# Economic impact assessment of
# **Oaklands Hill and Macarthur wind farms**

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SKM



# Contents



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# 1. Definitions

**Construction** includes all activities required to design, procure and construct the project.

**Development** includes all activities required to progress the project to the point where a business case is presented for Board approval. Typically, development activities would include attaining all required permits and authorisations, implementing a wind monitoring programme, procuring a design and construct contractor and negotiating a Transmission Connection Agreement.

**Direct Employment** includes the employees who are directly employed in developing, constructing and/or operating the wind farms and those directly employed in manufacturing wind farm plant and equipment supporting these activities.

**Gross Regional Product (GRP)** is the total market value of goods and services produced in a region after deducting the costs of goods used up in the process of production (intermediate Consumption) but before deducting consumption of fixed capital (depreciation).

**Gross Value Added (GVA)** is defined as total factor income plus taxes and less subsidies on production. Total factor income is made up of compensation of employees, gross operating surplus and gross mixed income.

**Indirect Employment** is generated from the expenditure of flow on activities from developing, constructing and operating wind farms (i.e. jobs generated in the supply chain and supporting industries) including expenditure by suppliers of components for wind farm manufacture needed to replace materials used up in the manufacturing process such as steel, reinforcing bars, paint etc.

**Induced Employment** is generated by the expenditure of the wages and salaries by households in response to income changes resulting from direct and indirect impacts.

**Operation phase** commences on issue of the Practical Completion certificate for the project. The Operational phase for a wind farm is typically 20 to 25 years.

**Region** means the local government areas of Southern Grampians Shire, Moyne Shire, Glenelg Shire and Warrnambool City.

**Total Expenditure** is the total amount spent on the direct development, construction and operations of the wind farms.



# 2. Executive Summary

## 2.1. Oaklands Hill wind farm

Oaklands Hill wind farm was completed in February 2012 and had been in operation for approximately 6 months at the time of the study. The total cost to develop and construct was $194.5 million and to date, some $1.7 million has been spent on operations (6 months). Refer to Table 2-1.

- Table 2-1: Oaklands Hill wind farm project cost by phase (cost to date)

| Item | Development | Construction | Operations | Total |
|---|---|---|---|---|
| Oaklands Hill wind farm cost to date | $7.0m | $187.5m | $1.7m | $196.2m |
| % total | 4% | 96% | 1% | 100% |

The gross value added was determined using input-output modelling and the results are outlined in Table 2-2. The 2011 value added estimate at $15.8 million represents a potential lift in the Gross Regional Product of 0.25%.

- Table 2-2: Oaklands Hill wind farm value added to date

| Item | Region | Victoria | Australia |
|---|---|---|---|
| **Pre-operations** | | | |
| Project value added to date | $27.7m | $106.3m | $144.6m |
| Per annum project value added to date | $15.8m | $60.7m | $82.6m |
| **Operations** | | | |
| Operations to date | $0.6m | $1.3m | $1.8m |

SKM modelling estimates that the total number of direct jobs resulting from pre-operation activities (i.e. development and construction) was some 95 jobs in the region, 153 jobs in Victoria and 177 jobs in Australia. Refer to Table 2-3. These are average annualised full time equivalent figures and represents employees who are directly employed at the wind farm as well as those directly employed in manufacturing plant and equipment supporting these activities. The total number of jobs (direct, indirect and induced) was some 156 jobs in the region, 517 jobs in Victoria and 599 jobs in Australia.

Due to some post-construction start-up, the operations cost to date at $1.7 million over the past 6 months is not indicative of future on-going operations and maintenance cost. The estimated on-going operations and maintenance cost is some $2.5 million per annum. SKM modelling estimates that the total number of jobs (direct, indirect and induced) from operations will be some 11 jobs in the region, 31 jobs in Victoria and 35 jobs in Australia.



- Table 2-3: Oaklands Hill wind farm employment impacts

| | Region | Victoria | Australia |
|---|---|---|---|
| **Pre-operations** | | | |
| Direct jobs | 95 | 153 | 177 |
| Indirect and induced | 61 | 364 | 423 |
| Total jobs (Direct, indirect and induced) | 156 | 517 | 599 |
| **On-going Operations** | | | |
| Direct jobs | 4 | 9 | 9 |
| Indirect and induced | 7 | 23 | 26 |
| Total jobs (Direct, indirect and induced) | 11 | 31 | 35 |

## 2.2. Macarthur wind farm

The construction of Macarthur wind farm commenced in November 2010 and to date it has been under construction for 22 months. Completion is expected in the first quarter of 2013.

Based on actual cost to date and estimated cost to complete, the total cost of Macarthur wind farm and supporting infrastructure is $984.0 million. This is made up of $848.5 million in cost to date (Refer to Table 2-4) and $135.5 million in cost to complete. Tarrone substation is complete as of September 2012 and the total cost came to $27.0 million.

- Table 2-4: Macarthur wind farm cost by phase (cost to date)

| Item | Development | Construction | Total |
|---|---|---|---|
| Macarthur wind farm (cost to date) | $29.1m | $819.4m | $848.5m |
| % total | 3% | 97% | 100% |

The gross value added was determined using input-output modelling and the results are outlined in Table 2-5. The 2011 value added estimate at $51.0 million represents a potential lift in the Gross Regional Product of 0.79%. The gross value added was based on the total cost to date, that is the sum of the Macarthur wind farm cost to date of $848.5 million and Tarrone substation total cost of $27.0 million.

- Table 2-5: Macarthur wind farm and Tarrone substation value added to date

| Item | Region | Victoria | Australia |
|---|---|---|---|
| **Pre-operations** | | | |
| Project value added to date | $119.0m | $458.0m | $600.1m |
| Per annum project value added to date | $51.0m | $196.3m | $257.2m |



SKM modelling estimates that the total number of direct jobs resulting from pre-operation activities (i.e. development, construction to date and construction to complete) for Macarthur wind farm and Tarrone substation is 478 jobs in the region, 595 jobs in Victoria and 644 jobs in Australia. Refer to Table 2-6. These are average annualised full time equivalent figures and represents employees who are directly employed at the wind farm as well as those directly employed in manufacturing plant and equipment supporting these activities. The total number of jobs (direct, indirect and induced) is 719 jobs in the region, 1,973 jobs in Victoria and 2,183 jobs in Australia.

The estimated operations and maintenance cost is some $16.7 million per annum. SKM modelling estimates that the total number of jobs (direct, indirect and induced) from operations will be some 41 jobs in the region, 103 jobs in Victoria and 115 jobs in Australia.

- Table 2-6: Macarthur wind farm and Tarrone substation employment impacts

| Project | Region | Victoria | Australia |
|---|---|---|---|
| **Total pre-operations** | | | |
| Direct jobs | 478 | 595 | 644 |
| Indirect and induced | 241 | 1379 | 1,539 |
| Total jobs (Direct, indirect and induced) | 719 | 1,973 | 2,183 |
| **On-going operations** | | | |
| Direct jobs | 17 | 28 | 30 |
| Indirect and induced | 24 | 75 | 85 |
| Total jobs (Direct, indirect and induced) | 41 | 103 | 115 |



# 3. Introduction

AGL engaged SKM to undertake an economic impact assessment of Oaklands Hill and Macarthur wind farm projects in the south west region of Victoria, some 300km west of Melbourne. The purpose of the study is to assess the impact the wind farms have on the regional economy and, to a lesser extent, on the State and Australian economies. The assessment is both quantitative and qualitative and demonstrates the benefits of AGL's wind energy investments in the region and beyond including:

- Impacts on the regional economy defined as the Local Government Areas (LGAs) of Southern Grampians Shire, Moyne Shire, Glenelg Shire and the Warrnambool City; and
- Economic impacts, including but not limited to Gross Regional Product (GRP), direct and indirect employment.

AGL has been actively investing in wind energy and wind technology for a number of years. AGL recently completed construction of the Oaklands Hill wind farm and is due to complete the Macarthur wind farm by early 2013.

Construction of the Oaklands Hill wind farm commenced in May 2010 and was completed in February 2012, taking 21 months to complete. It comprises 32 x 2.1MW turbines with an allowed output of 63MW, located in Southern Grampians Shire. The total cost to develop and construct was $194.5 million and to date, some $1.7 million has been spent on operations (6 months). Refer to Table 3-1 for a summary.

Construction of the Macarthur wind farm commenced in November 2010 with completion expected in early 2013. It comprises 140 x 3MW turbines with a total output of 420MW. Located in Moyne Shire, it will be the largest wind farm in Victoria when it is completed. The total expenditure is $848.5 million to date with another $135.5 million required to completion. Tarrone substation is complete as of September 2012 and the total cost came to $27.0 million.

Refer to Table 3-1 for summary.

- Table 3-1: Summary of Oaklands Hill and Macarthur wind farms

| | No. Of turbines | Capacity | Start of construction | End of construction | Construction period |
|---|---|---|---|---|---|
| Oaklands Hill wind farm | 32 turbines, 2.1MW each | 63MW | May 2010 | February 2012 | 21 months |
| Macarthur wind farm | 140 turbines, 3MW each | 420MW | November 2010 | Early 2013 (estimate) | 28 months (estimate) |



As a part of the study, SKM:

1) Visited Oaklands Hill and Macarthur wind farms during August 2012;
2) Developed a socio-economic profile of the region;
3) Collected and reconciled expenditure and employment data from key contractors;
4) Interviewed key business owners and key representatives from Southern Grampians Shire and Moyne Shire;
5) Conducted a staff expenditure survey at Macarthur wind farm;
6) Based on the expenditure and employment data collected, SKM estimated the economic impact on Gross Regional Product (GRP) and first and second order jobs generation; and
7) Based on the interviews, SKM developed a qualitative assessment of the wind farm projects on the region.



# 4. Methodology

This section provides a more detailed description of the steps three (3), four (4) and six (6) outlined in the Introduction.

## 4.1. The collection and reconciliation of expenditure and employment data

The primary input of the study is the total expenditure and the geographical areas over which it is spent. Expenditure data from key contractors were collected through a survey questionnaire (Refer to Appendix C and Appendix D). The expenditure data was reviewed and anomalies reconciled. Consideration was given to potential double counting and they were addressed. While it is possible that estimates may be under or over estimated, it is unlikely to be material. Refer to Table 4-1 for a list of the key contractors surveyed for expenditure and employment data.

- Table 4-1: List of key contractors surveyed for expenditure data

| Oaklands Hill wind farm | Macarthur wind farm |
|---|---|
| ▪ AGL<br>▪ Repower<br>▪ Sinclair Knight Merz (SKM)<br>▪ Garrad Hassan<br>▪ Abigroup<br>▪ AECOM[1]<br>▪ Powercor | ▪ AGL<br>▪ Meridian Energy<br>▪ Leighton Contractors and Vestas Consortium<br>▪ Sinclair Knight Merz (SKM)<br>▪ Garrad Hassan<br>▪ KBR<br>▪ SP Ausnet |

More specifically, the questionnaire requested the following information:

- Total expenditure by phase and indicative proportions by the location in which it was spent; south west region of Victoria, rest of Victoria, rest of Australia and overseas;
- More detailed regional expenditure by phase and items. These items included accommodation, meals and incidental spending, council and other regulatory fees and charges, community funds or sponsorships, landowner payments and others;

[1] AECOM data estimated by AGL



- Type of accommodation used by direct and contractor employees during construction. This information was only estimated for the construction phase of each wind farm when the largest numbers of employees are residents in the region. During development it is likely that while employees may visit a number of times, most visits would be relatively short term including day trips from Melbourne. Accommodation for overnight stays is likely to be motels, hotels, guest houses or bed and breakfast. The number of operational employees is even smaller and likely to be from the region. It is expected that permanent non-local full time staff will either purchase or rent a home on a longer term lease with some specialist staff visiting for specific operational and/or maintenance activities;
- Peak and average employment figures by phase; and
- Various company policies related to labour hire and employment including any specific programs for specific target groups and skills development.

The information obtained was analysed and reported in this report. **As some information was confidential, no individual company data has been reproduced in this report.**

Due to the confidentially issues, Leighton Contractors and Vestas Consortium, Powercor, SP Ausnet and Abigroup have not provided expenditure or employment data.

## 4.2. The interview and consultation process

During the site visit in August 2012, SKM conducted interviews with landowners, local business owners, local representatives of AGL and contractors and the Major Projects Liaison Officer from Moyne Shire. SKM supplemented the information with follow up phone calls as well as telephone interviews with other business owners and the business representative from Southern Grampians Shire.

## 4.3. Economic impact on GRP

An Input-Output (IO) table provides a snapshot of the transactions occurring within an economy over a selected period. The Australian Bureau of Statistics (ABS) produces IO tables at the national level. These tables show the consumption and sales patterns of 111 industries, specifically identifying for each industry, the other industries it purchases from and the other industries which it sells to. The national (Australian) IO tables also show the use of industry production in private and government consumption, public and private investment and sales of exports.

IO analysis is a well-established and widely used technique for estimating the economic impacts of an existing, expanding or new economic activity in a region. The framework examines how investment affects an economy through all linkages between all industries, supply, and demand in the economy. It takes the initial effect of the investment and develops direct, indirect, and induced multipliers, to estimate flow-on effects. The final result



is a picture of the expected contribution given current economic relationships for the regional, state and national economies[2,3].

Figure 4-1 illustrates the general IO analysis framework used to estimate the economic impact of the Oaklands Hill and Macarthur wind farm projects. The initial expenditure on the wind farm creates a first-round, or direct flow-on effect, across all businesses and employees in the supply chain supporting the wind farms (e.g. construction or mining). This in turn encourages further indirect expansionary effects on other sectors of the economy that support wind farms (e.g. residential building construction and electricity suppliers). As well as the direct and indirect effects, further induced impacts or 'consumption' effects are expected to be realised in terms of the consumption of goods and services by the household sector (e.g. retail trade, cafes and restaurants)[4,5]. The IO tables are used to generate multipliers, which capture the indirect and induced effects of a proposed development scenario by multiplying the direct spend of a project.

