projections, to about double the rate before the pandemic, and take years to reduce.
- There is a continued need to diversify the economy in these LGAs ahead of the continued planned retirements of coal-fired generation in the Latrobe Valley.
- Latrobe, Baw Baw and South Gippsland have lower average incomes than Victoria and Latrobe also has a high relative level of socio-economic disadvantage.

The three LGAs also have the workers, businesses and infrastructure required to support delivery of the Project. In particular:

- There is a relatively high proportion of labourers, technicians and trades workers to provide a talent pool for the type of workers that will be needed for the Project.
- There are medium sized businesses within the transport, postal and warehousing industry in the South Gippsland LGA and within the manufacturing and construction businesses across the region to produce equipment, undertake construction and move goods to the site.
- Due to the current and past coal-fired electricity generation in Latrobe, it already has the high-capacity transmission connection to the Victorian grid required. This transmission connection is unlike other parts of the State where the capacity and strength of the current transmission network is often a key constraint for existing and planned renewable generation.

Summary of impacts

The Project is expected to deliver substantial ongoing economic benefits to the Latrobe, Baw Baw and South Gippsland LGAs. It will create a new source of employment and pump a significant amount of investment into these regional economies, which will help offset some of their projected economic slowdown and high unemployment. The Project will leverage existing transmission assets and utilise local skill sets. From a regional, State and national perspective, the Project will contribute to the achievement of renewable energy generation targets.

Impact analysis

The Project's impact on Gross Regional Product (GRP) and regional employment, as well as Gross State Product and Victorian employment, have been assessed quantitatively using Input-Output analysis. The total economic impact of a project is comprised of direct economic impacts as well as indirect impacts. The Economic Impact Analysis Tool, developed at Flinders University, was used to estimate these regional impacts. An alternative method using The Clean Energy Council (CEC) report 'Wind Farm Investment, Employment and carbon abatement in Australia' has been used to estimate the state impact given the state impact is not available from the Flinders University tool. As different methods have been used for the regional and state impact modelling, the impacts calculated for regional impacts and state impacts are not perfectly aligned.

The combined construction and operation of the Delburn Wind Farm are expected to create a $106 million increase in GRP (Gross Value Added[1]) to the three LGAs over the 32-year period, as outlined in Figure 1. The Project will add $22.5 million annually to the region for the two years of construction and $2.1 million annually for the 30 years of operation.

Figure 1: Total impact on GRP over project life

The Project will create an additional 186 full time equivalent (FTE) jobs in the three LGAs combined during the two years of construction and an additional 25 ongoing FTE jobs for the thirty years of operation, as shown in Figure 2 .

Figure 2: Annual employment impact

The Project's impact on Gross State Product (GSP) is estimated to be about $401 million (approximately $200.7 million spent annually over two years). This is assuming the Delburn wind farm has a 200 MW capacity. The expected total annual impact of the Project on state employment is expected to reach up to 2,016 FTE jobs per year during the 24-month construction phase and up to 76 FTE jobs each year during operations.

In addition, the Project will have a number of other impacts that have been assessed qualitatively:

[1] Gross Value Added (GVA) is defined as total factor income plus taxes and less subsidies on production.

- **Property value impacts**: It is unlikely there will be any adverse impact on property prices at any stage of the Delburn Wind Farm's development.
- **Income impacts**: The owner of the land used for the Project would benefit from an annual lease payment of approximately $1.5 million. Additionally, the 103 neighbouring dwelling owners within 2km of the wind farm will receive a combined approximate $500,000 per annum in neighbour contributions.
- **Community impacts**: The Project will provide $150,000 per annum to a Community Development Fund to support community and environmental programs, 6.2km of local road upgrades and repairs and $403,000 in municipal charges under the Electricity Act to Latrobe, Baw Baw and South Gippsland LGAs.
- **Energy impacts:** The Delburn Wind Farm will generate approximately 590,000 MWh of renewable energy each year, helping to meet Victorian Government renewable energy targets and to replace the electricity that will be lost from retirement of coal-fired power stations in Victoria.
- **Environmental impacts:** Depending on the impact of the Project on the mix of power generation in Victoria, the Project has the potential to reduce carbon emissions and produce benefits of up to approximately $9.5 million each year or $285.7 million over the Project's 30-year life.

Important note about this report

The sole purpose of this report and the associated services performed by Jacobs is to assist in the understanding of the potential impacts of developing the Delburn Wind Farm in the Latrobe Valley, in accordance with the scope of services set out in the contract between Jacobs and Delburn Wind Farm Pty Ltd (the Client).

In preparing this report and the associated Input-Output analysis, Jacobs has relied upon, and presumed accurate, information (or confirmation of the absence thereof) provided by the Client and/or from other sources. In particular, the modelling has relied upon information provided by the Australian Bureau of Statistics and Flinders University Input-Output tool on a public basis, as well the clients' information on construction and operating costs, generation potential, timelines and benefit schemes. Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete, then it is possible that our observations and conclusions as expressed in the report may change.

Jacobs derived the data in this report from information sourced from the Client and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

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1. Glossary

Abbreviation	Full name
AAGR	Average Annual Growth Rate
ABS	Australian Bureau of Statistics
FTE	Full Time Equivalent
GRP	Gross Regional Product
GSP	Gross State Product
GVA	Gross value-added
IRSD	Index of Relative Socio-Economic Disadvantage
I-O	Input-Output
LGAs	Local Government Areas
MW	Megawatts
MWh	Megawatt hours
NPV	Net Present Value
SEIFA	Socio-Economic Indexes for Areas
VRET	Victorian Renewable Energy Targets

2. Introduction

2.1 Project description

OSMI Australia is proposing to develop the Delburn Wind Farm (the Project) in the south east region of Victoria, 150km from Melbourne. The Project will involve the construction of 33 wind turbines, , built within existing timber plantations – being the Thorpdale Tree Farm owned and managed by HVP Plantation - in the south of the Latrobe Valley. The site is primarily located within the Latrobe City Council area, with some parts in the Baw Baw and South Gippsland Shires.

OSMI Australia has over 25 years of wind farm development experience in Victoria and will lease land from the owner of the timber plantations for this project. The Project will contribute to the transition to renewable energy, with a capacity of about 200 megawatts (MW). It is anticipated that the wind farm will generate approximately 590,000 megawatt hours (MWh) of electricity per annum.

2.2 Purpose of the report

The purpose of this study is to assess the impact the wind farm will have on the regional economies. The assessment is both quantitative and qualitative.

Key economic impacts include:

- Employment generation;
- Economic contribution measure (gross value-added (GVA)); and
- Impacts on average incomes, property values, the Victorian energy market and the wider community.

2.3 Structure of the report

This report is structured as follows:

1) Introduction, providing a description of the project and an overview of the report purpose and structure.
2) Methodology, outlining the process used to estimate the impacts on the regional and broader economy.
3) Socio-economic baseline, describing the existing and expected future conditions of the region.
4) Project assumptions, outlining the key assumptions about the Project used to inform the impact analysis.
5) Economic impact assessment, discussing the impact of the Project on the regional economy during construction and operation.
6) Conclusion, providing a brief summary of the key findings of the report.

3. Methodology

This section outlines the process used to estimate the impacts on the regional and broader economy.

3.1 Socio-economic baseline

The socio-economic baseline summarises the existing economic conditions of the area surrounding the Project and expected future conditions in the absence of the Project. This baseline allows the impact of the Project to be measured by the difference in economic conditions with and without the Project.

The socio-economic baseline focuses on the three Local Government Areas (LGAs) that the Project is located in: Latrobe, Baw Baw and South Gippsland. Where available, Australian Bureau of Statistics (ABS) data has been used for the economic context. Where ABS data is not available or out of date, Remplan statistics have been used.

3.2 Economic Impact Assessment

The key objective of an economic impact assessment is to identify the key positive and negative economic impacts of a project. The economic impact assessment for this Project considers contributions to gross value added (GVA) and employment, assessed quantitatively using the Input-Output methodology outlined in Section 3.2.1. Some of the other impacts, including the impacts on incomes and climate change, have been assessed quantitatively using other methods, while others, such as the impacts on the community, Victorian energy market and property values, have been assessed qualitatively.

3.2.1 Input-Output analysis

The total economic impact of a project is comprised of direct and indirect economic impacts. The project expenditure creates larger economic activity as it moves through the economic system.

- Direct impacts are those that relate to the initial or immediate activity. This includes the employment during the construction and operational phases and expenditure on the construction materials.
- Indirect (induced) impacts are those resulting from the linkages between different parts of the economy. These impacts include increases in output and employment from businesses supporting the direct suppliers to the project. It also includes the output and employment impact from increased income to the employees and owners of the businesses directly supplying the project.

The approach provides an estimate of the total economic impact of project expenditure. It utilises Input-Output (I-O) tables, which describe relationships between suppliers and buyers across industries and sectors within the economy. The tables illustrate the interdependencies within the economy, with an output from one industry being an input to another. The detailed treatment of industry sectors in the tables allows the linkages between various economic agents in the economy to be examined and extrapolated to estimate the direct and indirect impacts of the investments being considered. Multipliers are used to represent these relationships. A multiplier is a percentage increase in final output or employment resulting from the initial effect – in this case the construction or operation of the new wind farm. The basic input-output modelling methodology is shown in Figure 3.

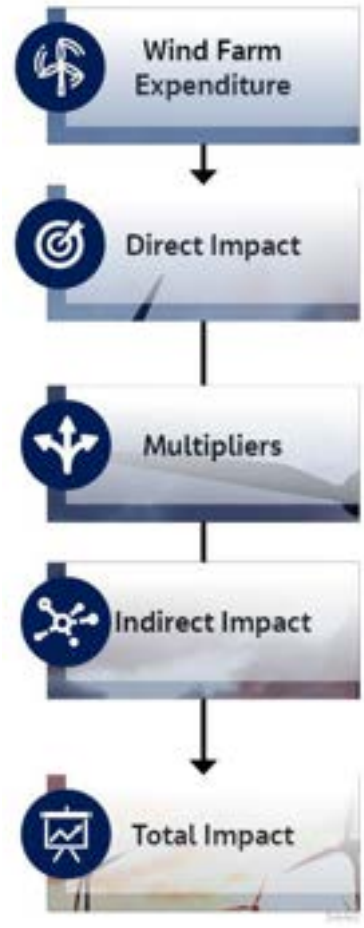


Figure 3: Input-output modelling

The two types of economic impacts that have been analysed using I-O modelling in this report are Gross Regional Product (Gross Value Added) and employment, outlined in Table 1.

Table 1: Impact types in the IO model

Value added (Gross Regional Product)	Employment
Gross Regional Product (GRP) is equal to economic output, less the costs of goods and services used by these industries in the production process (intermediate consumption) but before deducting consumption of fixed capital (depreciation). To avoid double counting, only the value added at each stage of production is included in GRP and not the total expenditure. This is the standard measure in Australia to represent the size of an economy.	A measure of employment levels (full time equivalents) required to service the demand for economic output per annum.

Two different methods have been used to estimate the impact on regional economy as outlined below.