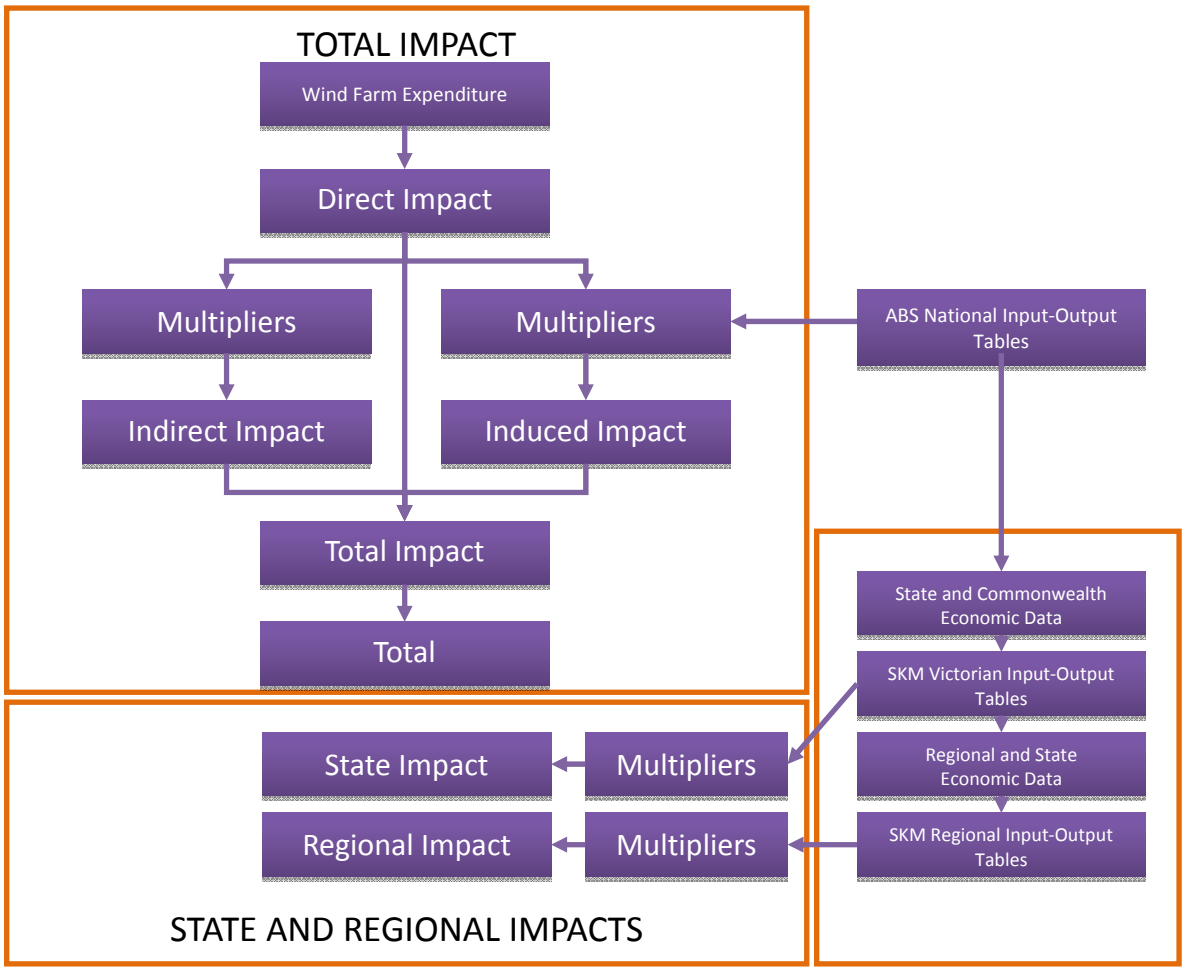
[2] Department of Economic and Social Affairs Statistics Division (1999), *Handbook of Input-Output Table Compilation and Analysis*, United Nations

[3] Eurostat (2008), Eurostat *Manual of Supply, Use and Input-Output Tables*, European Commission

[4] Department of Economic and Social Affairs Statistics Division (1999), *Handbook of Input-Output Table Compilation and Analysis*, United Nations

[5] Eurostat (2008), Eurostat *Manual of Supply, Use and Input-Output Tables*, European Commission

- Figure 4-1: Input-output framework[6]




While the ABS produces national IO tables, they do not produce state or regional tables. The tables produced by the ABS are also released several periods in arrears, the latest being 2008-2009.

To estimate the national, state and regional economic impacts, SKM developed updated 2010 and 2011 IO tables for Australia, Victoria and the region (i.e. the combined LGAs). SKM first updated the 2008-2009 ABS[7] IO tables using the 2010-2011 Australian National Accounts and May 2011 Labour Force Statistics, applying a biproportional update technique. Using a top-down approach, SKM modified the updated 2010-2011 national IO tables from the ABS, applying a modified Distributive Commodity Balance (DCB) method to disaggregate the tables from the ABS into their state and then regional components. In this way, a current and updated picture of economic linkages within Victoria and the Region was estimated.

[6] Produced by SKM

[7] Australian Bureau of Statistics (2011), *Australian National Accounts: Input-Output Tables – Electronic Publication, 2007-2008 Final*, 5209.0.55.001, Australian Government.



The DCB approach tries to balance supply and demand, by using employment and value added based location quotients to distribute economic activity across industrial sectors and form an IO framework for Victoria. This same approach was again used to disaggregate the updated Victorian tables to regional tables for the study region. Further detail on the use of the modified DCB approach is contained in Appendix F.

In addition to developing disaggregated tables to assess the regional and state impacts, the total project expenditure in the respective regions, Victoria and Australia was estimated for each project. This breakdown was based on the estimated breakdown from the Oaklands project and industry estimates based on this and other recent wind farm projects for Macarthur[8]. Where there was potential for variation in these estimates the conservative estimate was used.

### Impact definitions

The economic impact of the Oaklands Hill and Macarthur wind farms can be traced through the economic system in several different ways. For the purpose of this assessment, the following types of impacts are used:

- The direct multiplier effect represents the increase in economic activity (value added and output) and employment which is directly generated across all supplying sectors in the industry receiving the initial impact;
- The indirect multiplier effect represents the second round that occurs across all secondary industries in the economy to support the direct impact;
- The induced multiplier effect represents the change in consumption by the household sector or consumption effect in response to income changes resulting from the direct and indirect impacts; and
- The total multiplier effect is the sum of the direct, indirect and induced multiplier effects outlined above.

## Economic indicators

IO tables provide a snapshot of the economy in a given region, allowing for a detailed analysis of a regional economy to be performed and are used to generate IO multipliers, which are used to conduct economic impact analysis.

IO multipliers can be used to estimate the direct, indirect and induced effects of an economic stimulus on a region. For example, if demand for transport services from Victoria were to increase, IO multipliers can be used to estimate the total impact of this increased demand on income, value-added and employment in Victoria.

Value-added (at market prices) represents the sum of wages, profits and indirect taxes, and is the standard measure used in Australia to represent the size of an economy. Value added represents the increase in Gross Regional Product (GRP) at the regional level, the

[8] Due to confidentiality reasons specific estimates were not provided for Macarthur.



increase in Gross State Product (GSP) at the State level; and the increase in Gross Domestic Product (GDP) at the national level.

The total economic impact identified by use of IO multipliers includes the direct effect of the initial increase in demand and the indirect (or "flow-on") effects. The flow-on effects result from the linkages between industries in the economy. For example, transport service providers in Victoria purchase inputs from other local industries. When demand for their output increases, the transport companies will increase their purchases from other local businesses, who themselves must increase their consumption, some of which will be from other local firms, and so on.

## Limitations

The IO analysis technique is based on certain restrictive assumptions, including:

- Constant prices;
- Fixed technology;
- Fixed import shares;
- Unlimited supplies of all resources, including labour and capital; and
- A fixed relationship between income and private consumption.

As a result of these assumptions, there is no substitution between goods and services or between capital and labour in the production process and no substitution between goods and services in consumption. Additionally, there are no limitations on the supply of labour or capital to industry, meaning that there are no supply-side limits on growth.

Induced multipliers, as described above, include consumption induced effects. These consumption induced effects assume that all of the labour used in the Oaklands Hill and Macarthur wind farms and all of the labour employed as a result of the flow-on effects was previously unemployed, or did not exist in the project area. It is also assumed that this newly employed labour spends all of its income. As a result impacts can potentially be overstated, especially when a remote workforce or a remote location is involved. In this sense, the total impact can be considered a maximum potential impact, depending on the degree of induced effects, or labour consumption that is captured by the study area.

# 5. Description of the region

This chapter describes the main demographic and socio-economic attributes of the region and then indicates the scale of the Oaklands Hill and Macarthur wind farms in this regional context. The primary data source is the ABS 2001 and 2006 census since the 2011 census release is incomplete. Appendix B provides additional demographic and socio-economic data.

## 5.1. Socio-economic profile for the region

The Oaklands Hill and Macarthur wind farms are located approximately 300km west of Melbourne in the LGAs of Southern Grampians and Moyne Shires respectively.

- Figure 5-1: Region (subject area)


### Population

As of the 2006 census, the population of Moyne and Southern Grampians Shire were 15,452 and 16,639 persons respectively. The populations of the Glenelg Shire and Warrnambool City as of the 2006 census were 19,759 and 30,391 respectively. These form a combined estimate of 82,241, approximately 6.2% of the population of the balance of Victoria.

Table 5-1 demonstrates that both Southern Grampians and Moyne Shires have experienced a growth of 0.2% and 1.0% respectively. Results suggest that few people are leaving or arriving into these areas. Glenelg Shire Council has experienced a reasonable growth of 2.6% and Warrnambool City Council has experienced a significant growth of 6.4%.

Figure 5-2 shows a trend towards an aging population. From 2001 to 2006, the proportion of people under the age of 44 has fallen and the proportion of people over the age of 45 has increased. As a result, the median ages have increased in all areas; Southern Grampians from 40 years old to 42 years old, Moyne from 38 years old to 40 years old, Glenelg from 37 to 41 years old, and Warrnambool from 34 to 36 years old. The median ages for the balance of Victoria have also increased, from 37 years old in 2001 census to 39 years old in 2006 census.

While it is difficult to predict population growth into the future, the Australian Bureau of Statistics (ABS) has released three main projections to the year 2056 for the balance of Victoria. The first projection was largely based on year 2006 trends in fertility, life expectancy at birth, net overseas migration and net interstate migration. The remaining two projections were based on high and low assumptions for each of these variables.

Based on 2006 trends, Figure 5-3 shows that the population for the balance of Victoria is projected to increase by 17% to 2026. The growth for the region from 2006 to 2020 are; 9%[9,10] for Southern Grampians and Moyne Shires and 23%[11] for the City of Warrnambool. Population forecast for Glenelg Shire were not available.

- Table 5-1: Population size as of 2006 and 2001 census[12,13]

| Region | 2001 Census | 2006 Census | % change |
|---|---|---|---|
| Southern Grampians | 16,606 | 16,639 | 0.2% |
| Moyne | 15,304 | 15,452 | 1.0% |
| Glenelg | 19,250 | 19,759 | 2.6% |
| Warrnambool | 28,573 | 30,391 | 6.4% |
| Bal. of Victoria | 1,273,393 | 1,333,437 | 4.7% |

[9] Southern Grampians Shire, viewed 3 September 2012 <http://forecast.id.com.au/Default.aspx?id=280&gid=10&pg=30011>

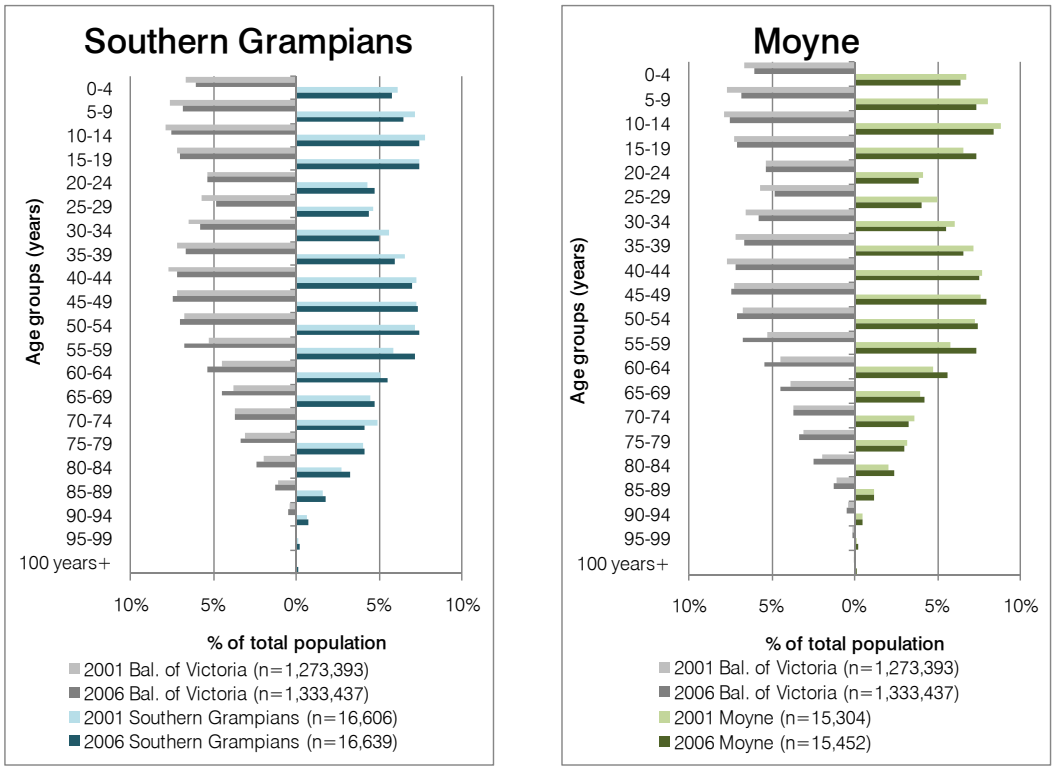
[10] Moyne Shire, viewed 3 September 2012 <http://forecast.id.com.au/Default.aspx?id=279&pg=30011&gid=10>

[11] Warrnambool City, viewed 3 September 2012 <http://forecast2.id.com.au/default.aspx?id=281&pg=5000>

[12] Australian Bureau of Statistics, (2003), *Cat. No.2004 Community Profile Series based on place of usual residence.*

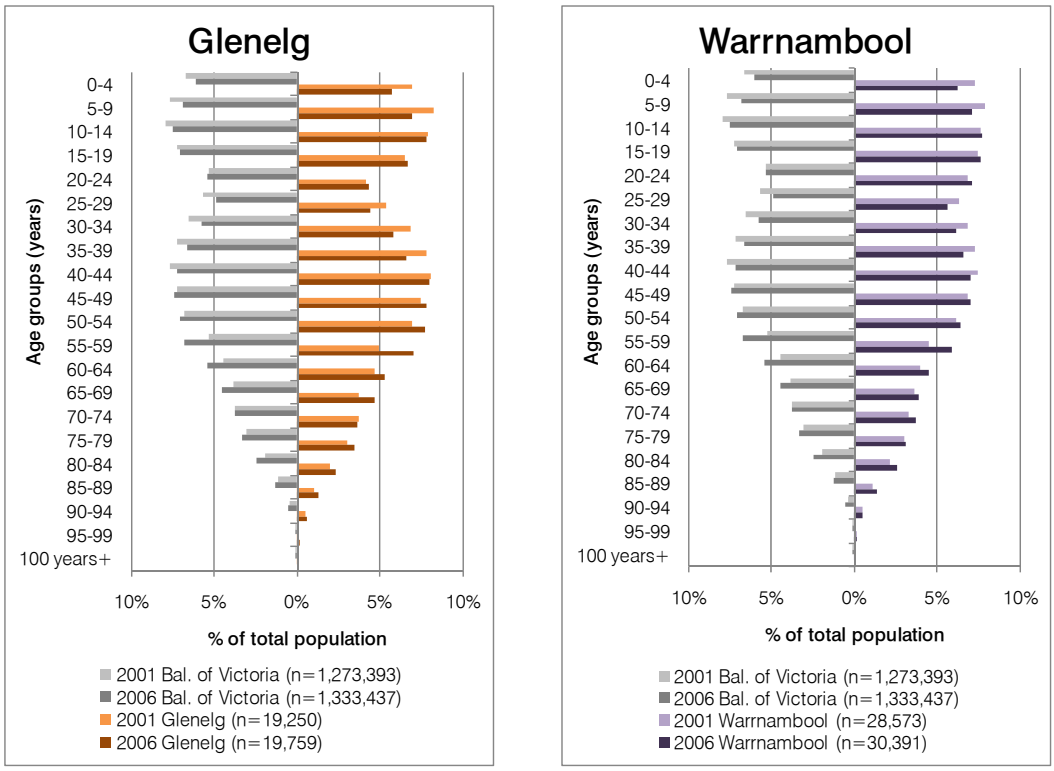
[13] Australian Bureau of Statistics, (2007), *Cat. No.2001 Basic Community Profile based on place of usual residence.*

- Figure 5-2 Age distribution for region[14,15]

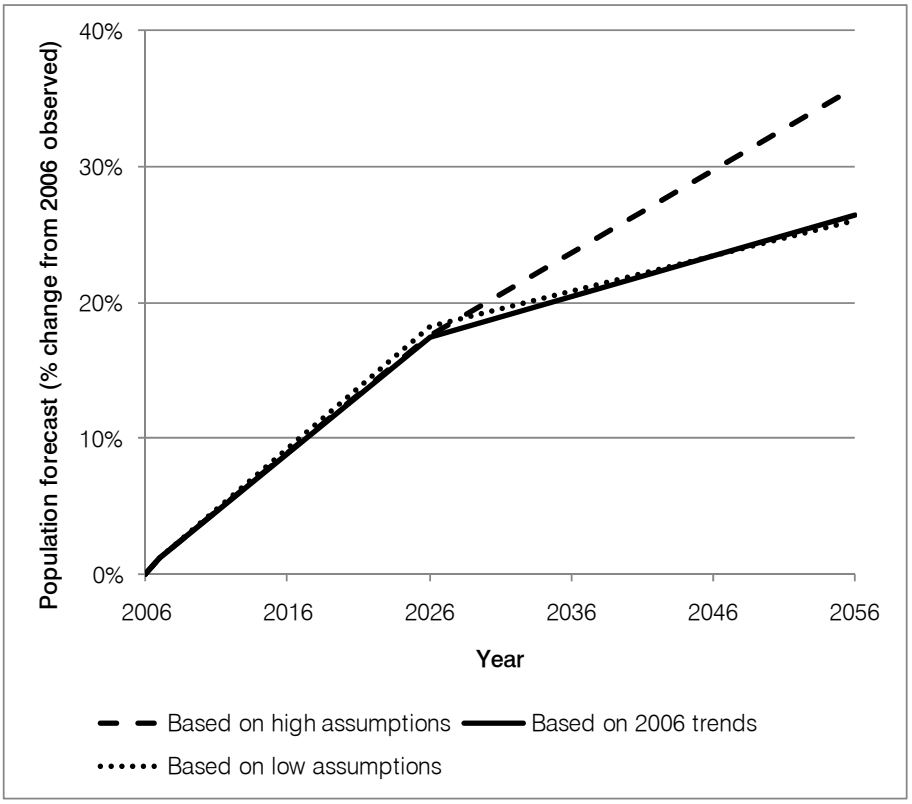



[14] Australian Bureau of Statistics, (2003), *Cat. No.2004 Community Profile Series based on place of usual residence.*

[15] Australian Bureau of Statistics, (2007), *Cat. No.2001 Basic Community Profile based on place of usual residence.*




- Figure 5-3 Population projection (percentage change) for the balance of Victoria[16]




[16] Australian Bureau of Statistics, viewed 3 September 2012, <http://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/3222.0>.



## Labour force

The five year trend from the 2001 census to 2006 census shows that more residents have become employed and fewer have become unemployed in all four LGAs; the number of employed residents changed from 7,187 in 2001 census to 7,830 in 2006 census (Southern Grampians Shire), from 7,067 in 2001 census to 7,384 in 2006 census (Moyne Shire), from 8,296 to 8,897 in Glenelg Shire, and from 12,306 to 13,925 in Warrnambool City. Refer to Table 5-2.

However the five year trend from 2006 census to 2011 Small Area Labour Markets (SALM) report shows a slightly less optimistic outlook; the number of unemployed residents changed:

- From 330 in 2006 census to 470 in 2011 SALM report in Southern Grampians Shire;
- From 250 in 2006 census to 314 in 2011 SALM report in Moyne Shire;
- From 600 in 2006 census to 775 in 2011 SALM report in Glenelg Shire; and
- From 764 in 2006 census to 981 in 2011 SALM report in Warrnambool City.

However since the labour force has also changed, the underlying unemployment rate has remained more or less steady. Refer to Table 5-3.

A closer look at the recent data shows that the unemployment rate for Southern Grampians Shire, Moyne Shire and Warrnambool City is less than the unemployment rate for the balance of Victoria and since March 2011, there has been a downward trend in line with the improving economy. However the unemployment rate for Glenelg Shire is greater than the unemployment rate for the Balance of Victoria. Refer to Table 5-4.



- Table 5-2: Employment status as of the 2006 census and percentage change from 2001 census[17,18]

| Region | Employed | | Unemployed | | | | Total labour force | | Unemployment rate | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Looking for full-time work | | Looking for part-time work | | | | | |
| | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | Pt chg from 2001 |
| Southern Grampians | 7,830 | 9% | 216 | -15% | 114 | -14% | 8,160 | 8% | 4.0% | -1.1% |
| Moyne | 7,384 | 4% | 161 | -33% | 89 | -8% | 7,634 | 3% | 3.3% | -1.3% |
| Glenelg | 8,897 | 7% | 404 | -22% | 196 | -3% | 9,497 | 5% | 6.3% | -1.6% |
| Warrnambool | 13,925 | 13% | 456 | -25% | 308 | 2% | 14,689 | 11% | 5.2% | -21% |
| Bal. of Victoria | 585,996 | 9% | 22,632 | -28% | 12,153 | 4% | 620,781 | 7% | 5.6% | -1.8% |

- Table 5-3: Employment status as of 2011 small area labour markets and percentage change from 2006 census[19,20]

| Region | Employed | | Unemployed | | Total labour force | | Unemployment rate | |
|---|---|---|---|---|---|---|---|---|
| | Avg 2011 | % chg from 2006 | Avg 2011 | % chg from 2006 | Avg 2011 | % chg from 2006 | Avg 2011 | Pt chg from 2006 |
| Southern Grampians | 9,616 | 23% | 470 | 43% | 10,086 | 24% | 4.7% | +0.7% |
| Moyne | 9,125 | 24% | 314 | 26% | 9,439 | 24% | 3.3% | +0% |
| Glenelg | 10,967 | 23% | 775 | 29% | 11,742 | 24% | 6.6% | +0.3% |
| Warrnambool | 17,176 | 23% | 981 | 28% | 18,157 | 24% | 5.4% | +0.2% |
| Bal. of Victoria | 730,650 | 25% | 43,650 | 25% | 774,300 | 25% | 5.6% | +0% |

[17] Australian Bureau of Statistics, (2003), *Cat. No. 2004 Community Profile Series based on place of usual residence.*

[18] Australian Bureau of Statistics, (2007), *Cat. No. 2001 Community Profile Series based on place of usual residence.*

[19] Australian Bureau of Statistics, (2003), *Cat. No. 2004 Community Profile Series based on place of usual residence.*

[20] Department of Education, Employment and Workplace Relations, viewed 3 September 2012 < http://www.deewr.gov.au/Employment/LMI/Pages/SALM.aspx>



- Table 5-4: Unemployment rate (March 2011 to March 2012) [21]

| Region | Mar-11 | Jun-11 | Sep-11 | Dec-11 | Mar-12 |
|---|---|---|---|---|---|
| Southern Grampians | 5.0% | 4.8% | 4.5% | 4.4% | 4.4% |
| Moyne | 3.6% | 3.5% | 3.2% | 3.1% | 3.1% |
| Glenelg | 7.1% | 6.9% | 6.3% | 6.1% | 6.0% |
| Warrnambool | 5.7% | 5.6% | 5.3% | 5.0% | 5.1% |
| Bal. of Victoria | 6.0% | 5.8% | 5.5% | 5.2% | 5.3% |

## Industries of employment

The major industries of employment within Southern Grampians, Moyne and Glenelg Shires are very similar with agriculture, forestry and fishing being dominant. However it appears to be on the decline; it decreased from 25% in 2001 census to 21% in 2006 census (Southern Grampians Shire), from 37% in 2001 census to 32% in 2006 census (Moyne Shire), and from 18% in 2001 census to 15% in 2006 census (Glenelg Shire). In Warrnambool, agriculture, forestry and fishing represented a much smaller portion of employment: 3% in the 2001 census and 2% in the 2006 census.

Other major industries for both Southern Grampians and Moyne Shires are health care and social assistance, retail trade and construction. These industries plus agriculture represents 52% and 57% of all employment for Southern Grampians Shire and Moyne Shire respectively (as of 2006 census).

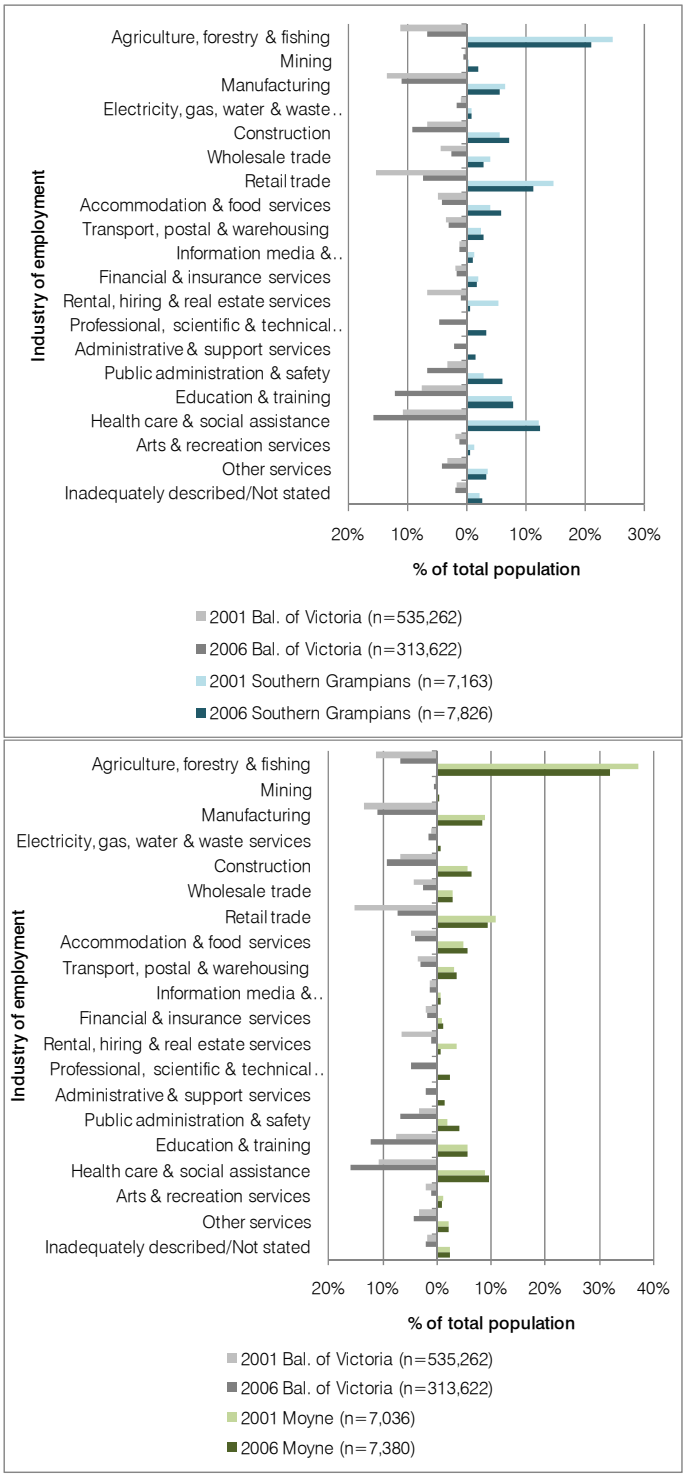
For Glenelg Shire manufacturing, retail trade, construction, and health care combine with agriculture to represent 61% of employment. Agriculture is less strongly represented in Warrnambool, where manufacturing, construction, retail, education and training, and health care industries combine to represent 57% of employment.

While the proportions of these major industries are on the decline, there has been an increase in other areas. In Southern Grampians and Moyne Shires, the professional, scientific and technical services, administrative and support services and mining sectors have increased notably since the 2001 census, in part reflecting the development of the mineral sands sector in the region.

While the proportions and trends are similar to the balance of Victoria, it is noted that for Southern Grampians and Moyne Shires, agriculture, forestry and fishing industry forms a far greater proportion of employment than the rest of the State.

[21] Department of Education, Employment and Workplace Relations, viewed 3 September 2012 < http://www.deewr.gov.au/Employment/LMI/Pages/SALM.aspx>

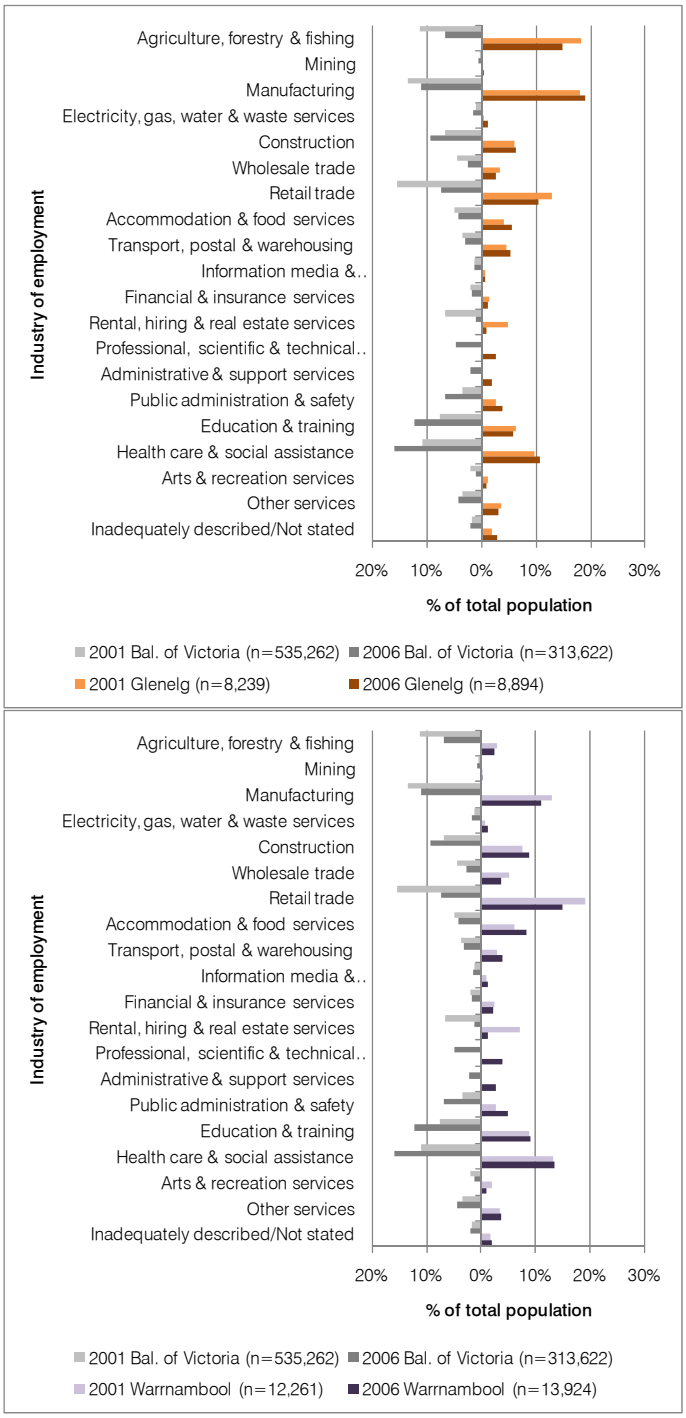
- Figure 5-4 Industry of employment for Southern Grampians Shire (top) and Moyne Shire (bottom) [22,23]




[22] Australian Bureau of Statistics, (2003), *Cat. No. 2004 Community Profile Series based on place of usual residence.*

[23] Australian Bureau of Statistics, (2007), *Cat. No. 2001 Community Profile Series based on place of usual residence.*

- Figure 5-5 Industry of employment for Glenelg Shire (top) and City of Warrnambool (bottom) [24,25]




[24] Australian Bureau of Statistics, (2003), *Cat. No. 2004 Community Profile Series based on place of usual residence.*

[25] Australian Bureau of Statistics, (2007), *Cat. No. 2001 Community Profile Series based on place of usual residence.*



Table 5-5 to Table 5-8 shows the number of businesses by industry and employment size. The majority of businesses are small with 73% for Southern Grampians Shire, 85% for Moyne Shire, 88% for Glenelg Shire and 79% for Warrnambool City employing four or less people.