Flinders University regional IO tool – regional impact modelling

To estimate the impact on the three LGAs, the Economic Impact Analysis Tool, developed at Flinders University, was used. This tool utilises a regional I-O model to estimate the economic impact on a specific local government area of a project's expenditure. It draws on 2011 Census industry of employment data and the 2009/10 national

I-O table to calculate industry multipliers (Australian Urban Research Infrastructure Network, 2020b). This tool does not provide impacts at a state level, so an alternative method has been used to estimate these impacts.

Clean Energy Council Report – state impact modelling

An alternative method using The Clean Energy Council (CEC) report 'Wind Farm Investment, Employment and carbon abatement in Australia' has been used to estimate the state impact and sense check the regional impact. In the CEC report, the impact on regional, state and national employment is estimated based on a per MW basis.

Using the CEC method for the regional impact, both total employment and GRP value-added are higher than forecast by the Flinders University Analysis Tool, so using the Flinders University Analysis Tool for this economic impact analysis is conservative. The regional impact comparison has been included in Appendix A. Although the data in the CEC report is specific to Australian wind farms, it is older data and only provides a general regional estimate.

3.2.2 I-O analysis limitations

The I-O analysis is based on certain restrictive assumptions including:

- Constant prices over the life of the project – the I-O model assumes that regardless of the stimulus caused by the Project, the impact on prices is negligible;
- Fixed technology – Industries have a linear production function, which implies constant returns to scale and fixed ratios of intermediate inputs to production;
- Fixed import shares – the I-O model represents a snapshot in time and impacts are calculated based on the linkages between industries observed for this snapshot in time, implying that the share of imports remains constant;
- Unlimited supplies of all resources, including labour and capital;
- Firms within a sector are homogeneous, which implies they produce a fixed set of products that are not produced by any other sector and that the input structure of the firms are the same; and
- No dynamic processes involved in the adjustment to an external change.

As a result of these assumptions, the results involve a certain degree of uncertainty. These uncertainties are particularly relevant given the recent changes in economic conditions as a result of the global pandemic. Therefore, these results should be treated as representative and not be interpreted as a forecast for economic growth.

4. Socio-economic baseline

This chapter describes the main demographic and socio-economic attributes of the region. These are the existing and expected future conditions of the region without taking into consideration the impacts of the Project.

4.1 Study area

The proposed development site is on timber plantation land centred in the Delburn area. The site is primarily located within the Latrobe City Council but also extends to the Baw Baw and South Gippsland Shires. Figure 4 shows the location of the Project with respect to the bordering LGAs. The site is bounded by Hernes Oak to the north, Coalville, Narracan and Thorpdale to the west, Darlimurla to the south, and Driffield, Yinnar and Boolarra to the east[2]. The township of Morwell is approximately 5km to the north-east of the development site[3] and the township of Moe is approximately 5km to the north. There are no dwellings within 1km of the proposed wind turbines and 103 dwellings within 2km.

Figure 4: Location of Delburn Wind Farm

Source: Research Gate (2018). The Impact of Bushfires on Water Quality

In Figure 5 the orange shaded area shows the wind farm site boundaries and the pink lines show the LGA boundaries. The grey dots represent nearby dwellings. The main access road is the Strzelecki Highway, with secondary access provided by Deans Rd, Golden Gully Rd, Smiths Rd and Creamery Rd.

[2] Local towns surrounding the site
[3] As measured from the outer boundaries of both the township and the project land

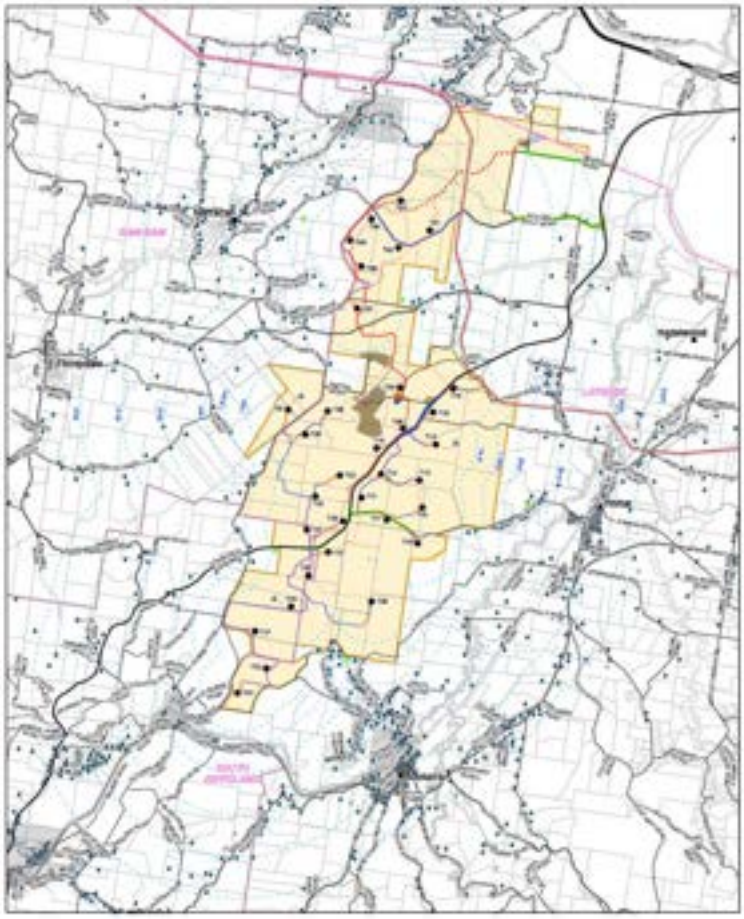


Figure 5: Map of Delburn Wind Farm and surrounding local councils

Source: OSMI Australia

4.2 Population

The populations of Latrobe, Baw Baw and South Gippsland in 2019 were 75,561, 53,396 and 29,914 respectively (Table 2). These three regions have a combined population of 158,871, which is approximately 2.4% of Victoria's population. Between 2018 and 2019, Baw Baw's population grew by 2.7%, which a marginally higher than Victoria's population growth over the same period. This higher growth rate has been consistent over recent years, with Baw Baw's five-year average annual growth rate (AAGR) being 3.1% per annum (relative to 2.5% across Victoria). Annual population growth in Latrobe and South Gippsland has been much lower over this period.

Table 2: Resident population size, 2018 and 2019

	2018	2019	% change	5 yearly AAGR (2014 to 2019)
Latrobe	75,209	75,561	0.5%	0.5%
Baw Baw	52,012	53,396	2.7%	3.1%
South Gippsland	29,575	29,914	1.1%	1.4%
Victoria	6,462,019	6,596,039	2.1%	2.5%

Source: ABS 3218.0, Regional Population Growth, Australia, 2018-19, ABS 3218.0, Regional Population Growth, Australia, 2014-15

4.2.1 Population projections

The population growth in the three LGAs is forecast to decline over the period to 2036 in line with Victoria. This decline may be due to a relatively low rate of net migration from overseas and other states to Victoria (DELWP, 2019). Figure 6 displays the projected population five-yearly AAGR for Latrobe, Baw Baw, South Gippsland and Victoria between 2016 and 2036. Latrobe's and South Gippsland's population is expected to continue growing at a much slower rate than Victoria's population.

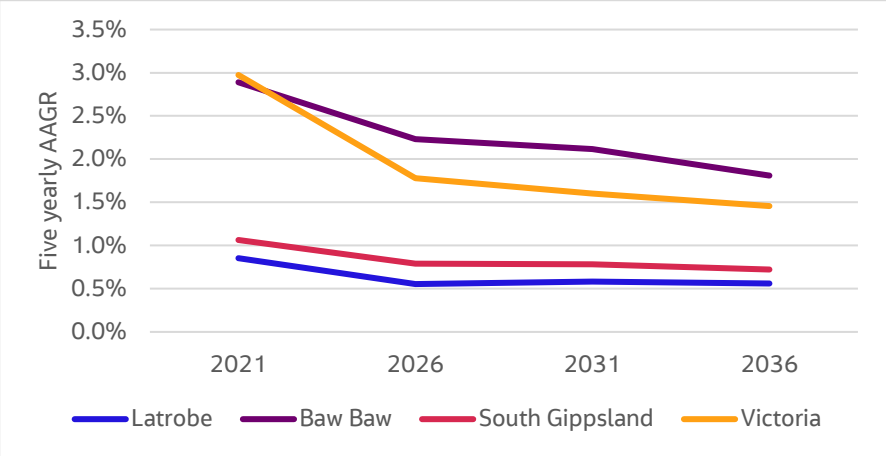


Figure 6: Projected population Five-yearly AAGR 2016-2036

Source: Victoria in Future Population Projections, 2019

Major projects such as Delburn Wind Farm may help retain population in Latrobe and South Gippsland by providing medium- and long-term employment and income opportunities for existing residents and businesses.

4.3 Regional output

GRP is the net measure of wealth generated by a region (while Gross State Product is that of a state). Due to ABS not reporting output by regional area, the analysis relies on GRP data from Remplan economic profiles (Remplan, 2020, Remplan 2020b, Remplan 2020c)[4].

As outlined in Table 3, Latrobe has the highest GRP of the three LGAs. In the financial year 2018, Latrobe's GRP of $5.32 billion contributed approximately 31.7% of Gippsland's (Victoria's eastern LGAs including Baw Baw, Latrobe, South Gippsland, Wellington and East Gippsland) GRP and 1.2% of Victoria's Gross State Product (GSP). In the same year Baw Baw contributed approximately 14.7% and South Gippsland contributed approximately 10.4% to Gippsland's GRP.

All of the regions surrounding the Project have recently experienced significant levels of growth in GRP. The average annual growth rates between 2013 and 2018 for Latrobe, Baw Baw and South Gippsland were 5.74%, 6.72% and 6.33% respectively.

Table 3: Gross Regional Product, June 2013-2018 (billions)

Region	2013	2014	2015	2016	2017	2018
Latrobe	$4.02	$4.17	$4.18	$4.86	$4.68	$5.32
Baw Baw	$1.78	$1.88	$1.95	$2.19	$2.29	$2.47
South Gippsland	$1.28	$1.35	$1.39	$1.56	$1.58	$1.74
Total	$7.08	$7.40	$7.52	$8.61	$8.56	$9.52

Source: Remplan Economy Profiles, Gross Regional Product

[4] Remplan estimate the GRP of LGAs using ABS Gross State Product, ABS National I-O Tables and ABS Census Place of Work Employment (scaled).

In 2019, the electricity, gas, water and waste water services industry had the greatest output for the Latrobe region at $2.6 billion, given the three large coal-fired power stations there. In 2018, Baw Baw's greatest output came from construction ($0.8 billion) and South Gippsland's greatest output came from the agriculture, forestry and fishing industry ($0.7 billion). Some of the biggest contributors to the region's agriculture, forestry and fishing industry include dairy farming, fruit and vegetable farming and timber production. The region is therefore heavily reliant on vulnerable industries, with the projected closure of coal-fired power stations in coming years and with the threats of climate change related natural disasters such as bushfires and drought.