- Table 5-5: Count of businesses by industry and employment size (Southern Grampians Shire 2011)[26]

| Industry | Non empl | 1-4 | 5-19 | 20-199 | 200+ | Total | % total |
|---|---|---|---|---|---|---|---|
| Agriculture, Forestry and Fishing | 363 | 217 | 194 | 29 | 3 | 806 | 71% |
| Mining | | | | | | 0 | 0% |
| Manufacturing | 6 | | 3 | 3 | | 12 | 1% |
| Electricity, Gas, Water and Waste Services | | | | | | 0 | 0% |
| Construction | 32 | 17 | 12 | | | 61 | 5% |
| Wholesale Trade | 12 | 3 | 3 | | | 18 | 2% |
| Retail Trade | 13 | 8 | 3 | 3 | | 27 | 2% |
| Accommodation and Food Services | 6 | 6 | 10 | 3 | | 25 | 2% |
| Transport, Postal and Warehousing | 18 | 15 | 6 | | | 39 | 3% |
| Information Media and Telecommunications | | | | | | 0 | 0% |
| Financial and Insurance Services | 9 | 9 | | | | 18 | 2% |
| Rental, Hiring and Real Estate Services | 33 | 3 | 6 | | | 42 | 4% |
| Professional, Scientific and Technical Services | 14 | 3 | 6 | 3 | | 26 | 2% |
| Administrative and Support Services | 11 | 3 | 6 | | | 20 | 2% |
| Public Administration and Safety | | | | | | 0 | 0% |
| Education and Training | 3 | | | | | 3 | 0% |
| Health Care and Social Assistance | 3 | | 6 | | | 9 | 1% |
| Arts and Recreation Services | 3 | | | | | 3 | 0% |
| Other Services | 6 | 6 | 3 | | | 15 | 1% |
| Not Classified 1 | 6 | | | | | 6 | 1% |
| Total | 538 | 290 | 258 | 41 | 3 | 1,130 | 100% |

[26] Australian Bureau of Statistics, (2012) Cat No. 8165.0 *Counts of Australian Businesses, including Entries and Exists, Jun 2007 to Jun 2011*



- Table 5-6: Count of businesses by industry and employment size (Moyne Shire 2011)[27]

| Industry | Non empl | 1-4 | 5-19 | 20-199 | 200+ | Total | % total |
|---|---|---|---|---|---|---|---|
| Agriculture, Forestry and Fishing | 784 | 315 | 139 | 20 | 3 | 1,261 | 57% |
| Mining | 9 | | | | | 9 | 0% |
| Manufacturing | 32 | 12 | 9 | | | 53 | 2% |
| Electricity, Gas, Water and Waste Services | 6 | | | | | 6 | 0% |
| Construction | 133 | 63 | 20 | 9 | | 225 | 10% |
| Wholesale Trade | 18 | 12 | 3 | | 3 | 36 | 2% |
| Retail Trade | 39 | 34 | 18 | 6 | | 97 | 4% |
| Accommodation and Food Services | 17 | 17 | 26 | 9 | | 69 | 3% |
| Transport, Postal and Warehousing | 47 | 16 | 10 | 3 | | 76 | 3% |
| Information Media and Telecommunications | 4 | 3 | | | | 7 | 0% |
| Financial and Insurance Services | 40 | 9 | 3 | | | 52 | 2% |
| Rental, Hiring and Real Estate Services | 116 | 3 | 3 | | | 122 | 6% |
| Professional, Scientific and Technical Services | 35 | 10 | 6 | | | 51 | 2% |
| Administrative and Support Services | 9 | 3 | | 3 | | 15 | 1% |
| Public Administration and Safety | 3 | | 3 | | | 6 | 0% |
| Education and Training | 11 | 3 | 6 | | | 20 | 1% |
| Health Care and Social Assistance | 13 | | 6 | 3 | | 22 | 1% |
| Arts and Recreation Services | 11 | 6 | 6 | | | 23 | 1% |
| Other Services | 24 | 12 | 3 | | | 39 | 2% |
| Not Classified 1 | 21 | 3 | 3 | | | 27 | 1% |
| Total | 1,372 | 521 | 264 | 53 | 6 | 2,216 | 100% |

- Table 5-7: Count of businesses by industry and employment size (Glenelg Shire 2011)[28]

| Industry | Non empl | 1-4 | 5-19 | 20-199 | 200+ | Total | % total |
|---|---|---|---|---|---|---|---|
| Agriculture, Forestry and Fishing | 529 | 162 | 74 | 21 | | 786 | 62% |
| Mining | | | | | | | 0% |
| Manufacturing | 10 | 3 | 5 | | | 18 | 1% |
| Electricity, Gas, Water and Waste Services | 6 | | | | | 6 | 0% |
| Construction | 63 | 39 | 7 | | | 109 | 9% |
| Wholesale Trade | 9 | 6 | 6 | | | 21 | 2% |
| Retail Trade | 27 | 10 | 7 | | | 44 | 3% |
| Accommodation and Food Services | 7 | 9 | 11 | | | 27 | 2% |
| Transport, Postal and Warehousing | 32 | 19 | 6 | | | 57 | 5% |
| Information Media and Telecommunications | | | | | | | 0% |
| Financial and Insurance Services | 25 | 3 | | | | 28 | 2% |
| Rental, Hiring and Real Estate Services | 56 | 6 | | | | 62 | 5% |
| Professional, Scientific and Technical Services | 23 | 10 | 3 | | | 36 | 3% |
| Administrative and Support Services | 10 | | | 3 | | 13 | 1% |
| Public Administration and Safety | | | | 3 | | 3 | 0% |
| Education and Training | 3 | | | | | 3 | 0% |
| Health Care and Social Assistance | 12 | | | | | 12 | 1% |
| Arts and Recreation Services | 6 | | | | | 6 | 0% |
| Other Services | 16 | 3 | 3 | | | 22 | 2% |
| Not Classified 1 | 12 | | | | | 12 | 1% |
| Total | 846 | 270 | 122 | 27 | 0 | 1,265 | 100% |

[27] Australian Bureau of Statistics, (2012) Cat No. 8165.0 *Counts of Australian Businesses, including Entries and Exists, Jun 2007 to Jun 2011*

[28] Australian Bureau of Statistics, (2012) Cat No. 8165.0 *Counts of Australian Businesses, including Entries and Exists, Jun 2007 to Jun 2011*



- Table 5-8: Count of businesses by industry and employment size (City of Warrnambool 2011)[29]

| Industry | Non empl | 1-4 | 5-19 | 20-199 | 200+ | Total | % total |
|---|---|---|---|---|---|---|---|
| Agriculture, Forestry and Fishing | 218 | 71 | 27 | 6 | | 322 | 11% |
| Mining | 3 | | | | | 3 | 0% |
| Manufacturing | 62 | 24 | 28 | 14 | | 128 | 4% |
| Electricity, Gas, Water and Waste Services | | 3 | | | | 3 | 0% |
| Construction | 290 | 156 | 64 | 11 | | 521 | 18% |
| Wholesale Trade | 38 | 6 | 19 | 13 | | 76 | 3% |
| Retail Trade | 74 | 57 | 91 | 19 | 3 | 244 | 8% |
| Accommodation and Food Services | 35 | 44 | 55 | 31 | 3 | 168 | 6% |
| Transport, Postal and Warehousing | 82 | 23 | 21 | 10 | | 136 | 5% |
| Information Media and Telecommunications | 6 | | | | | 6 | 0% |
| Financial and Insurance Services | 171 | 25 | 14 | | | 210 | 7% |
| Rental, Hiring and Real Estate Services | 253 | 6 | 16 | 3 | | 278 | 10% |
| Professional, Scientific and Technical Services | 90 | 42 | 31 | 9 | | 172 | 6% |
| Administrative and Support Services | 36 | 10 | 20 | 12 | | 78 | 3% |
| Public Administration and Safety | 3 | | 3 | 3 | | 9 | 0% |
| Education and Training | 15 | 9 | | 12 | | 36 | 1% |
| Health Care and Social Assistance | 63 | 63 | 29 | 6 | 3 | 164 | 6% |
| Arts and Recreation Services | 22 | 9 | 6 | 3 | | 40 | 1% |
| Other Services | 56 | 29 | 33 | 3 | | 121 | 4% |
| Not Classified 1 | 187 | 6 | | | | 193 | 7% |
| Total | 1,704 | 583 | 457 | 155 | 9 | 2,908 | 100% |

Based on the above data, the predominance of small businesses in the area may limit the participation of local businesses in some aspects of major regional projects. However, there are some transport, manufacturing and construction companies of a reasonable size in all Shires that could have a relevant mix of skills and equipment. In addition, both Shires have a high proportion of agricultural businesses that are likely to employ multi-skilled people and a range of heavy equipment that may allow them to participate in the process.

As shown later, local businesses with the relevant skills and equipment have been contracted as part of the project development.

## Agriculture

Table 5-9 shows the total land and agricultural land area for all shires. Results show that Southern Grampians Shire is the largest at 6,652 square metres. Consistent with the industries of employment data above, agricultural land for both Southern Grampians and Moyne Shires represent a large proportion of their total area at 70% and 84% respectively.

[29] Australian Bureau of Statistics, (2012) Cat No. 8165.0 *Counts of Australian Businesses, including Entries and Exists, Jun 2007 to Jun 2011*



- Table 5-9: Total land and agricultural land area (2006 estimate) [30]

| Region | Total land area (km$^2$) | Agricultural land area (km2) | % of agricultural land to total land |
|---|---|---|---|
| Southern Grampians | 6,652 | 4,665 | 70% |
| Moyne | 5,478 | 4,593 | 84% |
| Glenelg | 6,210 | 2,940 | 47% |
| Warrnambool | 121 | 80 | 66% |

## Income

Many of the occupation categories have changed since the 2001 census therefore the results from 2001 have not been reproduced here. Some key observations from Table 5-10 and Table 5-11 are:

- Table 5-10 shows that the median income for the region is higher than for the balance of Victoria;
- The trend in median income (by occupation) is similar across all areas and the balance of Victoria. Professionals have the highest or equal highest median income range at $800-$999 per week and employees in sales tend to be the lowest paid;
- Table 5-11 shows that the median income range for the mining industry is high across all areas and the balance of Victoria; Southern Grampians Shire at $1,300-$1,599 per week, Moyne Shire at $800-$999 per week, Glenelg Shire at $1,000-$1,299 per week, Warrnambool City at $1,600-$1,999 per week and the balance of Victoria at $1,000-$1,299 per week; and
- Employees in the accommodation and food services industry tend to be the lowest paid.

- Table 5-10: Median weekly income range by occupation (2006 census) [31]

| Occupation | Southern Grampians | Moyne | Glenelg | Warrnambool | Bal. of Victoria |
|---|---|---|---|---|---|
| All occupations (individual) | $417 | $432 | $405 | $422 | $399 |
| Managers | $600-$799 | $600-$799 | $600-$799 | $800-$999 | $600-$799 |
| Professionals | $800-$999 | $800-$999 | $800-$999 | $800-$999 | $800-$999 |
| Technicians and Trades Workers | $600-$799 | $600-$799 | $600-$799 | $600-$799 | $600-$799 |
| Community and Personal Service Workers | $400-$599 | $400-$599 | $400-$599 | $400-$599 | $400-$599 |
| Clerical and Administrative Workers | $400-$599 | $400-$599 | $400-$599 | $400-$599 | $600-$799 |
| Sales Workers | $400-$599 | $250-$399 | $250-$399 | $250-$399 | $250-$399 |

[30] Australian Bureau of Statistics, (2011), *National Regional Profile.*

[31] Australian Bureau of Statistics, (2007), Individual Income and Local Government Area by Occupation

| Occupation | Southern Grampians | Moyne | Glenelg | Warrnambool | Bal. of Victoria |
|---|---|---|---|---|---|
| Machinery Operators And Drivers | $600-$799 | $600-$799 | $800-$999 | $600-$799 | $600-$799 |
| Labourers | $400-$599 | $400-$599 | $400-$599 | $400-$599 | $400-$599 |

- Table 5-11: Median weekly income range by industry (2006 census) [32]

| Industry | Southern Grampians | Moyne | Glenelg | Warrnambool | Balance of Victoria |
|---|---|---|---|---|---|
| Agriculture, Forestry and Fishing | $600-$799 | $600-$799 | $600-$799 | $600-$799 | $400-$599 |
| Mining | $1,300-$1,599 | $800-$999 | $1,000-$1,299 | $1,600-$1,999 | $1,000-$1,299 |
| Manufacturing | $600-$799 | $600-$799 | $1,000-$1,299 | $600-$799 | $600-$799 |
| Electricity, Gas, Water and Waste Services | $600-$799 | $800-$999 | $800-$999 | $800-$999 | $1,000-$1,299 |
| Construction | $600-$799 | $600-$799 | $600-$799 | $600-$799 | $600-$799 |
| Wholesale Trade | $600-$799 | $600-$799 | $600-$799 | $600-$799 | $600-$799 |
| Retail Trade | $400-$599 | $400-$599 | $400-$599 | $400-$599 | $400-$599 |
| Accommodation and Food Services | $250-$399 | $250-$399 | $250-$399 | $250-$399 | $250-$399 |
| Transport, Postal and Warehousing | $600-$799 | $600-$799 | $600-$799 | $600-$799 | $600-$799 |
| Information Media and Telecommunications | $600-$799 | $400-$599 | $600-$799 | $600-$799 | $600-$799 |
| Financial and Insurance Services | $600-$799 | $600-$799 | $600-$799 | $800-$999 | $600-$799 |
| Rental, Hiring and Real Estate Services | $800-$999 | $600-$799 | $600-$799 | $600-$799 | $600-$799 |
| Professional, Scientific and Technical Services | $600-$799 | $600-$799 | $600-$799 | $600-$799 | $600-$799 |
| Administrative and Support Services | $400-$599 | $400-$599 | $400-$599 | $400-$599 | $400-$599 |
| Public Administration and Safety | $600-$799 | $600-$799 | $800-$999 | $600-$799 | $800-$999 |
| Education and Training | $800-$999 | $800-$999 | $800-$999 | $800-$999 | $800-$999 |
| Health Care and Social Assistance | $600-$799 | $400-$599 | $400-$599 | $600-$799 | $600-$799 |
| Arts and Recreation Services | $400-$599 | $250-$399 | $400-$599 | $400-$599 | $400-$599 |
| Other Services | $400-$599 | $400-$599 | $400-$599 | $400-$599 | $400-$599 |

[32] Australian Bureau of Statistics, (2007), Individual Income and Local Government Area by Occupation

### Gross Regional Product

Table 5-12 provides an estimate of the GRP for the region. The estimate is calculated from the Input-Output Model created by SKM. Further detail on the methodology used to create this estimate is contained in Appendix F. In year 2010/11, the latest available GSP for Victoria was $317,152 million.