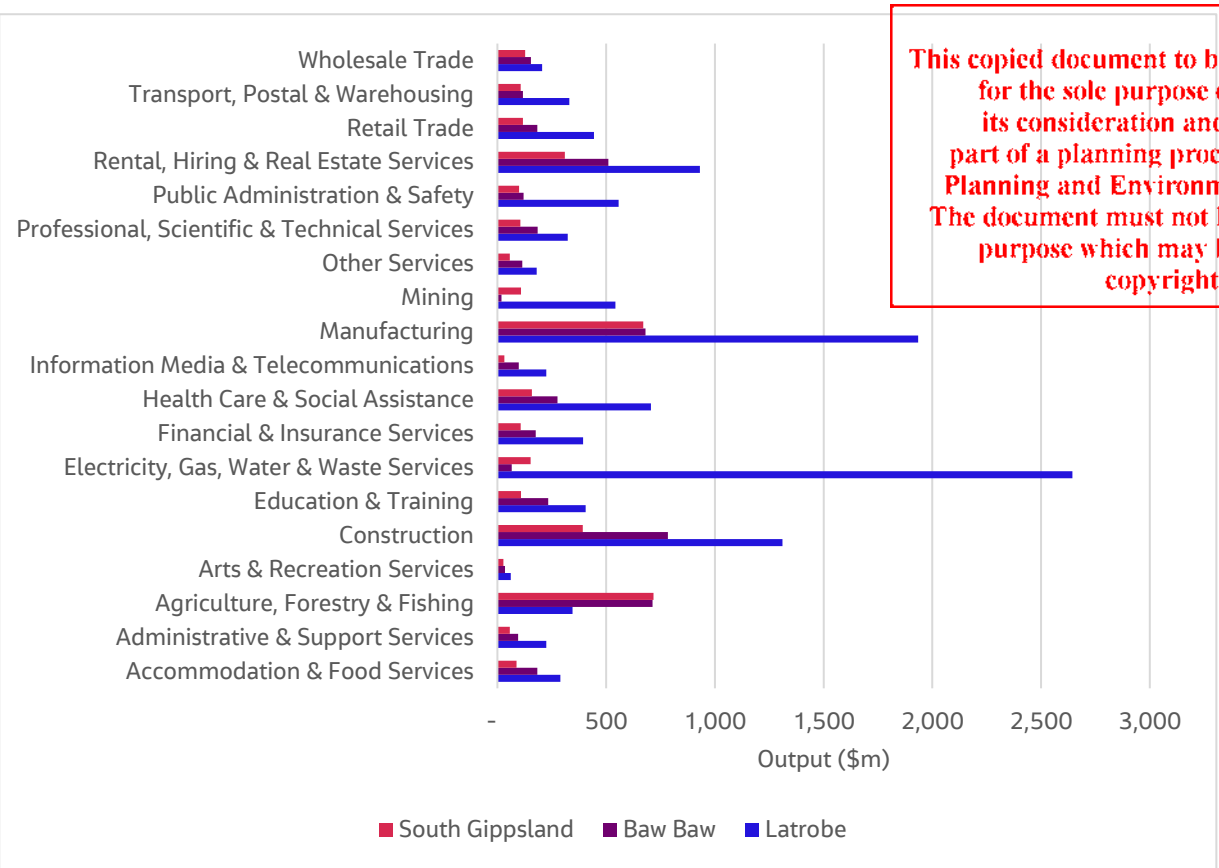


Figure 7: Output by industry

Source: Remplan Economy Profiles, Output

4.3.1 GSP and GRP projections

Victorian GSP has been significantly impacted due to the bushfires in January 2020 and the COVID-19 pandemic from March 2020. The January bushfires cost the Victorian economy an estimated $500 million – or 0.1 per cent of Victoria's GSP (Department of Treasury and Finance, 2020). Due to the COVID-19 pandemic, Victoria is expected to record negative economic growth in both 2019-20 and 2020-21 (Premier of Victoria, 2020).

The economies of Latrobe, Baw Baw and South Gippsland are also expected to be negatively impacted by the bushfires and to a significant degree by the COVID-19 pandemic over the current and next financial year. The forestry industry, which makes up a significant portion of the region's output, has been impacted by the January 2020 East Gippsland bushfires, causing damage and loss to the native logging coupes used by one part of this industry. With the pandemic, retail trade is a major industry for each of these LGAs and has been subject to falls in consumer spending. An analysis of Commonwealth Bank of Australia's debit and credit card data indicates that over the week to May 8, Victoria's consumer spending was down 7% (Chalmers, 2020). In addition, the accommodation and food sectors, which have been strongly affected by the COVID-19 and associated restrictions, are also relatively large in Baw Baw and South Gippsland. Latrobe City Council and Baw Baw shire are implementing business support for 700 local businesses experiencing adverse impacts of the COVID-19 pandemic (Latrobe City Council, 2020; Baw Baw Shire, 2020).

There is a strong need for projects to support the GRP in each of Baw Baw, Latrobe and South Gippsland given the pandemic and to increase the diversity of their economies ahead of the continued planned retirements of coal-fired generation in the Latrobe Valley. The Yallourn coal-fired plant is expected to begin progressively shutting down in 2029, but may close sooner due to climate change policies or if repairs become uneconomic (Carey and Toscano, 2019).

4.4 Workforce participation and employment

The labour force and unemployment statistics for the regions surrounding the Delburn Wind Farm are compared to the Victoria's in Table 4.

Table 4: Employment statistics by region, 2020 and 2016

	Labour force (March 2020)	Unemployment rate (March 2020)	Labour force (March 2016)	Unemployment rate (March 2016)
Latrobe	37,112	5.2%	36,625	9.4%
Baw Baw	26,175	2.6%	24,408	4.7%
South Gippsland	14,520	2.3%	14,196	4.4%
Victoria	36,338,000	5.2%	32,450,000	5.6%

Source: Department of Education, Skills and Employment, Small Area Labour Markets – December Quarter 2019, ABS 6202.0 Labour Force, Australia, Apr 2019, Table 5

Unemployment in the affected areas is below the Victorian average except for Latrobe. In 2020, Baw Baw and South Gippsland had unemployment rates below 3%, significantly lower than the Victorian average. Unemployment in Latrobe is now similar to the Victorian average.

All LGAs experienced a significant decrease in their unemployment rates relative to Victoria and a steady increase in their labour force, between March 2016 and March 2020. This can be at least partially attributed to efforts to develop their economies after the closure of the Hazelwood Power Station in 2017. Hazelwood employed 495 staff and about 300 contractors (Towell, 2019). Since late 2016, the Victorian Government has invested $266 million in stimulating economic and employment growth in the Latrobe Valley region. This funding has gone to the Latrobe Valley Authority, which is partnering with the community and businesses to deliver initiatives such as the Latrobe Valley Economic Growth Zone where companies investing in the area could be granted financial incentives; support for workers who lost their jobs; and a community infrastructure fund (Premier of Victoria, 2016). In addition, the Victorian Government has recently increased support to the region through the $40 million Latrobe Valley Economic Development Program, to further create economic diversification, growth and resilience (RDV, 2020).

4.4.1 Occupations of employment

The most common occupations in Latrobe, Baw Baw and South Gippsland are professionals, technicians and trades workers, managers and labourers, as shown in Table 5. This is a typical labour mix for regional Victoria.

Within these LGAs, there is a relatively high proportion of labourers, technicians and trades workers. Figure 3 shows the percentage of workers in different occupations in the Delburn region compared to Victoria. These workers could provide a talent pool for the type of workers that would be needed for the Project.

Table 5: Employment by occupation, 2016

Occupation	Latrobe (%)	Baw Baw (%)	South Gippsland (%)	Delburn region (average) (%)
Professionals	17.8	16.6	20.9	18.3
Managers	13.6	15.2	13.4	14.3

Occupation	Latrobe (%)	Baw Baw (%)	South Gippsland (%)	Delburn region (average) (%)
Clerical and Administrative Workers	11.9	11.2	10.2	11.5
Technicians and Trades Workers	15.2	16.5	15.1	15.9
Community and Personal Service Workers	10.5	10.8	9.8	10.7
Sales Workers	9.4	8.2	8.6	9.0
Labourers	11.9	12.9	13.1	12.7
Machinery Operators and Drivers	7.8	6.9	7.3	7.5

Source: ABS Census of Population and Housing, 2016

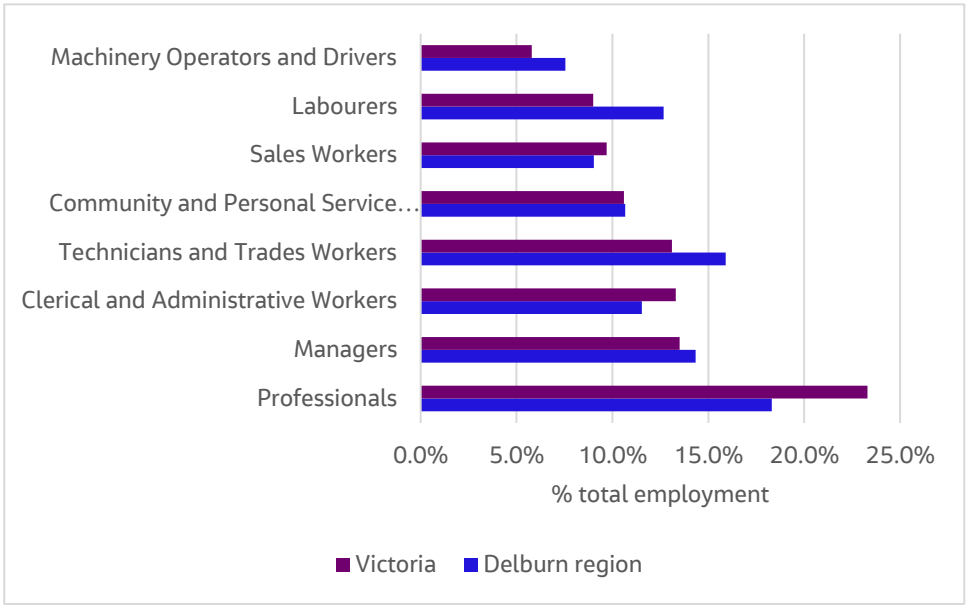


Figure 8: Employment by occupation, 2016

Source: ABS Census of Population and Housing, 2016

4.4.2 Industries of employment

Latrobe

As of the 2016 Census, Latrobe's largest industry of employment is health care and social assistance, contributing to around 16% of jobs. This makes up a larger proportion than the Victorian average of 13%. As shown in Table 5, retail trade and public administration are the next largest industries of employment.

The electricity, gas, water and waste services sector makes up around 8% of total jobs, which is significantly larger than Victoria as a whole at 1% of total jobs. The high level of employment in the sector reflects the three large brown coal power stations in operation: Loy Yang A, Loy Yang B and Yallourn. However, the non-renewable energy industry is in decline, with the closure of Hazelwood Power Station in 2017 and Yallourn and Loy Yang A expected to close in future decades. This Project presents an opportunity to soften these impacts by providing alternative employment for those industry workers currently unemployed.

In addition to the coal-fired power stations, other key businesses in the area are:

- Australia's largest yoghurt manufacturing facility;
- The largest pulp and paper manufacturer in Australia;
- The new Federation University; and

- The only manufacturer of passenger aircraft in Australia.