- Table 5-12: Estimated gross regional product

| Item | Region | Victoria |
|---|---|---|
| GRP | $6,445m | $317,152m |
| % GSP | 2.03% | 100.00% |

## 5.2. Summary

The regional population is growing more slowly than the balance of Victoria. As service provision is to some extent a function of population, there is a danger that reductions in population can eventually lead to reduction in the services provided by local government due to a reduced rate base, state and federal government due to reduced population and the private sector. This may lead to a downward spiral in regional economic activity.

Major projects such as the Oaklands Hill and Macarthur wind farms help retain population by providing medium and long term employment and income opportunities for existing residents and businesses. It also provides an incentive for residents and former residents working away from the region to return and bring new people into the region both temporarily during construction and permanently in operating the facilities. Some of the employees who come into the region during construction may decide to stay on or make the region their home base while working on construction projects elsewhere.

Industry analysis suggests that, while regional businesses are small, there are a number of businesses in the industry sectors that can benefit from the wind farm developments, as have happened in practice.

Similarly the occupation and skills data suggests that the region is able to provide the more generic trades and employment skills needed by the wind farms. Again this seems to have been borne out in practice.

The latest unemployment data suggest that unemployment rates are relatively low and that therefore there may be reduced opportunities for local employment. However, this is often the case in regional areas where there may be under employment and hidden unemployment and where residents leave the region to work elsewhere and may or may not return if the economy recovers or may return to work on specific new projects. The Oaklands Hill and Macarthur wind farm projects have sought to employ locals with some success and to provide skills training and apprenticeships.



# 6. Economic impact of Oaklands Hill wind farm

This chapter provides a discussion around the project cost of Oaklands Hill wind farm and considers the economic impact of the wind farm on the following; direct expenditure in the region, employment and Gross Regional Product (GRP). This chapter also provides a qualitative assessment of the wind farm based on interviews with local business owners and Council representatives during August and September 2012.

The construction of Oaklands Hill wind farm took 21 months, from May 2010 to February 2012 when practical completion certificate was issued. When data was collected for the study, the wind farm had been in operations for 6 months, therefore all actual data associated with operations and maintenance is related to the period from February to August 2012.

## 6.1. Assessment of the project cost and impact on GRP

The project cost by phase (cost to date) is shown in Table 6-1 below. The development and construction cost is $194.5 million with some $1.7 million spent on operations and maintenance of the wind farm to date.

- Table 6-1: Oaklands Hill wind farm project cost by phase (cost to date)[33]

| Item | Development | Construction | Operations | Total |
|---|---|---|---|---|
| Oaklands Hill wind farm cost to date | $7.0m | $187.5m | $1.7m | $196.2m |
| % total | 4% | 96% | 1% | 100% |

The pre-operations total cost in Table 6-2 represents the combined development and construction costs in Table 6-1 above. It includes the planning and construction cost of the substation. The estimated annual operating cost is based on operations cost to date minus the operations cost related to post-construction start-up and then adjusted for the full 12 months.

Based on these actual and estimated costs, the total project cost is $194.5 million with some $2.5 million per annum in operating costs. A substantial amount of the operating costs will be spent in the region.

- Table 6-2: Oaklands Hill wind farm pre-operations cost and estimated annual operating costs[34]

| Item | Pre-operations | Operations (estimate) |
|---|---|---|
| Oaklands Hill wind farm | $194.5m | $2.5m per annum |

[33] SKM expenditure survey (2012)

[34] SKM expenditure survey (2012)



### Impact on Gross Regional Product

GRP is the total market value of goods and services produced in a region after deducting the costs of goods used up in the process of production (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.

Gross Value Added (GVA) is defined as total factor income plus taxes and less subsidies on production. Total factor income is made up of compensation of employees, gross operating surplus and gross mixed income.

Input-output modelling based on the typical make up of a wind farm and the expenditure data collected has generated the value added to date as outlined in Table 6-4.

- Table 6-3: Oaklands Hill wind farm estimated value added to date

| Item | Region | Victoria | Australia |
|---|---|---|---|
| **Pre-operations** | | | |
| Project value added to date | $27.7m | $106.3m | $144.6m |
| Per annum project value added to date | $15.8m | $60.7m | $82.6m |
| **Operations** | | | |
| Operations to date | $0.6m | $1.3m | $1.8m |

The estimated total value added to the region is some $27.7 million and the estimated per annum value added is $15.8m. This equates to a potential lift in the region's GRP of some 0.25% in the average construction year.

## 6.2. Assessment of employment effects

The Oaklands Hill wind farm pre-operations cost is some $194.5 million. Of this amount approximately $43.0 million (22%) is estimated to have been spent in the region. The estimate for Victoria and all of Australia is $111.0 million (57%) and $129.6 million (67%) respectively. Refer to Table 6-4.

- Table 6-4: Estimated expenditure by location (Oaklands Hill wind farm)[35]

| Item | Region | Rest of Victoria | Rest of Australia | All of Australia | Overseas | Total |
|---|---|---|---|---|---|---|
| Cost | $43.0m | $68.0m | $18.6m | $129.6m | $64.9m | $194.5m |
| % total | 22% | 35% | 10% | 67% | 33% | 100% |

[35] SKM expenditure survey (2012)



The Oaklands Hill wind farm was built over 21 months, from May 2010 to February 2012. On average over this period some 72 construction employees were employed in the region, either directly or by contractors engaged by the companies involved in constructing the wind farm. Employment numbers at peak of construction were some 114 workers.

These data provided by the construction companies do not tell the whole story. In addition to the employees in the region constructing the wind farm, there are also employees in other parts of Victoria and Australia that provided a range of construction and other services.

## Oaklands Hill wind farm employment

Table 6-5 shows the employment estimates for Oaklands Hill wind farm. The total reported average number of employees was 17 FTEs during development, 72 FTEs during construction and 14 FTEs during operations to date.

- Table 6-5: Estimated actual employment to date[36]

| Project | Development | | Construction | | Operations | |
|---|---|---|---|---|---|---|
| | Average | Peak | Average | Peak | Average | Peak |
| Oaklands Hill wind farm | 17 | 32 | 72 | 114 | 14 | 39 |

SKM modelling estimates that the total number of direct jobs resulting from the project was some 95 jobs in the region, 153 jobs in Victoria and 177 jobs in Australia. Refer to Table 6-6. These are average annualised full time equivalent figures, i.e. SKM's estimate of 153 direct jobs in Victoria is the average number of full time jobs created during the construction period of 21 months. It is a subset of the estimate for Australia which means that 24 direct jobs have been created outside of Victoria (177 minus 153 jobs).

- Table 6-6: Estimated employment due to development and construction activities

| Project | Region | Victoria | Australia |
|---|---|---|---|
| Direct jobs | 95 | 153 | 177 |
| Indirect and induced | 61 | 364 | 423 |
| Total jobs (Direct, indirect and induced) | 156 | 517 | 599 |

The bulk of the expenditure at the regional level would have related to the construction workforce resident in the region over the duration of the construction activities. This suggests that the Oaklands Hill wind farm project could have generated an annual average of some 177 direct FTE jobs across Australia compared with 95 direct FTE jobs created in the region. This leads to a multiplier of around 1.86.

[36] SKM expenditure survey (2012)



In addition to the direct jobs created by the project there will also be indirect jobs created based on the flow on effects of suppliers to the project that need to replenish their stocks (the production effect) and the flow on from the spending of wages and salaries of both direct and indirect workers (consumption effect). These indirect expenditures create further employment and input-output modelling estimates that the total number (direct, indirect and induced) of jobs resulting from construction and development of Oaklands Hill wind farm was 599 FTE jobs across Australia. Of these FTE jobs, 156 were created in the region and 517 in Victoria including the regional employment. This suggests a multiplier of some 3.8 for total jobs.

In addition to regular facility maintenance staff, there would need to be periodically contract work to maintain the site. This could potentially include such aspects as fence repairs, mowing, access road maintenance, electrical connection issues and servicing/maintenance of equipment including instruments, computers etc.

While survey data generated an operations average and peak employment of 14 and 39 persons respectively, it is likely that the majority were short term employees involved in post start up work and have since left the wind farm.

Modelling indicates that on-going operations of Oaklands Hill wind farm (excluding the post start up that is considered to be once off) will create a total of 11 jobs in the region, 31 jobs in Victoria and 35 jobs in Australia (direct, indirect and induced). SKM's estimate of 11 jobs in the region is a subset of the estimate for Victoria which is a subset of the estimate for Australia, i.e. 20 jobs have been created in the balance of Victoria (31 minus 11 jobs).

- Table 6-7: Estimated employment during on-going operations

| Project | Region | Victoria | Australia |
|---|---|---|---|
| Direct jobs | 4 | 9 | 9 |
| Indirect and induced | 7 | 23 | 26 |
| Total jobs (Direct, indirect and induced) | 11 | 31 | 35 |



## 6.3. Industry development

Three of the six organisations involved in developing, constructing and operating Oaklands Hill wind farm indicated that they had a policy of employing local contractors where possible.

As noted earlier the region has a range of businesses with the capability to provide services to the project and individuals with skills to meet employment requirements. These include but are not necessarily limited to:

- Domestic scale electricians;
- Transport operators;
- Competent machine operators;
- General labourers;
- Quarries; and
- Concrete businesses.

### Accommodation for on-site workers during construction

The survey indicated that the employees of consultants to the project and other non construction people working on the project stayed in hotel/motel accommodation. These people would generally visit the region for limited periods and the convenience and flexibility of a hotel/motel would outweigh any additional cost of a hotel/motel over rental accommodation. From interviews with local business owners, it appears that the project has helped to underpin a buoyant hotel/motel market with operators indicating that the project has led to higher occupancies and profitability.

Employees of Repower, the main construction contractor, use a variety of accommodation (Refer to Table 6-8) with 10% travelling from their own home in the region. This is likely to be local persons recruited to work on the project. It is anticipated that most of these will be living with their family.

The largest group of employees live in hotel/motel. This is followed by private rent and caravan park at 20% each and while some will be living with their family, others will be renting in a group situation with others workers or renting independently.

- Table 6-8: Accommodation type used by Repower employees

| Accommodation type | Oaklands Hill wind farm |
|---|---|
| Own Home | 10% |
| Private Rental | 20% |
| Hotel/Motel | 50% |
| Caravan Park | 20% |
| Construction Camp | 0% |
| Other | 0% |
| Total | 100% |



## 6.4. Qualitative assessment of the wind farm impact on the region

This section discusses the findings from interviews with local businesses, representatives from Southern Grampians Shire and representatives from contractors involve in this project.

The site visit indicated strong support from local businesses:

- Accommodation and food services providers have had a significant increase in sales over the period the wind farms have been in construction;
- Local contractors have been employed directly in the construction; and
- Other businesses in nearby towns seem to have increased business and be more buoyant as a result of the additional people and expenditure in the region.

Local businesses that have benefitted from contracts with the wind farm include:

- Domestic scale electricians;
- Transport operators;
- Competent machine operators;
- General labourers; and
- Quarries.

### Accommodation

A major flood in January 2011 closed off Grampians Road, the main tourist road between Halls Gap and Dunkeld. This severely limited access to Dunkeld and reduced the overnight tourists' trade. One accommodation business operator noted that the Oaklands Hill wind farm workers more than compensated for the loss in tourist business.

Many businesses have experienced their best turnover in 10 years. Occupancies before wind farm construction were in the order of 60% which increased to 75-85% as a result of construction.

However, one respondent suggested that Dunkeld has not received as many workers as originally anticipated due to Hamilton, Port Fairy and Warrnambool being bigger towns and thus being able to provide more services and amenities. Another respondent noted that while Glenthompson did benefit from the wind farm, it would have benefited more if residents had seized upon opportunities such as offering a laundering service and opened up more homes for rent.

Accommodation business operators reported:

- An increase in short term occupancies (one night to a few nights, primarily during the week);
- An increase in medium term occupancies of up to 3 months;
- An increase in longer term occupancies of 4 to 8 months;
- Some longer terms wind farm workers would return home during the weekends which allowed the business operators to lease the house to holidaymakers from Thursday to Saturday nights when room rates are higher;



- Peak trade occurred during construction, from January to August 2011;
- Wind farm workers like self contained places with cooking facilities;
- The extra income during the first few months of construction allowed the Community Caravan Park to purchase two additional caravans to meet demand.
- A general mix of general labour and executive market; note

## Food services

Many businesses have experienced an increase in food trade, from marginal to substantial. The areas of Dunkeld and Glenthompson have experienced marginal to small increases. The areas of Hamilton have experienced more trade. The primary reason cited for Dunkeld and Glenthompson's smaller market share were workers preference to live in Hamilton and residents in Glenthompson not maximising the opportunities presented. Since The Royal Mail Hotel (restaurant and hotel) is a unique food and overnight destination and targets the high end market, the wind farm did not affect its business or operations to a significant degree.

One food business operator noted that in addition to his regular general store (small goods, groceries, DVD hire and food), he started to operate a food van at the Oaklands Hill wind farm site.

## General retail and trade services

Brief conversations with other retail traders indicated that their business was up from both direct sales to wind farm employees and in some cases sales to other businesses that provide services to the wind farm workers.

Discussion with the lead technician for Oaklands Hill wind farm noted that they used many local contractors during construction such as installation of treatment plants and cable laying and electrical works. All vehicles were locally serviced in Hamilton and Repower held an account with the Glenthompson Roadhouse for food and fuel. Business at the Roadhouse increased significantly and during the peak of construction, Repower consumed 1,000 to 2,000 litres of diesel per day.

In discussion with Keppel Prince in Portland, it is noted that the Oaklands Hill wind farm project has been good for business. They provided 110 to 120 full time staff (around 80 staff in the direct manufacture of towers and 30 on site) for 4 to 6 months. In addition to the towers, they also provided the foundations and internal components (e.g. ladders and platforms) of the wind farm. All of Keppel Prince's resources and supplies are locally sourced and all their employees are locally based. Now that Oaklands Hill wind farm is complete and Macarthur wind farm it is nearing completion, they have reduced the number of staff.

The current arrangements during operations include:

- Four full time staff to manage the day to day operations. They are all locally based;
- One part time cleaner, also locally based;



- Part time contractors to service treatment plants (routine maintenance) and maintain the internal roads;
- Regular use of local contractors to repair fences, mow lawns etc; and
- Four cars to be locally serviced in Hamilton, 3 times a year.

## Transport

Noske provided all the logistical services of the wind farm components to site. The generators, gearbox, hubs and blades were collected from the Port of Portland whereas the towers were collected from Keppel Prince in Portland. In discussion with Noske, it is noted that the Oaklands Hill wind farm project was a roll on from other work and as a result, they did not recruit more staff for the project. The majority of staff provided were from local areas.