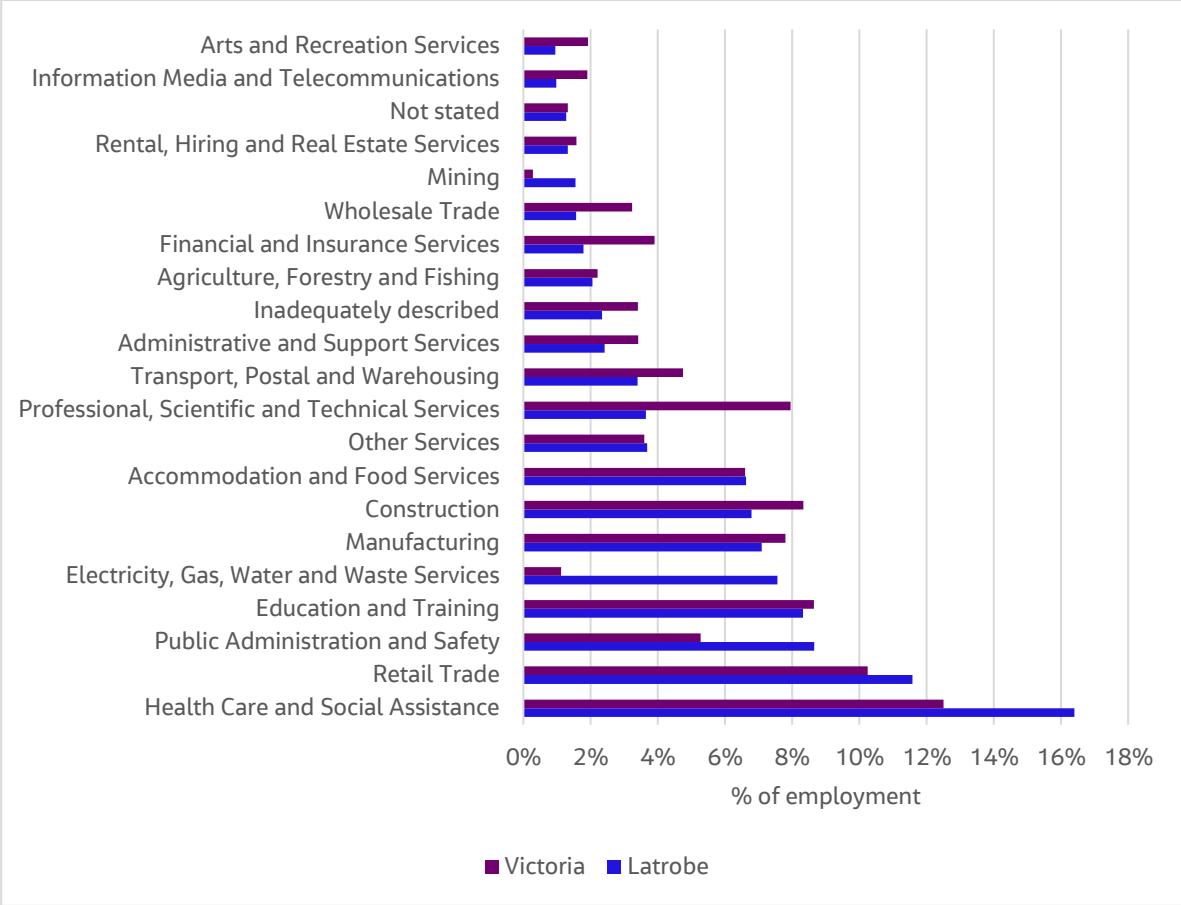


Figure 9: Industries of employment (%), Latrobe and Victoria, 2016

Source: ABS Census of Population and Housing, 2016

Baw Baw

Baw Baw's largest industries of employment are health care and social assistance and agriculture, forestry and fishing, while the electricity, gas, water and waste services sector is significantly smaller than in Latrobe. The proportion of employment in the agriculture, forestry and fishing industry is significantly higher than in Victoria overall. Baw Baw is a nationally significant area for dairy, beef, potatoes and fruits as well as home to many leading horticulture companies (Baw Baw Shire Council, 2018). The region is also known for tourism with attractions including Melbourne's closest downhill ski resort, Mount Baw Baw, and Walhalla and Mountain Rivers (Visit Baw Baw, 2020).

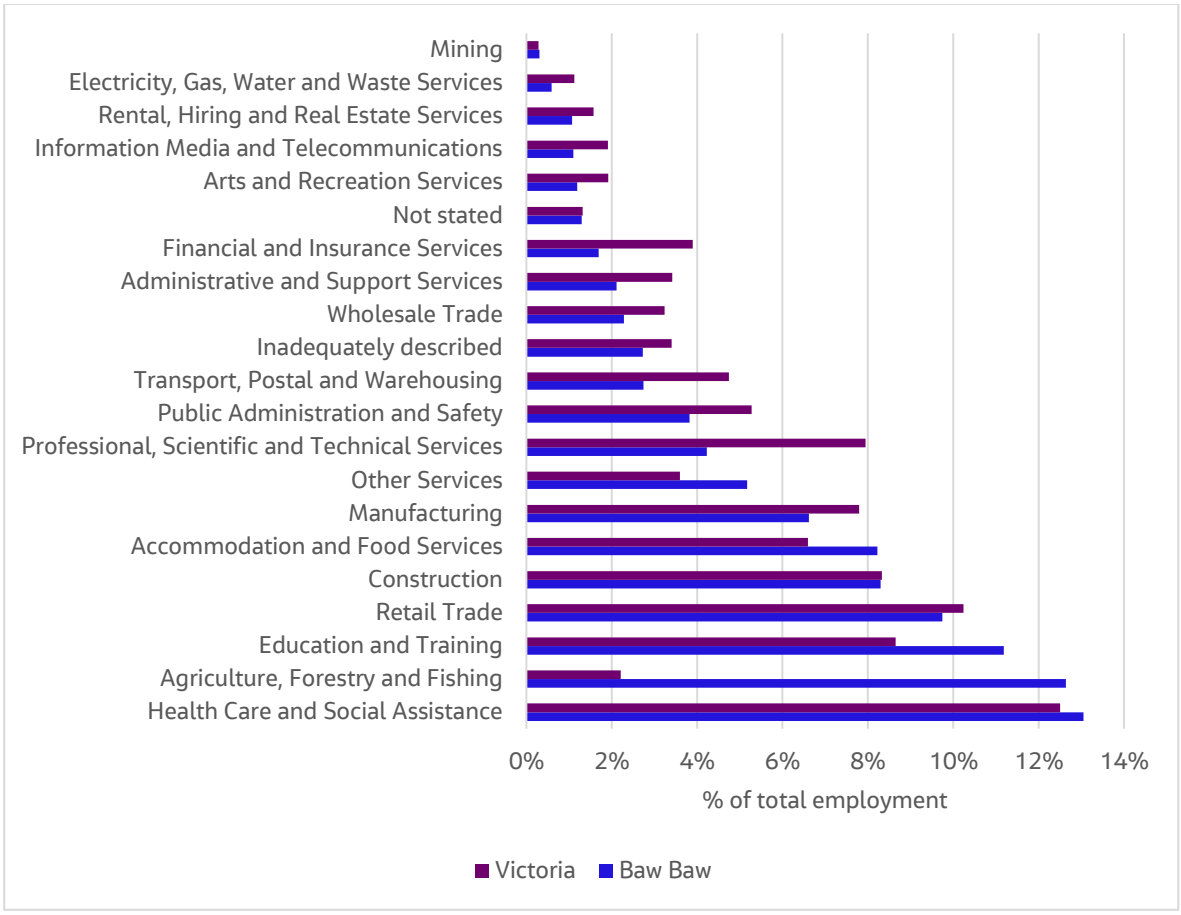


Figure 10: Industries of employment (%), Baw Baw and Victoria, 2016

Source: ABS Census of Population and Housing, 2016

South Gippsland

Agriculture, forestry and fishing is South Gippsland's largest employer, followed by health care and social assistance and retail trade, while the electricity, gas, water and waste services sector contributes only 2% to total employment. The area has one of the highest concentrations of dairy farming in Victoria, employing over 1,400 of the 2,100 employed in the agriculture, forestry and fishing sector. Beef, lamb, snow peas, potatoes and herbs are also produced in South Gippsland, with some of the largest companies including Saputo, Herbzest, Freshzest, Select Produce and Burra Foods (Foster Community Online, 2011). South Gippsland's heavy reliance on agriculture and forestry makes it vulnerable due to the exposure this industry has to climate change impacts such as drought, water scarcity and bushfires.

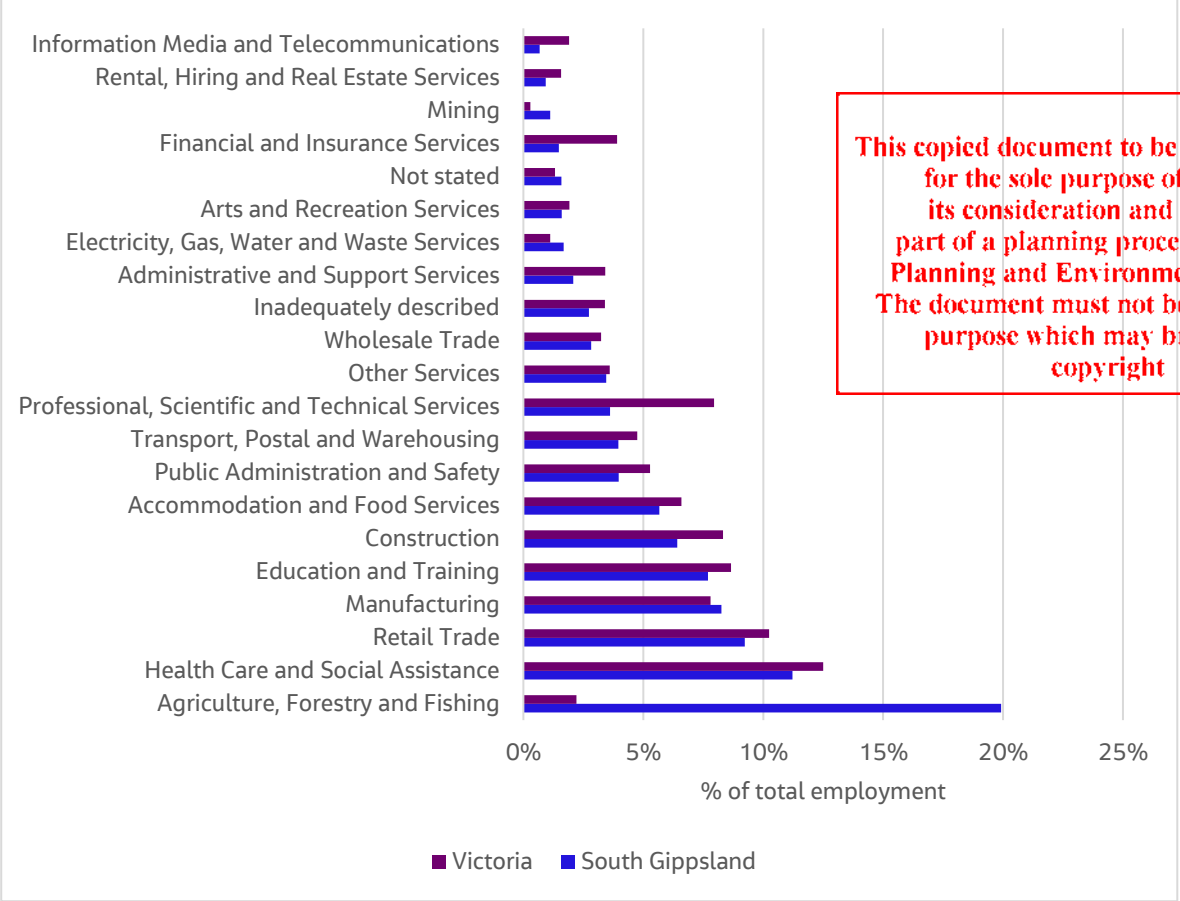


Figure 11: Industries of employment (%), South Gippsland and Victoria, 2016

Source: ABS Census of Population and Housing, 2016

4.4.3 Businesses by employment size range

The majority of businesses within the region are small; however, there are medium sized businesses in industries that could provide a relevant mix of skills and equipment for work on the Project. These businesses employ skilled workers such as project developers, field engineers, managers and consultants, plant operators, construction labourer, apprentices or safety and environmental technicians that would be needed for the Project.