## Tourism

This section was developed in consultation with Southern Grampians Shire. There are three visitor information centres within Southern Grampians Shire located at Hamilton, Dunkeld and Coleraine.

Hamilton visitor information centre is the most frequented visitor centre in the Shire and statistics shows very consistent visitation from 36,200 to 39,300 over the past seven years (2005 to 2011). The centre provides amenities such as a meeting space, gift shop and public toilets.

Statistics from Dunkeld visitor information centre shows lower and more variable visitation from 17,400 to 24,800 over the past seven years (2005 to 2011). The centre provides amenities such as a meeting space, a kitchen, photocopying facilities and public toilets.

The Shire is a cultural, heritage and food destination for many. The peak of tourism generally occurs during the start of the year, from January to April and then again in October and November. It is well known for events, galleries and museums including the Sheepvention, Hamilton Art Gallery, The Waiting Room Gallery, Dunkeld Historical Museum, Hamilton History Centre and Glenthompson Brickworks. Sheepvention is the region's largest farming event made up of competitions and entertainment as well as showcasing the history of sheep in Australia. Darriwill Farm in Hamilton is a gourmet food and wine store and The Royal Mail Hotel located in Dunkeld is a high profile restaurant and has recently been awarded three chef hats by The Age Good Food Guide 2012. Other reasons for travel to the Shire include hiking and sightseeing through the Grampians National Park, Wannon Falls, Nigretta Falls and the Hamilton botanic gardens.

Tourism makes a substantial contribution to the local economy by bringing in money which is then directly spent on a wide range of services from retail to accommodation, food and attractions. The direct expenditure then flows onto other businesses that rely on tourism operators such as tradesmen, builders, accountants and lawyers. In 2007, economic impact of direct expenditure to the Shire was estimated at $48.6 million per annum. The indirect expenditure would make this figure significantly higher. To date, the Shire is not aware of

any negative feedback from visitors and has not received any enquiries about a tour of Oaklands Hill wind farm

## Community benefits

It was noted that a number of farmers were finding it difficult to make ends meet during the extended period of drought over most of the last decade. Since the break in 2010, farmers have become more optimistic. However, farmers who are also landowners of the Oaklands Hill wind farm are benefiting from a secure diversified income stream. The project has provided further benefits beyond direct lease payments to many of these farmers, by providing employment opportunities and by creating a demand for under-utilised assets, including previously unleased accommodation. The dominant industry in the area is agriculture where some farmers believe that besides farming, the area does not offer many other job opportunities. Some farmers believe that the wind farm will allow residents other job opportunities and more choice in the area.

One farmer landowner noted that the internal roads built for access to the turbines have allowed better access to parts of his farm previously difficult to get to. This has reduced the time it takes to conduct farming activities and subsequently increased productivity. However it is noted that one of the access roads on a neighbouring plot of land is the same as the farm road which has adverse impact on farming activities.

AGL has committed some $50,000 in support funding to aid the Glenthompson business community. To access the fund, businesses were asked to make submissions to the Glenthompson community committee. The committee then prioritised the projects and to date, no projects have commenced. In addition, AGL has committed some $10,000 per annum for the next 25 years to salinity control programs and brolga habitat enhancement each. Table 6-9 outlines the recipients of the community support fund as of August 2012 and has not yet been finalised.

- Table 6-9: List of community support funds (Oaklands Hill wind farm)[37]

| During construction | | |
|---|---|---|
| The Hall Committee | For new tables | $5,000 |
| Lions Park Shelter | | $4,500 |
| Ambulance | For inflatable stretchers and splints | $3,230 |
| Rec Reserve | For new scoring shed | $1,500 |
| Walking track | New creek crossing | $10,000 |
| Rec Reserve | Netball court resurfacing | $10,000 |
| Rec Reserve | Netball lighting | $3,000 |
| Lions Park | Power upgrade and skate park | Not known |
| Country fire authority | New support vehicle (subject to a successful grant application) | $8,000 |

[37] This list is up to date as of August 2012



| | | |
|---|---|---|
| Sub-total | | $50,000 |
| Post construction | | |
| Salinity control programs | $10,000 pa for 25 y ears | $250,000 |
| Brolga habitat enhancement | $10,000 pa for 25 years | $250,000 |
| Sub-total | | $500,000 |

## 6.5. Other economic impact

Information was also provided on money spent directly in the region over each phase of the project. The total is some $35.8 million (Refer to Table 6-10). The bulk of this expenditure has been made over the construction phase $34.3 million, with some $0.4 million over the development stage and $1.1 million related to operations. Some 77% of detailed cost identified was spent in Portland.

- Table 6-10: Total estimated expenditure in the region to date[38]

| Type | Glenthompson | Dunkeld | Port Fairy | Warrnambool | Portland | Hamilton | Others in region | Total in region |
|---|---|---|---|---|---|---|---|---|
| Accommodation, meals and other incidental spending | $443k | $811k | | $82k | $243k | $749k | | $2,328k |
| Council and other regulatory fees and charges | | | | $10k | $0k | $130k | | $140k |
| Community funds or sponsorship | $120k | | | | | | | $120k |
| Services e.g. wind monitoring, geotechnical investigations | $33k | | | $153k | $15k | $33k | $105k | $340k |
| Others | $3,513k | | | | $27,311k | $1,907k | | $32,730k |
| Total | $4,159k | $811k | | $246k | $27,569k | $2,819k | $105k | $35,708k |
| % total | 12% | 2% | 0% | 1% | 77% | 8% | 0% | 100% |

[38] SKM expenditure survey (2012)

## 6.6. Summary

Oaklands Hill wind farm has:

- A pre-operations total expenditure of $194.5 million;
- An on-going operational expenditure of some $2.5 million per annum. The majority will be spent in the region;
- Generated a pre-operations value added of some $27.7 million and a operations value added to date of some $0.6 million in the region;
- In 2011, the estimated value added of $15.8 million to the region represents a potential lift in the region's Gross Regional Product of 0.25%;
- On average, 72 full time equivalent employees worked at the wind farm during construction;
- The project created some 156 total jobs in the region, 517 total jobs in Victoria and 599 total jobs in Australia (direct, indirect and induced); and
- Approximately four full time staff, 1 part time staff and some contractors will be employed during on-going operations and maintenance of the wind farm.



# 7. Economic impact of Macarthur Wind Farm

This chapter provides a discussion around the project cost of Macarthur wind farm and considers the economic impact of the wind farm on the following; direct expenditure in the region, employment and Gross Regional Product (GRP). This chapter also provides a qualitative assessment of the wind farm based on interviews with local business owners and Council representatives during August and September 2012.

The construction of Macarthur wind farm commenced in November 2010 and to date it has been under construction for 22 months. Completion is expected in the first quarter of 2013.

## 7.1. Assessment of the project cost and impact on GRP

The Macarthur wind farm cost to date is shown in Table 7-1 below.

- Table 7-1: Macarthur wind farm cost by phase (cost to date) [39]

| Item | Development | Construction | Total |
|---|---|---|---|
| Macarthur wind farm (cost to date) | $29.1m | $819.4m | $848.5m |
| % total | 3% | 97% | 100% |

The Macarthur wind farm pre-operations cost in Table 7-2 represents the development and construction cost to date plus the estimated cost to complete at $135.5 million. Based on these actual and estimated costs to complete, the pre-operations total cost for Macarthur wind farm and supporting infrastructure is $984.0 million.

Tarrone substation is complete as of September 2012 and the total cost came to $27.0 million.

The estimated annual operating cost is $16.7 million and this is based on adjusting the Oaklands Hill wind farm operating cost (Refer to Table 6-2) by a proportional increase in wind farm capacity. A substantial amount of the operating costs will be spent in the region.

- Table 7-2: Macarthur wind farm and Tarrone substation pre-operations cost and estimated annual operating costs [40]

| Item | Macarthur wind farm pre-operations | Tarrone substation pre-operations | Operations (estimate) |
|---|---|---|---|
| Cost | $984.0m | $27.0m | $16.7m per annum |

[39] SKM expenditure survey (2012)

[40] SKM expenditure survey (2012)



### Impact on Gross Regional Product

For GRP and GVA definition, please refer to section 6.1.

Input-output modelling based on the typical make up of a wind farm and the expenditure data collected has generated the value added to date as outlined in Table 7-3. It is noted that some contractors consulted as part of this study could not provide expenditure data by where it was spent. As such, SKM used the Macarthur wind farm expenditure data provided by AGL and spread the cost by location based on Oaklands Hill proportions.

- Table 7-3: Macarthur wind farm and Tarrone substation estimated value added to date

| Item | Region | Victoria | Australia |
|---|---|---|---|
| **Pre-operations** | | | |
| Project value added to date | $119.0m | $458.0m | $600.1m |
| Per annum project value added to date | $51.0m | $196.3m | $257.2m |

The estimated value added to date to the region is some $119.0 million. The 2011 value added estimate at $51.0 million represents a potential lift in the Gross Regional Product of 0.79%. The gross value added was based on the total cost to date, that is the sum of the Macarthur wind farm cost to date of $848.5 million and Tarrone substation total cost of $27.0 million.

## 7.2. Assessment of employment effects

At completion, Macarthur wind farm (plus supporting infrastructure) and Tarrone substation will cost some $984.0 million and $27.0 million respectively. Of this combined total approximately $203.4 million (20%) is estimated to be spent in the region. The estimate for Victoria and all of Australia is $512.8 million (51%) and $617.6 million (61%) respectively. Refer to Table 7-4.

- Table 7-4: Estimated expenditure by location (Macarthur wind farm and Tarrone substation) [41]

| Item | Region | Rest of Victoria | Rest of Australia | All of Australia | Overseas | Total |
|---|---|---|---|---|---|---|
| Macarthur wind farm | $198.0m | $301.1m | $102.0m | $601.2m | $382.8m | $984.0m |
| Tarrone substation | $5.4m | $8.3m | $2.8m | $16.5m | $10.5m | $27.0m |
| % total | 20% | 31% | 10% | 61% | 39% | 100% |

So far, Macarthur wind farm has been under construction for 22 months, from November 2010 onwards. On average over this period some 416 construction employees were employed in the region, either directly or by contractors engaged by the companies involved

[41] SKM expenditure survey (2012)



in constructing the wind farm. Employment numbers at peak of construction were some 631 workers.

These data provided by the construction companies does not tell the whole story. In addition to the employees in the region constructing the wind farm, there are also employees in other parts of Victoria and Australia that provided a range of construction and other services.

## Macarthur wind farm and Tarrone substation employment

Table 7-5 shows the employment estimates for the project. The total reported average number of employees is 26 during development and 416 during construction to date.

- Table 7-5: Estimated actual employment to date[42]

| Project | Development | | Construction | |
|---|---|---|---|---|
| | Average | Peak | Average | Peak |
| Macarthur wind farm and Tarrone substation | 26 | 78 | 416 | 631 |

SKM modelling estimates that the total number of direct jobs resulting from the project is some 478 jobs in the region, 595 jobs in Victoria and 644 jobs in Australia. Refer to Table 7-6. These are average annualised figures, i.e. SKM's estimate of 595 direct jobs in Victoria is the average number of jobs created during the full construction period of 28 months. It is a subset of the estimate for Australia which means that 49 direct jobs have been created outside of Victoria (644 minus 595 jobs).

- Table 7-6: Estimated employment due to development and construction activities

| Project | Region | Victoria | Australia |
|---|---|---|---|
| Direct jobs | 478 | 595 | 644 |
| Indirect and induced | 241 | 1379 | 1,539 |
| Total jobs (Direct, indirect and induced) | 719 | 1,973 | 2,183 |

The bulk of the expenditure at the regional level would have related to the construction workforce resident in the region over the duration of the construction activities. This suggests that the Macarthur wind farm project could have generated an annual average of some 644 direct FTE jobs in Australia compared with 478 jobs created in the region. This leads to a multiplier of around 1.3.

In addition to the direct jobs created by the project there will also be indirect jobs created based on the flow on effects of suppliers to the project that need to replenish their stocks (the production effect) and the flow on from the spending of wages and salaries of both direct and indirect workers (consumption effect). These indirect expenditures create further

[42] SKM expenditure survey (2012)



employment and input-output modelling estimates that the total number (direct, indirect and induced) of jobs as a result of the development and construction of Macarthur wind farm (at completion) is 2,183 FTE jobs across Australia, a multiplier of approximately 3 for total jobs. Of this average annual FTE, 719 jobs relates to the region and 1,973 relates to Victoria including the regional employment.

In addition to regular facility maintenance staff, there would need to be periodically contract work to maintain the site. This could potentially include such aspects as fence repairs, mowing, access road maintenance, electrical connection issues and servicing/maintenance of equipment including instruments, computers etc.

Modelling indicates that on-going operations of Macarthur wind farm will create a total of 41 jobs in the region, 103 jobs in Victoria and 115 jobs in Australia (direct, indirect and induced).

- Table 7-7: Estimated employment during on-going operations

| Project | Region | Victoria | Australia |
|---|---|---|---|
| Direct jobs | 17 | 28 | 30 |
| Indirect and induced | 24 | 75 | 85 |
| Total jobs (Direct, indirect and induced) | 41 | 103 | 115 |

Leighton Contractors and Vestas Consortium provided an estimated operations workforce of 17 full time staff. However in addition to these workers, they have planned for one part time staff and 10 contractors to be employed during operations. A detailed description of the roles and responsibilities is provided in Table 7-8.

- Table 7-8: Forecast of Macarthur wind farm operations staff

| Role | Quantity | Responsibility |
|---|---|---|
| Site manager | 1 X FT | Full time management of Macarthur wind farm |
| Site supervisor | 1 X FT | Supervise site technicians and subcontractors on day to day activities. |
| Service technicians | 12 X FT | Day to day operations and maintenance of the turbines (each turbine needs to be maintained every 6 months for the first year and then every 12 months for all subsequent years) |
| Site administrator | 1 X FT | Administration of all site documentation and visitor requirements |
| Warehouse coordinator | 1 X FT | Day to day control of warehouse stock incoming and outgoing, coordination of site deliveries and pickups |
| Site planner | 1 X FT | Planning of all site maintenance and construction activities |
| Cleaner | 1 X PT | To clean the site office twice a week |
| Contractor | 1 X as needs | Contractor to conduct removal of site waste on a weekly basis |
| Contractor | 1 X as needs | Contractor to remove waste oil from site and dispose of it (estimated at 3-4 times per year) |



| | | |
|---|---|---|
| Contractor | 3 X as needs | Contractors to conduct maintenance of site roads (estimated at three persons for 3-5 weeks per year) |
| Contractor | 1 X as needs | Contractor to conduct service maintenance of forklift (estimated at 4 times per year) |
| Contractor | 1 X as needs | Contractor to conduct service maintenance of fire extinguishers (estimated at two times per year) |
| Contractor | 1 X as needs | Contractor to conduct breakdown maintenance of facility plumbing works (estimated at 3-5 days per year) |
| Contractor | 2 X as needs | Contractor to conduct site fence maintenance (estimated at 2-4 weeks per year) |

## 7.3. Industry development

Three of the six organisations involved in developing, constructing and operating Oaklands Hill wind farm indicated that they had a policy of employing local contractors where possible.