Table 6 shows the number of businesses for some of the industries most relevant to the Project by employment size. There are three businesses with more than 200 employees within the transport, postal and warehousing industry in South Gippsland. There are also a significant number of medium sized (20-199 employees) manufacturing and construction businesses across the region.

Table 6: Number of businesses by industry and size, June 2019

Occupation	Non employing	1-19 Employees	20-199 Employees	200+ Employees	Total
Latrobe					
Manufacturing	63	95	23	0	179
Construction	471	340	18	0	825
Transport, Postal and Warehousing	179	112	8	0	299
Baw Baw					
Manufacturing	105	76	16	0	203

Occupation	Non employing	1-19 Employees	20-199 Employees	200+ Employees	Total
Construction	639	413	6	0	1,059
Transport, Postal and Warehousing	160	126	3	0	289
South Gippsland					
Manufacturing	77	48	6	0	131
Construction	377	191	8	0	578
Transport, Postal and Warehousing	89	74	3	3	159

Source: ABS 8165.0 – Counts of Businesses, including Entries and Exits, June 2015 to June 2019

4.4.4 Employment projections

Due to the COVID-19 pandemic, unemployment in Victoria has increased significantly in 2020 and is expected to take months or even years to recover (Grattan Institute, 2020). Unemployment in Victoria increased from 5.2% in March 2020 to 7.5% in June 2020 (ABSc, 2020) and is expected to rise to 11% in the September quarter of 2019-20 (Department of Treasury and Finance, 2020).

Given the unemployment forecasts for Victoria, it is expected that unemployment rates in Baw Baw Shire, Latrobe and South Gippsland will also increase significantly this calendar year, to about double the rate before the pandemic, and take months or years to recover. These shires have sizeable workforces in the retail and accommodation and food sectors, which have been strongly affected by COVID-19 and associated restrictions. However, Baw Baw and South Gippsland have a relatively high proportion of employment in agriculture, forestry and fishing, so they may experience less unemployment than other parts of the Victoria. Given Latrobe has a relatively high unemployment rate and is ranked as the fourth most disadvantaged LGA in Victoria, it is expected that its employment will be significantly impacted by further falls in economic activity.

Longer term, the continued retirement of coal-fired generation in the region will negatively impact employment. 500 people work in the Yallourn coal-fired plant, which is expected to begin progressively shutting down in 2029, but may close sooner due to climate change policies or if repairs become uneconomic (Carey and Toscano, 2019).

Forecasts for higher unemployment due to the pandemic and the continued retirement of coal-fired generation indicate that workers will be available for the Project and a greater need for work. Importantly, this would mean that new employment opportunities created by the Project will result in a net increase in employment, rather than diverting workers from other projects.

4.5 Income

Latrobe, Baw Baw and South Gippsland all reported lower average incomes than Victoria in the 2016 Census, as shown in Table 7. Median personal incomes ranged from $544 in Latrobe to $585 in Baw Baw, compared with $644 per week for Victoria. Latrobe, Baw Baw and South Gippsland are relatively vulnerable to economic slowdowns and greater unemployment given their lower than average incomes.

Table 7: Median weekly incomes, 2016

	Personal income ($)	Family income ($)	Household income ($)
Latrobe	544	1,415	1,078
Baw Baw	585	1,462	1,196
South Gippsland	537	1,320	1,039

	Personal income ($)	Family income ($)	Household income ($)
Victoria	644	1,715	1,419

Source: ABS Census of Population and Housing, 2016

4.6 Level of socio-economic disadvantage

A community's level of disadvantage or access to economic resources may influence their ability to cope with changes that arise from the Project. The Socio-Economic Indexes for Areas (SEIFA) measure the relative level of socio-economic disadvantage (or advantage) of an area based on a range of characteristics including income, education, occupation, employment and housing conditions. The Index of Relative Socio-Economic Disadvantage (IRSD) summarises variables that indicate relative disadvantage. This index ranks areas on a continuum from most disadvantaged to least disadvantaged so that a lower score indicates a high proportion of relatively disadvantaged people in an area (ABS, 2016).

In the 2016 SEIFA (Profile.id, 2016) the Index of Relative Socio-Economic Disadvantage, Latrobe, Baw Baw and South Gippsland had the following scores:

- Latrobe ranked as the fourth most disadvantaged LGA in Victoria with a score of 931
- Baw Baw ranked in the mid-range with a score of 997
- South Gippsland ranked in the mid-range with a score of 990.

The SEIFA data indicates that Latrobe is relatively vulnerable to economic slowdowns and higher unemployment. It has a higher proportion of people on relatively low incomes, with relatively low educational qualifications, who are unemployed or in lower skilled occupations, and/or crowded and low rental housing compared to the rest of Victoria. Baw Baw and South Gippsland have average levels of access to material and social resources, and ability to participate in society. The Project may provide opportunities for disadvantaged areas with some occupations likely requiring only basic skills and education qualifications, and on-the-job training allowing employees to become more skilled in the field.

4.7 Energy context

The electricity sector in Victoria is undergoing a significant transformation towards renewable generation. The share of renewable energy in Victoria's electricity generation has increased steadily in recent years from around 13 percent in 2013-14 to approximately 21 percent in 2018-19. The major contributor to renewable generation in Victoria over the 2018-19 financial year was wind generation (about half of the 21 percent) (Department of Environment, Land, Water and Planning, 2019).

The growth in renewable generation reflects government climate change policies, the retirement of coal-fired plants and decreased costs for renewable generation. Coal-fired generation plants in Victoria are coming to the end of their life and the most cost-effective replacement for them is a portfolio of renewable generation, energy storage, distributed energy resources (rooftop solar and batteries) and flexible thermal capacity such as gas-powered generation (AEMO, 2018). The Victorian Government is supporting the transformation to renewable generation through renewable energy generation targets (VRET) of 25% by 2020, 40% by 2025 and 50% by 2030. The Victorian Government is also undertaking reverse auctions for renewable generation projects, which provides revenue certainty (Department of Environment, Land, Water and Planning, 2019).

Without adequate growth in renewable generation to offset the impacts of retiring coal-fired power plants, electricity prices will increase and supply will be less reliable. The Yallourn coal-fired power plant in Latrobe is due to start shutting down from 2029. Yallourn generates about 20 per cent of Victoria's energy (Carey and Toscano, 2019). The Hazelwood plant, which had produced 25 per cent of Victoria's electricity, closed in 2017 (Towell, 2019). Wholesale electricity prices were 85% higher on average in 2017 compared with 2016, attributed to the Hazelwood closure (AER, 2018).

A key difficulty in the growth of renewable generation in Victoria is that the current transmission network is unable to support existing and planned renewable generation in many parts of Victoria. The transmission network was not designed to accommodate the volume and mix of power now being generated and transferred, and it is placing prohibitive technical and economic constraints on existing and planned generation (AEMO, 2017). The network constraints are increasing the complexity and uncertainty of investment in new renewable generation. This has material impacts on timing and viability of renewable energy investment in Victoria (AEMO, 2019). There is the risk of electricity not being supplied as overloaded transmission lines can prevent available electricity supply reaching customers (AEMO, 2019b).

There is no difficulty connecting to the transmission network in the Latrobe Valley, yet this area has relatively little renewable energy development. Due to the current and past coal-fired electricity generation in Latrobe, it already has a high-capacity transmission connection to the Victorian grid, as well as a significant number of local employees with relevant skills. However, the Latrobe and Baw Baw LGAs currently have no operating or other proposed wind farms. The South Gippsland LGA has the Toora (21 MW) and Bald Hills (106 MW) wind farms operating, with limited new capacity opportunities due to limitations in the local electrical distribution (sub-transmission voltage) network. Only three of the 26 operating wind farms in Victoria and one of the 18 projects approved or under construction are located in the Gippsland region (Department of Environment, Land, Water and Planning, 2020).

4.8 Summary

The regional socio-economic baseline provides a description of the existing economic conditions in the Latrobe, Baw Baw and South Gippsland LGAs. The key points that are relevant for this Project are:

- Population is growing more slowly than the balance of Victoria in Latrobe and South Gippsland; however, Baw Baw has a significantly greater rate of growth. It is expected these trends will continue in the future. Major projects such as Delburn Wind Farm may help retain population in Latrobe and South Gippsland by providing medium- and long-term employment and income opportunities for existing residents and businesses.
- There is a strong need for projects to support the GRP in each of Baw Baw, Latrobe and South Gippsland. Their economies are expected be negatively impacted to a significant degree by the COVID-19 pandemic over the current and next financial year. There is also a need to continue diversifying the region's economy ahead of the planned retirements of coal-fired generation in the Latrobe Valley.
- While unemployment rates have decreased over recent years, due to the COVID-19 pandemic, it is expected that unemployment rates in Baw Baw, Latrobe and South Gippsland will increase significantly in line with Victoria, to about double the rate before the pandemic. Higher unemployment will increase the available workers for the Project and the need for work.
- Within these LGAs, there is a relatively high proportion of labourers, technicians and trades workers to provide a talent pool for the type of workers that will be needed for the Project. There are also medium sized businesses within the transport, postal and warehousing industry in South Gippsland and within the manufacturing and construction businesses across the region to support the delivery of the Project.
- Latrobe, Baw Baw and South Gippsland are relatively vulnerable to economic slowdowns as they have lower average incomes than Victoria and Latrobe also have a high relative level of socio-economic disadvantage.
- The Project location represents an excellent opportunity for renewable generation in Victoria given it already has a high-capacity transmission connection to the Victorian grid as well as a significant number of local employees with relevant skills.

5. Project assumptions

This chapter outlines the key assumptions about the Project used to inform the impact analysis.

5.1 Timelines

The assumptions about the Project's timelines used in this assessment are outlined Table 8.

Assumption	Description
Construction phase	▪ 24 months (estimate provided by client is 18 to 24 months)
Operation phase	▪ 30 years (estimate provided by client was 25 to 30 years)

5.2 Direct expenditure

The assumptions about the Project's expenditure used in this assessment are outlined Table 8.