As noted earlier the region has a range of businesses with the capability to provide services to the project and individuals with skills to meet employment requirements. These include but are not necessarily limited to:

- Domestic scale electricians
- Transport operators
- Competent machine operators
- General labourers
- Quarries, and
- Concrete businesses.

### Accommodation for on-site workers during construction

Experience with Oaklands Hill wind farm and other wind farm projects indicates that employees of consultants to projects and other non construction people working on projects generally stay in hotel/motel accommodation. These people would generally visit the region for limited periods and the convenience and flexibility of a hotel/motel would outweigh any additional cost of a hotel/motel over rental accommodation. Interviews with accommodation service providers located in Port Fairy indicate that the area experienced a fairly substantial increase in business. Staff expenditure survey supports this assessment. Interestingly the majority of those surveyed (119 respondents) indicate that they are based in Warrnambool while working on the wind farm.



## 7.4. Qualitative assessment of the wind farm impact on the region

This section discusses the findings from interviews with local businesses, representatives from Moyne Shire and representatives from contractors involve in this project. Benefits are similar to the Oaklands Hill wind farm project and as such, some sections have been duplicated from section 6.4.

The site visit indicated strong support from local businesses:

- Accommodation and food services providers have had a significant increase in sales over the period the wind farms have been in construction
- Local contractors have been employed directly in the wind farms' construction, and
- Other businesses in the region's towns seem to have increased business and be more buoyant as a result of the additional people and expenditure in the region.

Local businesses that have benefitted from contracts with the wind farm include:

- Domestic scale electricians
- Transport operators
- Competent machine operators
- General labourers
- Quarries, and
- Concrete businesses that appear to have done particularly well and put on employees.

### Staff expenditure survey

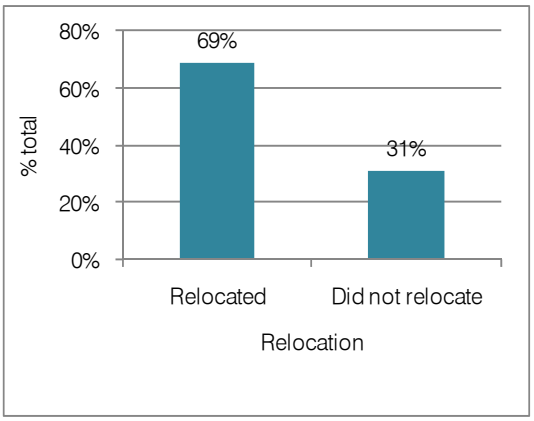
SKM conducted a staff expenditure survey. The survey was conducted one morning during a toolbox safety meeting, week starting 10 September 2012. The survey questionnaire asked for the age, gender, current length of employment, future length of employment, employment sector, work type etc. Refer to Figure 7-1 through to Figure 7-3.

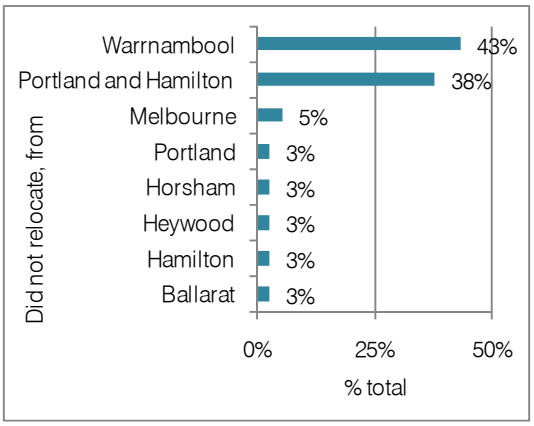
Summary of the findings:

- A total of 119 respondents;
- Some 69% of staff relocated to the region as a result of this project. Refer to Figure 7-1;
- Of those who did not relocate, 49% are from Warrnambool and 44% are from Portland or Hamilton. Refer to Figure 7-1;
- While on the job, the majority of staff (50%) are based in Warrnambool. Refer to Figure 7-2;
- A typical staff member would spend approximately 30% of total expenditure on accommodation;
- Some 48% of total expenditure was spent in Warrnambool;
- Some 50% of staff are aged between 21 and 40 years old;
- Some 35% of staff are aged between 41 and 50 years old;
- The majority of staff are male (96%);

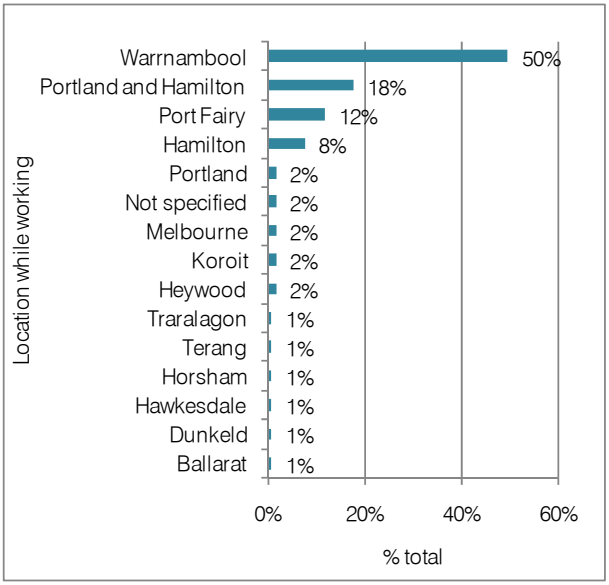
- The majority of staff work in construction (69%) followed by projects (14%);
- Some 29% of staff have been working at the wind farm for over 12 months, followed by 25% of staff having worked between 6 and 12 months; and
- Some 31% of staff expects to work for less than one month.

■ Figure 7-1 Macarthur wind farm relocation figures (left) and for persons who did not relocate, where they are from (right) [43]



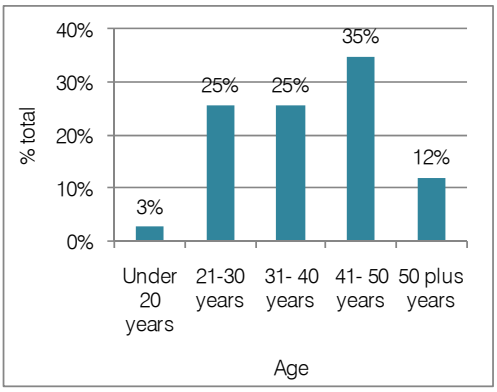



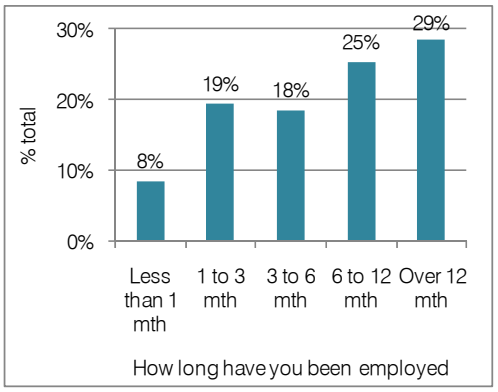

■ Figure 7-2 Location of workforce while working

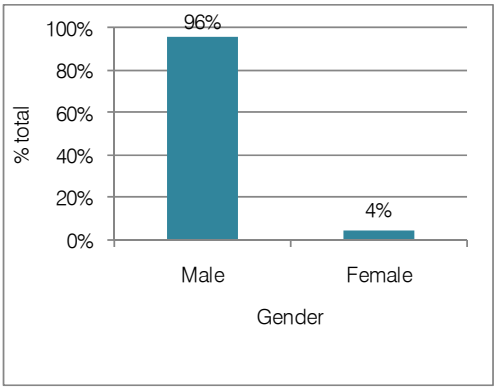


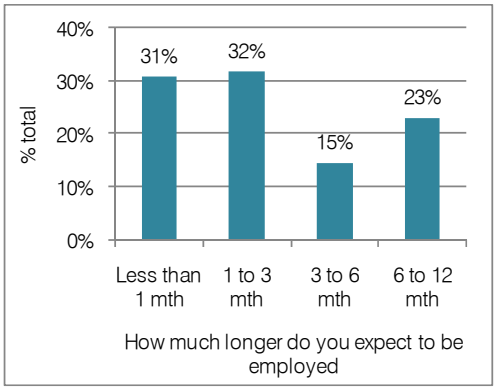

[43] SKM staff expenditure survey (2012)

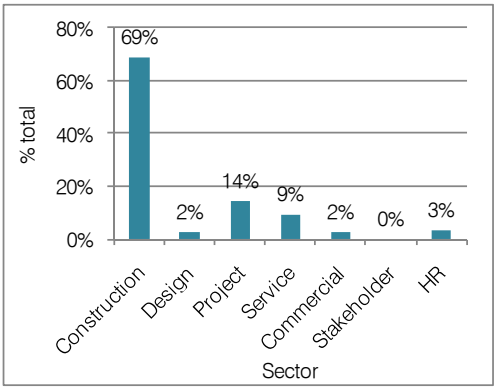
■ Figure 7-3 Macarthur wind farm staff expenditure survey key results[44]

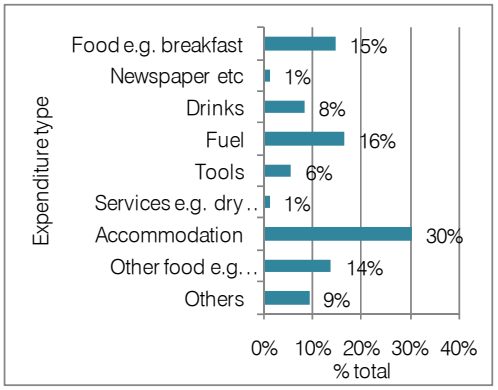


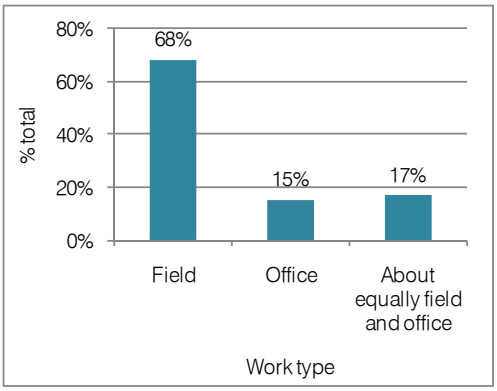



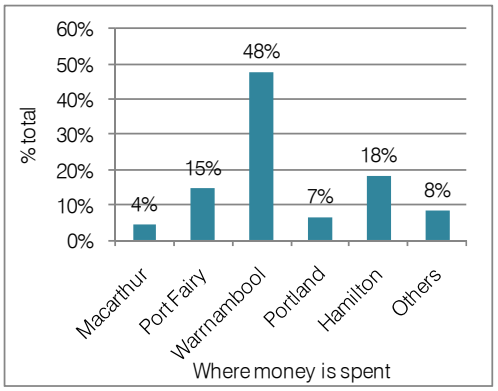




[44] SKM staff expenditure survey (2012)



## Accommodation

Port Fairy has experienced a fairly substantial increase in occupancy, from 50% to 60%. The increase in demand as well as the workers ability to pay higher rates pushed prices from $300-350 per week to $380-450 per week. The workers leased properties that would normally be occupied by permanent long term local residents. The peak was during the first half of construction, from August 2011 to end of July 2012 and as of September 2012, the majority of workers have departed. Port Fairy is attractive to families where some temporarily relocated with their families for the convenience, quietness, community spirit and fishing opportunities. The market split is about half and half between general labour and executive market.

Leighton Contractors and Vestas Consortium rented up to 60 houses at a time on a short term basis during the project. These rental houses are located across the region.

## Food services

Areas where workers stayed experienced increase in trade however during the day, workers are able to purchase food from the on-site canteen and take away business. The business started operations in May 2011 and will continue until under the end of construction. The business employees are made up of the owner (present most of the time) and two other staff; one full time and another part-time worker (three days a week). Both workers have come from the hospitality and food industry and did not need to be trained up. All staff are from the local area and business is very good.

They sell a variety of fare to suit the tastes of the workforce and the owner has indicated that it is very good business and would like to continue to work with wind farm developers. There is no competition since the site is remote with the nearest town, Macarthur being 18km away.

## General retail, trade and manufacturing services

Brief conversations with other retail traders indicated that their business was up from both direct sales to wind farm employees and in some cases sales to other businesses that provide services to the wind farm workers.

In discussion with KL quarries in Hamilton, it was noted that they provided the materials (and delivery) for road construction and towards the end of this period, they provided some grading services. They are generally busy during the summer and the wind farm kept them particularly busy through 2011. As a result of the wind farm and associated projects that occurred at the same time, they employed 3-4 casual staff in addition to their permanent workforce of four employees. Now that the roads are complete, they have reduced the number of casual employees.

In discussion with Keppel Prince in Portland, it was noted that the Macarthur wind farm project has been good for business. They provided 150 to 170 full time staff (around 120 staff involved in the direct manufacture of towers and 40 on site) for 12 to 14 months. In addition to the 80 towers, they also provided craneage and services such as the unloading



of tower and turbines. All of Keppel Prince's resources and supplies are locally sourced and all their employees are locally based. Now that Oaklands Hill wind farm is complete and Macarthur wind farm it is nearing completion, they have reduced the number of staff.

The expected arrangements during operations are:

- Some 17 full time staff to manage the day to day operations. They are all locally based;
- One part time cleaner, also locally based;
- Some ten contractors responsible for various activities. Refer to Table 7-8; and
- Six vehicles to be serviced at 10,000km intervals which equates to an estimated three services per vehicle per year. It is estimated that each vehicle will required 18,000 litres of fuel per year.

### Transport

Noske provided all the logistical services of the wind farm components to site. The generators, gearbox, hubs and blades were collected from the Port of Portland whereas 80 towers were collected from Keppel Prince in Portland and 60 towers from RPG in South Australia. Noske recruited more staff as a result of Macarthur wind farm and the majority of staff provided were from local areas.

In addition to logistical services, Noske acted as the agent for sea freight, managed the storage of wind farm components at the Port of Portland and provided some crane services to load and unload components at the port and on site.

### Roads

The local road network has been and remains the subject of much concern, scrutiny and discussion across the region with regular media coverage and community voicing concerns to the local council and other authorities over a prolonged period. This is confirmed via Moyne Shire Performance Indicators "Community satisfaction score for municipal roads and footpaths", where satisfaction scores have averaged only 45% since 2006[45] .

In recognition of these concerns, stringent conditions were applied to the construction phase of the project through the Planning Permit which in turn placed an obligation on the developer to have endorsed Traffic Management Plans in place. Compliance with these obligations has seen the project invest over $10 million into local roads; these works have included widening, strengthening and in some cases complete rebuild of roads and road sections local to the wind farm and Tarrone Terminal Station. In particular, the multimillion dollar upgrade of the Macarthur Hawkesdale Road addresses a Key Result for Moyne Shire's Physical Services as highlighted in the Shire's 2010/2011 Annual Report.

In addition to the above investments, both Moyne Shire and Vicroads have been provided with funding from AGL and its partners to assist with road maintenance programs. This

[45] Moyne Shire Council, (2012), Annual Report for the year ending 30 June, 2012



commitment has been over and above the obligations set down in the traffic management plans.

During the peak of construction there were up to 95 materials haulage round trips per day from various quarries to the wind farm site with a cumulative distance of over 4 million kilometres travelled.

Further there have been in excess of 1,100 over-dimensional and escorted loads hauled from Portland and RPG in Adelaide to the site.