Table 8: Modelling assumptions

Assumption	Description
Construction costs	▪ $358 million split evenly across the 24 months of construction (based on a 'bottom up' estimate by the client; range of $320-$360m possible) ▪ $10 million will be spent on development, $308 million on capital works and $40 million on grid connection.
Operation costs	▪ $7.4 million per year for the operating period ▪ OSMI Australia estimates that operation costs will comprise repairs and maintenance and professional services.

5.3 Industry allocation of expenditure

OSMI Australia provided a simple breakdown of construction costs for a better understanding of how their expenditure would be spent. This included expenditure on Development, EPC (Engineering, Procurement, Construction) and Grid connection. The operational costs were not split into type of cost by OSMI Australia.

To estimate the value added and employment impact of the Delburn Wind Farm, the construction breakdown provided has been split into the ABS Standard Industrial Classifications, as shown in Table 9. The ABS industry classification split for the operational expenditure has been estimated based on the expected type of ongoing costs the Project may have. The multipliers have then been applied to these industries to understand the impact of the Delburn Wind Farm.

Table 9: Industry allocation of expenditure

Phase	Cost breakdown[5]	% of cost	Relevant ABS industry	Total expenditure ($m)
Construction phase (total cost)	Development	3%	Professional, scientific and technical services	7.7
			Accommodation and food services	2.6
	EPC (wind turbine supply and install plus civil and electrical BoP)	86%	Manufacturing	184.6
			Construction	123.1
	Grid connection	11%	Manufacturing	23.9

[5] Provided by OSMI Australia

Phase	Cost breakdown[5]	% of cost	Relevant ABS industry	Total expenditure ($m)
			Construction	16.0
	Total	**100%**	**Total**	**357.9**
Operation phase (per annum)	All operational costs	100%	Other services (inc. maintenance)	7.0
			Professional, scientific and technical services	0.4
	Total	**100%**	**Total**	**7.4**

Source: Clean Energy Council, Clean Energy Australia report 2019, ABS Industry Classifications

5.4 Location of expenditure

The economic impact assessment is primarily interested in the impacts within the three LGAs, which is based on the level of direct expenditure that occurs in these LGAs. Some of the direct expenditure will be spent outside of the three LGAs – in other parts of Victoria, Australia and overseas, such as on the manufacture of turbines and some of the other construction costs. The Gippsland region will, however, benefit from the installation of the turbines and other capital spend for the Project.

The capital and operating expenditure for the Project has been split by location as shown in Table 10, based on the Clean Energy Council report '*Wind farm investment, employment and carbon abatement in Australia*'. It should be noted that this source is from 2012 and the distribution of expenditure may have changed since then. Given the capability of the nearby towns it is expected that the reported results of local and regional benefits are understated.

Table 10: Expenditure by location, construction and operation phases

	% of total	$m	% of total	$m
	Construction phase		**Operation phase**	
Overseas	38%	136.0	0%	0.0
National	20%	71.6	58%	4.3
State	27%	96.6	14%	1.0
Region	15%	53.7	28%	2.1
TOTAL	100%	357.9	100%	7.4

The split of regional expenditure and employment across the Latrobe, Baw Baw and South Gippsland LGAs is outlined in Table 11. The indicative split across the LGAs is based on the relative size of their major population centres closest to the Project, covering Morwell, Moe, Traralgon, Boolarra, and Yinnar in Latrobe Council; Leongatha and Mirboo North in South Gippsland Shire; and Thorpdale, Trafalgar and Warragul in Baw Baw Shire.

Table 11: Regional populations centres surrounding the Project

	Latrobe	Baw Baw	South Gippsland	Total
Population centres close to the Project	49,363	20,143	8,076	77,582
% of Total	64%	26%	10%	100%

6. Impact Assessment

This section discusses the impact of the Project on the regional economy during construction and operation. It considers the impact on value-added output, employment and the effects on incomes, property values, the Victorian energy market and the general community.

As stated in Section 3.2.1, two different tools have been used to estimate regional and state impacts respectively, as the tool used to estimate regional impacts does not estimate impacts at the Victorian level. To estimate the impact on the three LGAs, the Economic Impact Analysis Tool, developed at Flinders University, was used. At the state level, the Clean Energy Council method is used, which is based on a per MW basis. The Clean Energy Council method also does not provide Gross State Product impacts from operational expenditure and therefore this report does not provide Gross State Product from operational expenditure.

Using the CEC method for the regional impact, both total employment and GRP value-added are higher than forecast by the Flinders University Analysis Tool, so using the Flinders University Analysis Tool for this regional impact analysis is conservative. Although the data in the CEC report is specific to Australian wind farms, it is older data and only provides a general regional estimate.

6.1 Economic impact

6.1.1 Gross Regional Product impact – Flinders University tool

The combined construction and operations of the Delburn Wind Farm are expected to create an increase in GRP (value-added) to the three LGAs of $106 million over the 32-year period:

- The estimated value-added impact during the construction phase is about $45 million (approximately $23 million spent annually over two years).
- During the operation phase, the regional value-added impact is expected to be about $2.1 million annually. Over the 30-year expected life of the Project, this would result in additional Gross Regional Product of about $62 million.

Table 12 shows the calculated annual value-added impact to each of the LGAs.

Table 12: Annual regional value-added impact ($m)

Annual impact ($m)	Latrobe	Baw Baw	South Gippsland	Total
Construction phase (2 years)				
Direct value-added	5.2	2.1	0.9	8.2
Indirect value-added	9.2	3.5	1.5	14.2
Total value-added	14.4	5.7	2.3	22.5
Operation phase (30 years)				
Direct value-added	0.7	0.3	0.1	1.1
Indirect value-added	0.6	0.3	0.1	1.0
Total value-added	1.3	0.5	0.2	2.1

Note: some small rounding errors.

Table 13 shows the NPV of the value-added impact for both phases of the Project, assuming the construction phase occurs from 2022 to 2023 and the operation period occurs for 30 years beginning in 2024. The Net Present Value (NPV) is a method of showing all future cash flows generated by a project in present value terms. A discount rate of 7% (DTF, 2013) has been used.

Table 13: NPV of Project regional value-added impact

NPV ($m)	Latrobe	Baw Baw	South Gippsland	Total
Construction phase (2022-23)	24.4	9.6	4.0	38.0
Operation phase (2024-2053)	13.2	5.4	2.1	20.8

The development of the Delburn Wind Farm will also have other economic benefits that have not been quantified. It will help to diversify the economy in the region ahead of the continued planned retirements of coal-fired generation in the Latrobe Valley. It could also act as a catalyst for further renewable generation projects in the area; for instance, OSMI Australia is actively investigating the feasibility of forestry-based wind farms throughout the Gippsland region that have access to existing transmission networks and commercially viable wind resources.

6.1.2 Regional employment impact – Flinders University tool

The development of the Delburn Wind Farm will generate employment for the region, utilising the available labour supply with existing skills in energy generation. The types of workers required to construct the wind farm are expected to include: project developers, field engineers, managers and consultants, plant operators and construction labourers, apprentices, safety and environmental technicians and contractors.

Most employees will be sourced from the Latrobe, Baw Baw and South Gippsland LGAs, as outlined in Section 5.4. With the Latrobe LGA suffering from relatively high unemployment (Section 4.4) and the COVID-19 pandemic, there is expected to be sufficient labour market capacity for the Project. In addition, the three LGAs have a range of businesses with the capacity to provide services to the Project and individuals with skills to meet employment requirements (Section 4.4.1 and 4.4.3).

The expected total annual impact of the Project on employment is expected to reach up to 186 FTE jobs per year during the 24 month construction phase and up to 25 FTE jobs each year during operations, as outlined in Table 14. As calculated through the Economic Impact Analysis Tool, the construction phase of the Project is expected to have a peak level of direct employment of 74 new FTE jobs. In the operation phase, 17 FTE employees are expected to be directly employed and this is likely to remain relatively consistent over the 30-year period. These direct employment impacts are then multiplied through the Economic Impact Analysis Tool to determine the total employment impact over the construction and operation phases.

Table 14: Annual regional employment impact

Annual impact (FTE)	Latrobe	Baw Baw	South Gippsland	Total
Construction phase				
Direct employment	46.9	19.1	7.7	73.6
Indirect employment	70.0	30.1	12.1	112.2
Total employment	116.9	49.2	19.8	185.8
Operation phase				
Direct employment	10.5	4.3	1.7	16.5
Indirect employment	5.3	2.2	0.8	8.3
Total employment	15.8	6.5	2.6	24.9

Note: some small rounding errors.

6.1.3 Gross State Product impact – Clean Energy Council method

As described in Section 3.2.1, the CEC report has been used to assess the value-add and employment impact on Victoria. The state impact assesses all of Victoria, including Latrobe, Baw Baw and South Gippsland.

The estimated value-added impact within Victoria during the construction phase is about $401 million (approximately $200.7 million spent annually over two years). This is assuming the Delburn wind farm has a 200 MW capacity. The total impacts are outlined in Table 15.

The Clean Energy Council method does not provide Gross State Product impacts from operational expenditure and therefore this report does not provide Gross State Product from operational expenditure. The construction impact is most important as it would have a greater impact on Gross State Product than the operational phase, as per the regional impacts.

Table 15: Total construction state value-added impact (nominal and NPV)

Total construction impact ($m)	Total (nominal) $m	NPV $m
Direct value-added	130.8	110.5
Indirect value-added	270.6	228.7
Total value-added	401.4	339.2

6.1.4 State employment impact – Clean Energy Council method

Assuming a MW capacity of 200 MW, the expected total annual impact of the Project on state employment is expected to reach up to 2,016 FTE jobs per year during the 24-month construction phase and up to 76 FTE jobs each year during operations, as outlined in Table 16.

Table 16: Annual state employment impact

Annual impact (FTE)	Total
Construction phase	
Direct employment	588
Indirect employment	1,428
Total employment	2,016
Operation phase	
Direct employment	28
Indirect employment	48
Total employment	76

6.1.5 Qualitative assessment of the wind farm impact on the region

This section outlines the related industries in the area that would be expected to benefit most from the Project.

Accommodation, food services and retail trade

There is expected to be some increase in demand from short term accommodation in nearby towns as suppliers visit the site and potentially for some specific employees that relocate for a period. Permanent staff relocating for the project are expected to be located within a 30-minute drive. There are a number of small accommodation businesses in the regional towns closest to Delburn Wind Farm such as Mirboo North, Boolara, Yinnar, Churchill,

Morwell, Yallourn, Thorpdale, Trafalgar, Moe, Yarragon, Leongatha and Traralgon. The uplift in occupation due to wind farm workers would likely significantly impact these operators' businesses.

There would also be an impact on demand for food services and retail trade from suppliers and employees of the wind farm. There are nearby food stores, cafes, bakeries, pubs, breweries and restaurants that may benefit from the project. Retail trade would benefit from workers spending more in nearby regional towns such as at fuel stations.

Construction and manufacturing

These industries would benefit if the Project uses local contractors and manufacturers during construction such as developing foundations, cable laying and other electrical works, equipment manufacture and local road upgrades.

Rental, hiring and real estate services and wholesale trade

Rental, hiring and wholesale trade businesses in the region may benefit through rental or purchase of machinery and equipment during construction such as ladders and platforms, and for repairs and maintenance during operation.

Transport and logistics

The transport and logistics industry would benefit from delivery of parts, particularly during construction.

Repairs and maintenance

Local repairs and maintenance businesses in the region may benefit from the repairs and maintenance during operation of the wind farm, such as repairs of roads, vehicles and equipment.

6.2 Property value impact

A key issue raised during the planning phase of the Delburn wind farm is the effect on property prices in the surrounding region from the wind farm. The impact on property prices is a highly contentious and widely debated topic in relation to wind farms.

The literature indicates it is unlikely there will be any adverse impact on property prices at any stage of the Delburn Wind Farm's development. There is little evidence of impacts on property prices within the vicinity of a wind farm. The key factors are the proximity of properties to the wind farm and the nature of the properties. There are no dwellings within 1km of the proposed Delburn wind farm and the wind farm is located within a rural area, amongst timber plantations. Although there are many sources of literature on this topic, the studies that discussed below are seen to be the most recent and relevant studies.

An Australian government inquiry into the social and economic impacts of rural wind farms in 2010 found that it is possible the value of some properties that are close to turbines may be adversely affected, but there are setbacks and other measures required through the planning process designed to avoid this. The enquiry considered a large number of studies including Australian and international studies as well as anecdotal evidence (Community Affairs Committee, 2011). A key study reviewed as part of the inquiry was the NSW government '*Preliminary Assessment of the Impact of Wind Farms on Surrounding Land Values in Australia*'. Based on a literature review and preparation of eight case studies in NSW and Victoria, the study concluded that there is no evidence that wind turbines cause property values in their vicinity to reduce. The study included consideration of the contribution of various factors (including distance to a wind farm, view of a wind farm, and land use) to any price changes (NSW Department of Lands, 2009).

A 2014 study from the UK's Centre for Economics and Business Research '*The effect of wind farms on house prices*' found no evidence that house prices had been affected by the announcement, construction or completion of the wind farms for six of the seven sites studied. The study analysed house price growth for transactions within a 5km radius for seven wind farm sites. For each site, it compared house price changes in the immediate vicinity

of the wind farm with those in the wider area from January 1995 to mid-2013. The study found that the announcement, construction or completion of the wind farms caused no statistically significant negative impact to price growth within a 5km radius of the wind farm.

A 2016 study by Urbis Pty Ltd on behalf of the NSW Office of Environment and Heritage found that appropriately located wind farms within rural areas, removed from higher density residential areas, are unlikely to have a measurable negative impact on surrounding land values. The key consideration is the proximity to residential properties. The study included a literature review of existing international and Australian reports and papers and the preparation of six case studies in NSW and Victoria, including analysis of sales data of properties near wind farms over the past 15 years to identify any differences between wind farm impacted properties and the broader property sales market. There are a small number of overseas studies finding a property value reduction associated with the development of a wind farm; however, these countries have situated wind farms closer to small urban centres or villages than the proposed Delburn Wind Farm and most studies have essentially supported the notion that wind farms have a limited impact on property values. The study's results are in line with that of the 2009 NSW Valuer-General's assessment.

6.3 Income impact

The owner of the timber plantation used for the proposed wind farm and neighbouring dwelling owners will receive income from the wind farm. The timber plantation owner will receive an annual lease payment. For the purposes of this assessment, $7,500 per MW is the assumed income paid to the landowner, who would therefore receive $1.5 million[6] per annum to have the wind turbines and associated infrastructure located on their land. There will be minimal reduction in their timber revenue as it is expected the turbines will coexist alongside the timber trade. Additionally, OSMI has advised that the 103 neighbouring dwelling owners within 2 km of a wind turbine will receive a combined approximate $500,000 per annum in neighbour profit share contributions. Some of this contribution may compensate a perceived loss in property value, however it is likely the majority will be recognised as additional income.

The Project is expected to provide further benefits to forestry operators, who have been impacted by bushfires and drought over the past decade, by providing employment opportunities and diversifying the land use base over their assets. It is likely operators in this industry will take a negative hit to their profits in the coming years due to these natural disasters. The landowner of Delburn Wind Farm will benefit from a secure diversified income stream.

The construction and operational labour force employed will benefit from their wages from the wind farm. Incomes paid in both construction and operation phases of the Project are expected to average around $1,334 per week (ABS, 2017), based on the types of employees required and 2016 Australian incomes. The average earnings for the Project are significantly higher than the existing median weekly earnings of Latrobe, Baw Baw and South Gippsland at $544, $585 and $537 per week respectively (Section 4.5). Therefore, Latrobe, Baw Baw and South Gippsland LGAs are likely to experience an increase in median incomes during the construction phase and in the operating years following.

6.4 Community impact

In addition to the economic impacts already discussed, the Delburn Wind Farm will provide many additional community benefits:

- A Community Development Fund to support community and environmental programs such as habitat restoration and tree planting, using local contractors or community groups, within the surrounding communities of the wind farm. The project will contribute approximately $150,000 per annum to the fund.
- 6.2km of local road upgrades and repairs, which are needed to support the construction of the wind farm.
- $403,000 in municipal charges under the Electricity Act, which will go to Latrobe, Baw Baw and South Gippsland Shire Councils

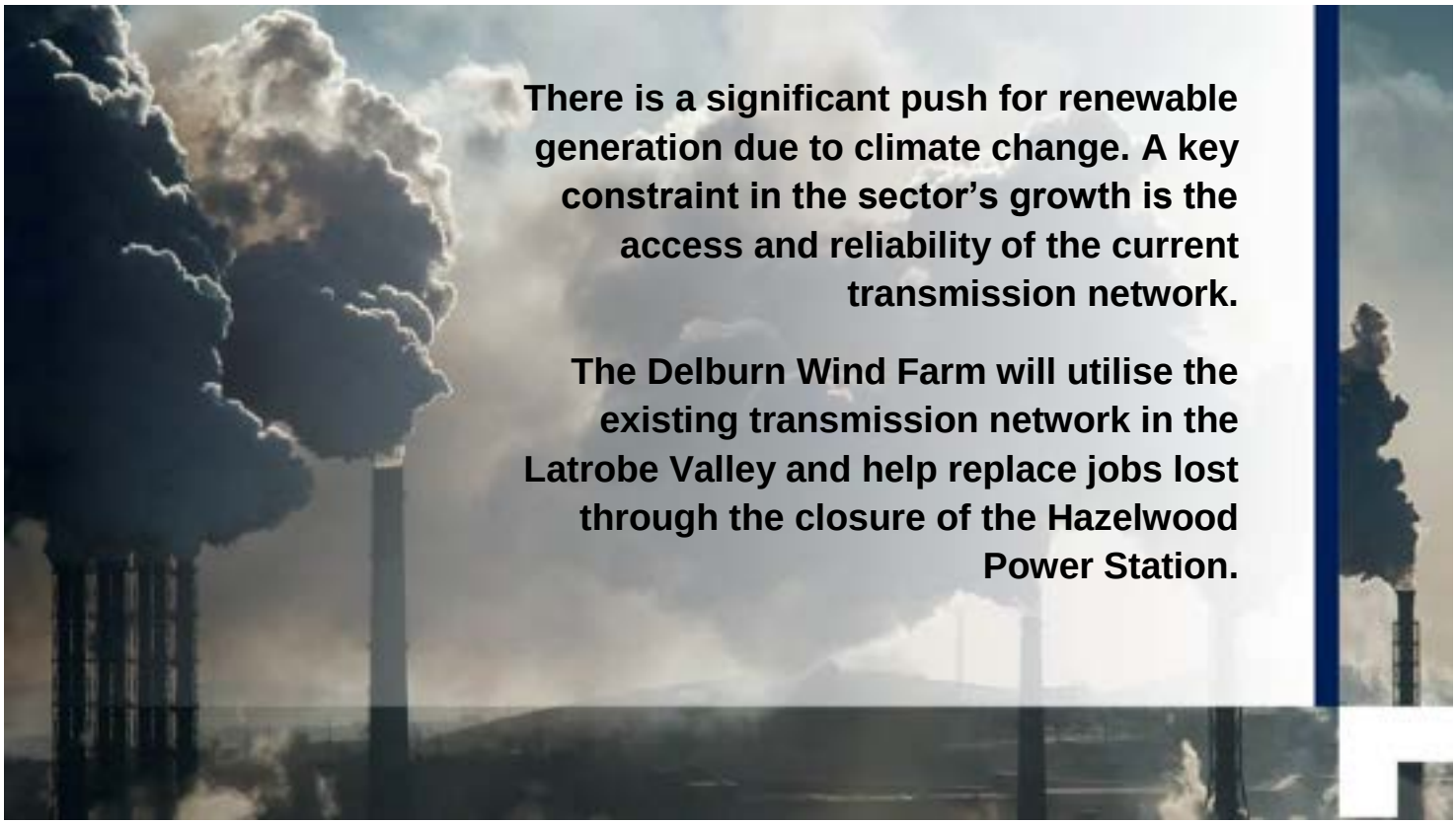
[6] Based on 33 turbines with approximate capacity of 200 MW

- Major projects such as Delburn Wind Farm may help retain population in Latrobe and South Gippsland by providing medium- and long-term employment and income opportunities for existing residents and businesses.
- Tourism benefits associated with the project, particularly with the plantation's open access nature and provision of a visitor information centre for the project (to be located on Smiths Road).

6.5 Energy impact

The Delburn Wind Farm will help to increase the renewable energy production in Victoria, which is needed to meet Victorian Government renewable energy targets and to replace the electricity that will be lost from retirement of coal-fired power stations in Victoria. The Delburn Wind Farm will generate approximately 590,000 MWh of renewable energy each year.

Delburn Wind Farm will utilise Latrobe's significant access to the transmission network and will help to replace jobs lost through the closure of Hazelwood Power Station. It may also stimulate further renewable projects in the region through acting as a catalyst; for instance, OSMI Australia is actively investigating the feasibility of forestry-based wind farms throughout the Gippsland area that have access to existing transmission networks and commercially viable wind resources.



6.6 Environmental impact

Energy market modelling has not been undertaken to assess the impact on the energy market impacts; however, it is clear there is potential for the Project to reduce the amount of carbon dioxide released into the atmosphere due to its renewable generation. Depending on the impact of the Project on the mix of power generation in Victoria, it has the potential to reduce carbon emissions by up to approximately 590,000 tonnes per annum, compared to the weighted average emissions intensity of Victorian generation plants. According to the Clean Energy Regulator's tenth Emissions Reduction Fund auction in March 2020 (Clean Energy Regulator, 2020), the

average price per tonne of carbon abatement is $16.14. Therefore, the Project could produce benefits of up to approximately $9.5 million each year[7], or $285.7 million over the project's 30-year life.

[7] Calculated as 590,000 tonnes of carbon multiplied by the value of carbon abatement

7. Conclusion

The Project is expected to deliver substantial ongoing economic benefits to the Latrobe, Baw Baw and South Gippsland LGAs. It will create a new source of employment in the region and deliver a significant amount of investment into the regional economies at a time of an economic slowdown and relatively high unemployment. The Project will leverage existing transmission assets and utilise local skilled labour. From a regional, State and national perspective, the Project will contribute to the achievement of renewable energy generation targets.

The main quantified benefits of the Project are:

- $45 million in additional GRP, creating approximately 186 jobs (includes direct and flow-on effects), during the construction phase.
- $2.1 million in additional GRP per annum over the 30-year operational phase, creating 25 new ongoing jobs (includes direct and flow-on effects). The jobs created will be paid above-median wage rates.
- About $401 million (approximately $200.7 million spent annually over two years) in additional GSP, creating up to 2,016 FTE jobs per year during the 24-month construction phase and up to 76 FTE jobs each year during operations.
- Significant financial transfers to the local community through payments to the neighbouring properties ($500,000 per annum in neighbour profit share), 6.2 km of local road upgrades, the development of a $150,000 per annum Community Development Fund and $403,000 in municipal charges to the three Councils.
- $9.5 million each year in carbon dioxide abatement, or $285.7 million over the project's 30-year life.

8. References

ABS. (2016) *Technical Paper Socio-Economic Indexes for Areas (SEIFA) 2016 2033.0.55.001*. https://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/756EE3DBEFA869EFCA258259000BA746/$File/SEIFA%202016%20Technical%20Paper.pdf

ABS. (2017). *6306.0 - Employee Earnings and Hours, Australia, May 2016*. https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6306.0May%202016?OpenDocument

ABS. (2020). *Community Profile Series, Census of Population and Housing.* https://www.abs.gov.au/websitedbs/D3310114.nsf/Home/Census?OpenDocument&ref=topBar

ABS. (2020a). *3218.0 - Regional Population Growth, Australia, 2014-15, Population Estimates by Local Government Area, 2005 to 2015*. https://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/3218.0Main%20Features152014-15?opendocument&tabname=Summary&prodno=3218.0&issue=2014-15&num=&view

ABS. (2020b). *3218.0 - Regional Population Growth, Australia, 2018-19: Population Estimates by Local Government Area, 2018 to 2019*. https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3218.02018-19?OpenDocument

ABS. (2020c). *6202.0 - Labour Force, Australia, June 2020: Table 5. Labour force status by Sex, Victoria - Trend, Seasonally adjusted and Original.* https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6202.0Jun%202020?OpenDocument

ABS. (2020d). *8165.0 – Counts of Businesses, including Entries and Exits, June 2015 to June 2019: Data Cube 10: Businesses by Industry Division by Local Government Area (LGA) by Employment Size Range.* https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8165.0June%202015%20to%20June%202019?OpenDocument

AEMO. (2017). *Western Victoria Renewable Integration: Project Specification Consultation Report*. https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/Victorian_Transmission/2017/Western-Victoria-Renewable-Integration---Project-Specification-Consultation-Report_FINAL.pdf

AEMO. (2018). *Integrated System Plan 2018.* https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/ISP/2018/Integrated-System-Plan-2018_final.pdf

AEMO. (2019). *Victorian Annual Planning Report 2019.* https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/VAPR/2019/Victorian-Annual-Planning-Report-2019.pdf

AEMO. (2019b). *Load Shedding in Victoria on 24 and 25 January 2019*. https://www.aemo.com.au/-/media/Files/Electricity/NEM/Market_Notices_and_Events/Power_System_Incident_Reports/2019/Load-Shedding-in-VIC-on-24-and-25-January-2019.pdf

AER. (2018). *AER electricity wholesale performance monitoring: Hazelwood advice*. https://www.aer.gov.au/system/files/AER%20electricity%20wholesale%20performance%20monitoring%20-%20Hazelwood%20advice%20-%20March%202018_0.PDF

Australian Urban Research Infrastructure Network. (2020). *Input-Output Multipliers*. http://eiat.aurin.org.au/#/eiat/analysis

Australian Urban Research Infrastructure Network. (2020b). *Economic Impact Analysis Tool*. http://eiat.aurin.org.au/#/eiat/home

Baw Baw Shire Council. (2018). *Economic Development Strategy 2018-2021.* https://www.bawbawshire.vic.gov.au/files/sharedassets/public/economic-development/documents/economic-development-strategy-2018-21-print-version.pdf

Carey, A. and Toscano, N. (2019, June 25). Yallourn coal-fired power plant due to shut down from 2029. *The Age.* https://www.theage.com.au/politics/victoria/yallourn-coal-fired-power-plant-due-to-shut-down-from-2029-20190625-p5212q.html

Centre for Economics and Business Research. (2014). *The effect of wind farms on house prices*. http://www.cebr.com/

Chalmers, S. (2020, 12 May). Coronavirus lockdown inspires home improvement, as consumer spending rebounds. *ABC News*. https://www.abc.net.au/news/2020-05-12/spending-momentum-improves-cba-coronavirus-recovery/12237772

Clean Energy Council. (2012). *Wind farm investment, employment and carbon abatement in Australia.*

Clean Energy Council. (2019). *Clean Energy Australia report 2019*

Clean Energy Regulator. (2020). *Emissions Reduction Fund Auction March 2020.* http://www.cleanenergyregulator.gov.au/ERF/Auctions-results/march-2020

Community Affairs Committee. (2011). *The Social and Economic Impact of Rural Wind Farms, Chapter 4.* https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Community_Affairs/Completed_inquiries/2010-13/impactruralwindfarms/report/~/media/wopapub/senate/committee/clac_ctte/completed_inquiries/2010-13/impact_rural_wind_farms/report/c04.ashx

Department of Education, Skills and Employment. (2020). *Small Area Labour Markets – March Quarter 2020.* https://docs.employment.gov.au/documents/lga-data-tables-small-area-labour-markets-march-quarter-2020

Department of Environment, Land, Water and Planning. (2019). *Victoria in Future 2019: Data for Local Government Areas (LGA) and Victoria in Future Small Areas (VIFSA).* https://www.planning.vic.gov.au/land-use-and-population-research/victoria-in-future

Department of Environment, Land, Water and Planning. (2019a*). Victorian Renewable Energy Target 2018-19 Progress Report.* https://www.energy.vic.gov.au/__data/assets/pdf_file/0030/439950/Victorian-Renewable-Energy-Target-2018-19-Progress-Report.pdf

Department of Environment, Land, Water and Planning. (2020). *Wind Energy Projects.* Retrieved from: https://www.planning.vic.gov.au/permits-and-applications/specific-permit-topics/wind-energy-facilities/wind-energy-projects-planning

Department of Treasury and Finance. (2013). Economic Evaluation for Business Cases Technical guidelines. https://www.dtf.vic.gov.au/investment-lifecycle-and-high-value-high-risk-guidelines/stage-1-business-case

Department of Treasury and Finance. (2020). *Coronavirus Economic Outlook Fact Sheet. https://www.dtf.vic.gov.au/sites/default/files/document/Coronavirus%20Economic%20Outlook%20-%20Fact%20Sheet.pdfMay*

Foster Community Online. (2011). *Major Employers in our area.* https://foster.vic.au/major-employers-in-our-area/

Grattan Institute. (2020). *Shutdown: estimating the COVID-19 employment shock*. https://grattan.edu.au/wp-content/uploads/2020/04/Shutdown-estimating-the-COVID-19-employment-shock-Grattan-Institute.pdf

Latrobe City Council. (2020). *Novel Coronavirus (COVID-19) Information.* https://www.latrobe.vic.gov.au/Community/Emergencies/Novel_Coronavirus_COVID_19_Information

NSW Department of Lands. (2009). *Preliminary assessment of the impact of wind farms on surrounding land values in Australia.* https://www.valuergeneral.nsw.gov.au/__data/assets/pdf_file/0006/195315/Preliminary_assessment_impact_of_wind_farms_on_surrounding_land_values_in_Australia.pdf

Premier of Victoria. (2016). *Economic Growth Zone To Boost Latrobe Valley Business*. https://www.premier.vic.gov.au/economic-growth-zone-to-boost-latrobe-valley-business/

Premier of Victoria. (2020). *Victorian Economy Geared To Weather The Storm*. https://www.premier.vic.gov.au/victorian-economy-geared-to-weather-the-storm/

Profile.id, (2016). *Community Profile – South Gippsland Shire.* https://profile.id.com.au/south-gippsland/seifa-disadvantage

Raducan, G. (2018). *The Impact of Bushfires on Water Quality*, Research Gate. https://www.researchgate.net/publication/327497948_The_Impact_of_Bushfires_on_Water_Quality

RDV. (2020). *Latrobe Valley Economic Development Program.* https://www.rdv.vic.gov.au/grants-and-programs/latrobe-valley-economic-development-program

Remplan. (2020) *Economy Profiles – Latrobe.* https://app.remplan.com.au/latrobe/economy/summary?state=PZg7FAXMnFAb12nf6Gj30JT1HPHqzj

Remplan. (2020b) *Economy Profiles - Baw Baw.* https://app.remplan.com.au/bawbaw/economy/summary?state=vNAmFxq8NsJRAgRSmOdqDPtgHzHYm7

Remplan. (2020c) *Economy Profiles – South Gippsland.* https://app.remplan.com.au/southgippsland/economy/summary?state=ZmY8TV3M6C3LxBYtgdXdPwFjhnhEQR

Towell, N. (2019, 18 November). Coal on 'life support': unions demand closure deal at Yallourn. *The Age.* https://www.theage.com.au/national/victoria/coal-on-life-support-unions-demand-closure-deal-at-yallourn-20191118-p53bpz.html

Urbis Pty Ltd. (2016) *Review of the Impact of Wind Farms on Property Values.* https://www.environment.nsw.gov.au/resources/communities/wind-farm-value-impacts-report.pdf

Visit Baw Baw. (2020). *Visit Baw Baw – Closer Than You Think*. https://www.visitbawbaw.com.au/

Whittaker, J. (2019). *Latrobe Valley optimistic two years after Hazelwood power station closure, but coal attachment remains*, ABC Gippsland. https://www.abc.net.au/news/2019-03-18/hazelwood-power-station-closure-two-years-on/10908866

Appendix A. Alternative method

Clean Energy Council report

The Clean Energy Council report 'Wind Farm Investment, Employment and carbon abatement in Australia' provides an alternative method for calculating the estimated economic impacts of the Project. In this report, the impact on regional, state and national employment is estimated based on a per MW basis. In Table A.1 and Table A.2 the per MW regional impact is extrapolated to the installed capacity of the Project (200 MW).

Table A.1: Alternative employment impact

Annual impact (FTE)	Regional (200 MW) impact FTE
Construction phase	
Direct employment	192.0
Indirect employment	450.0
Total employment	640.0
Operation phase	
Direct employment	18.0
Indirect employment	32.0
Total employment	50.0

Table A.2: Alternative regional value-added impact

Annual impact ($m)	Regional (200 MW) impact $m
Construction phase	
Direct value-added	19.6
Indirect value-added	40.5
Total value-added	60.1

Using this method, both total employment and total GRP are higher than forecast by the Flinders University Analysis Tool. The multipliers used in this method are based on data provided by the Clean Energy Council and analysis performed by Jacobs (formerly SKM). Although this data is specific to Australian wind farms, it only provides a general regional estimate and does not take into consideration the local government areas that are impacted.