### Moyne Shire owned assets

Moyne Shire owns and operates the Mount Shadwell Quarry at Mortlake and this quarry has been a key materials resource provider to the project for internal roads construction. Moyne Shire's published information for 2010/11 shows a 60% increase on forecast demand for this quarry, equating to a budget surplus of over $1 million. It is understood that the majority if not the entire surplus was as a result of sales to Macarthur wind farm.

### Tourism

There are two visitor information centres within Moyne Shire which located at Port Fairy (accredited) and Mortlake (not accredited).

Port Fairy visitor information centre is the most frequented visitor centre in the Shire and statistics shows very high and very consistent visitation from 69,400 to 75,800 over the past seven years (2005 to 2011). There is a 12 persons meeting room at the centre and they assist visitors with accommodation enquiries but they do not have an online booking system.

The peak of tourism generally occurs during summer around December and January. The low season is during winter, from June to August.

The Shire is very diverse with many natural attractions, historical properties, coastal reserves and festivals and events. Port Fairy is a particularly popular tourist destination for couples and families. It is filled with charming19$^{th}$ century architecture and offers many coastal activities such as fishing and sailing.

Other attractions within the shire include Koroit Village and Tower Hill Reserve, Mt. Eccles National Park, Hopkins Falls, Yambuk Lakes and Mt. Shadwell at Mortlake. Moyne Shire is completely within the Kanawinka Geotrail, one of Australia's most extensive volcanic regions.

Summary of the Moyne shire tourism and marketing strategy 2010-2015:

- Tourism is an important industry for Moyne Shire and contributes an estimated $63 million annually to the local economy;
- It generates around 1,700 local jobs and a key driver of regional investment and development; and
- Macarthur wind farm has been identified as an opportunity to enhance tourism infrastructure



To date, the Shire is not aware of any negative feedback from visitors although they are curious and have enquired about wind farm tours.

## Community benefits

Please note that since some of the community benefits are identical to Oaklands Hill wind farm, sections of this chapter are a duplicate of the corresponding section from the economic impact assessment of Oaklands Hill wind farm.

It was noted that a number of farmers were finding it difficult to make ends meet during the extended period of drought over most of the last decade. Since the break in 2010, farmers have become more optimistic. However, farmers who are also landowners of the Macarthur wind farm are benefiting from a secure diversified income stream. The project has provided further benefits beyond direct lease payments to many of these farmers, by providing employment opportunities and by creating a demand for under-utilised assets. The dominant industry in the area is agriculture where some farmers believe that besides farming, the area does not offer many other job opportunities. Some farmers believe that the wind farm will allow residents other job opportunities and more choice in the area. The wind farm will employ no less than 17 full time employees and many other part-time staff and contractors to support major servicing and repair activities. This will make it the biggest employer in the immediate area.

One farmer landowner noted that the internal roads built for access to the turbines have allowed better access to parts of his farm property which previously were difficult to get to. This has reduced the time it takes to conduct farming activities and subsequently increased productivity. The landowner stated that while hardstands and internal roads take up approximately 1% of the land on his farm, the increase in productivity more than compensates for the loss in land as on-farm movement of agricultural inputs such as fertiliser has become more efficient and possible over a broader range of seasonal conditions. The internal open access roads means farmers and their staff are able to commence and cease work quicker and it has also clearly increased occupancy health and safety.

AGL has committed some $100,000 in community support fund to the area. The fund was administered by Moyne Shire with applications referred to the local community groups of Macarthur Advancement and Development Association (MADA) and Hawkesdale and District Advisory Committee (HADAC) for prioritisation prior to approval. The final list of approved funding is summarised in Table 7-9.

In addition to these grants the Hawkesdale Scout group received a further $3,500 to complete their kayak purchases and the Macarthur Camp Draft Committee received $600 in sponsorship.



- Table 7-9: List of community support funds (Macarthur wind farm)

| Recipients | Description | Amount |
|---|---|---|
| Community emergency response team - Hawkesdale | Completion of shed fit out | $1,600 |
| Community emergency response team - Hawkesdale | Station upgrade works | $1,435 |
| Country fire authority - Macarthur | Contribution toward new utility | $9,000 |
| Rural fire brigade - Hawkesdale | Fire fighting unit - rapid spray | $4,695 |
| Hawkesdale P-12 College | Camping trailer (Part) | $6,000 |
| Hawkesdale P-12 College | Playground equipment | $10,000 |
| Swimming Pool - MCR | Defibrillator | $2,600 |
| Mens Shed - Macarthur | Air conditioner and installation | $4,032 |
| South west healthcare - MCR | Shade sail and soft fall equipment | $7,082 |
| South west healthcare - MCR | Video conferencing unit | $4,055 |
| Camp Draft – MCR | Sponsorship | $600 |
| Hawkesdale Scout group | Canoes and kayaks and safety Gear | $1,500 |
| Macarthur advancement and development association | RV dump point | $5,000 |
| Macarthur advancement and development association | Recreational Vehicle power points | $5,000 |
| Emily Huglin from Hawkesdale P-12 College | Alternative to Schoolies Program – Philippines | $2,000 |
| Swimming Pool - Hawkesdale | Defibrillator and resuscitation Unit | $2,927 |
| Willatook Action Group | Willatook Hall upgrade | $10,000 |
| Macarthur primary school parents association | Blinds | $3,795 |
| Hawkesdale recreation reserve | Change rooms upgrade | $8,000 |
| Macarthur community health | Blood centrifuge | $3,335 |
| Macarthur pre-school | Photocopier | $1,500 |
| Macarthur bowling club | Skillion | $5,000 |
| Macarthur pony club | Poly water tank and trough | $2,000 |
| Sub-total | | $100,000 |

## 7.5. Other economic impact

Information was also provided on money spent directly in the region over each phase of the project. The total is some $10.6 million (Refer to Table 7-10) which is substantially less than the expenditure identified for Oaklands Hill wind farm. This is due to some contractors consulted as part of the project not being able to provide expenditure or employment data. Some 82% of detailed cost identified was spent in Macarthur.



- Table 7-10: Estimated expenditure by type in the region (to date)

| | Macarthur | Port Fairy | Warrnambool | Portland | Hamilton | Others in Region | Total in Region |
|---|---|---|---|---|---|---|---|
| Accommodation, meals and other incidental spending | $2k | $16k | $139k | $0k | $865k | $2k | $1,024k |
| Council and other regulatory fees and charges | $0k | $250k | $0k | $0k | $0k | $420k | $670k |
| Community funds or sponsorship | $65k | $0k | $0k | $0k | $0k | $65k | $130k |
| Services e.g. wind monitoring, geotechnical investigations | $0k | $0k | $0k | $0k | $0k | $0k | $0k |
| Others | $1,700k | $0k | $6k | $0k | $114k | $0k | $1,820k |
| Total | $8,767k | $266k | $145k | $0k | $979k | $487k | $10,644k |
| % total | 82% | 2% | 1% | 0% | 9% | 5% | 100% |



## 7.6. Summary

Macarthur wind farm has:

- A pre-operations cost to date of $848.5 million;
- A pre-operations estimated cost to complete of $135.5 million;
- A pre-operations total cost of $984.0 million;
- Tarrone substation is complete as of September 2012 and the total cost came to $27.0 million;
- An on-going operational expenditure of some $16.7 million per annum. The majority will be spent in the region;
- To date (over 22 months), an estimated value added of some $119.0 million to the region;
- In 2011, the estimated value added of $51.5 million to the region represents a potential lift in the region's Gross Regional Product of 0.79%;
- On average, 416 full time equivalent employees worked at the wind farm during construction;
- The project created some 719 total jobs in the region, 1,973 total jobs in Victoria and 2,183 total jobs in Australia (direct, indirect and induced); and
- Approximately 17 full time staff, 1 part time staff and 10 contractors will be employed during on-going operations and maintenance of the wind farm.



# Appendix A: References

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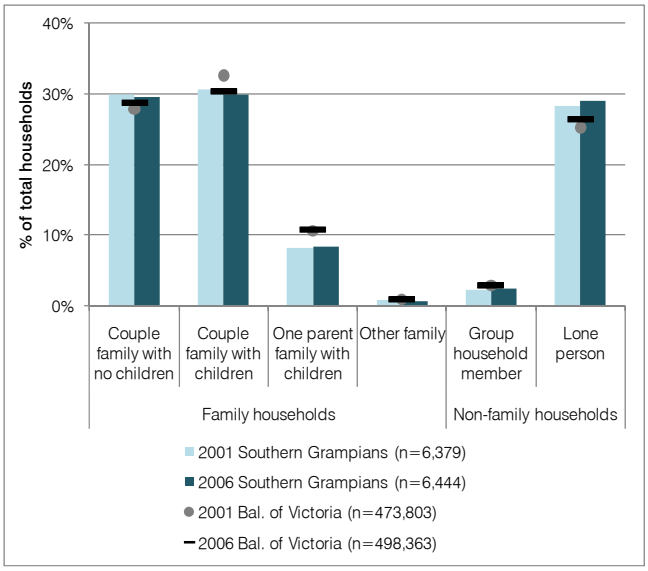
# Appendix B: Socio-economic profile (additional data)

## Household Composition

Reflecting the aging of the population, all LGAs have experienced a change in household composition. Appendix Figure B-1 to B-4 that couple families with no children have increased, couple families with children have decreased and lone person households have increased since the 2001 census. These trends are also apparent for the balance of Victoria.

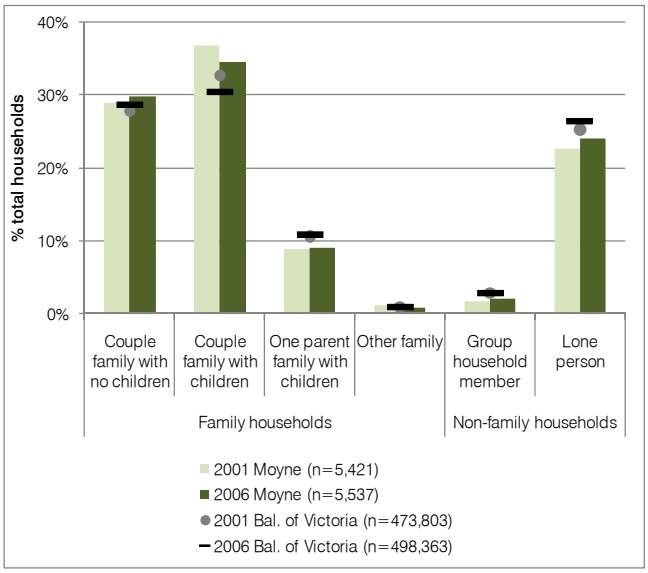
- Appendix Figure B-1 Household composition for Southern Grampians Shire as of the 2001 and 2006 census[46,47]



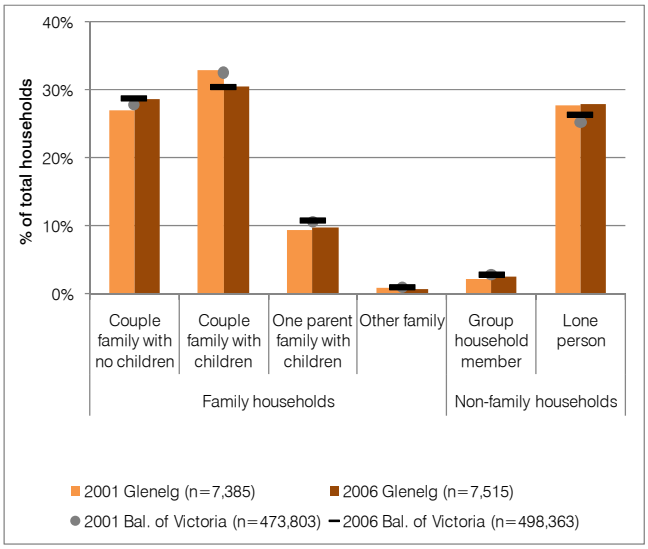

[46] Australian Bureau of Statistics, (2003), *Cat. No. 2005 Community Profile Series based on place of enumeration.*

[47] Australian Bureau of Statistics, (2007), *Cat. No. 2005 Community Profile Series based on place of usual residence.*

■ Appendix Figure B-2 Household composition for Moyne Shire as of the 2001 and 2006 census[48,49]




Appendix Figure B-3 Household composition for Glenelg Shire as of the 2001 and 2006 census[50,51]



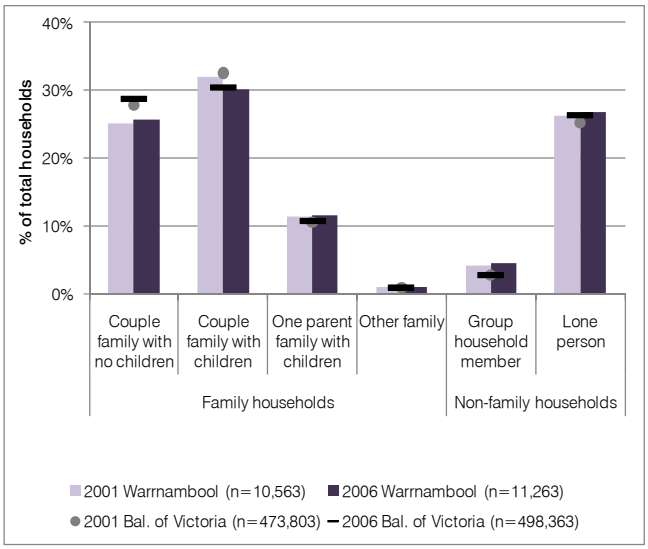

[48] Australian Bureau of Statistics, (2003), *Cat. No. 2005 Community Profile Series based on place of enumeration.*

[49] Australian Bureau of Statistics, (2007), *Cat. No. 2005 Community Profile Series based on place of usual residence.*

[50] Australian Bureau of Statistics, (2003), *Cat. No. 2005 Community Profile Series based on place of enumeration.*

[51] Australian Bureau of Statistics, (2007), *Cat. No. 2005 Community Profile Series based on place of usual residence.*

- Appendix Figure B-4 Household composition for City of Warrnambool as of the 2001 and 2006 census[52,53]




## Migration

The number of residents born in Australia, Germany, Netherlands, New Zealand and United Kingdom continue to outnumber those born elsewhere. However Southern Grampians and Moyne Shire have experienced a net migration from those born in other countries. The opposite is true for Glenelg Shire and Warrnambool City. Appendix Table B-1 shows the country of both as of the 2006 census and the percentage change from 2001 census.

Another approach to understanding migration is to look at the change in place of usual residence 1 year ago as outlined in Appendix Table B-2. Appendix Table B-2 shows that while more residents have remained at the same usual address 1 year ago as of the 2006 census:

- For Southern Grampians Shire, there has been an decrease in residents moving homes (within the same SLA, from a different SLA or overseas);
- For Moyne Shire, there has been an increase in residents moving homes (within the same SLA) and an increase in residents having moved from overseas;
- For Glenelg Shire, there has been an overall decrease in residents moving homes within Australia, but an increase in residents having moved from overseas; and
- For Warrnambool City, there has been an overall increase in residents moving homes (within the same SLA, from a different SLA, or overseas.

[52] Australian Bureau of Statistics, (2003), *Cat. No. 2005 Community Profile Series based on place of enumeration.*

[53] Australian Bureau of Statistics, (2007), *Cat. No. 2005 Community Profile Series based on place of usual residence.*



- Appendix Table B-1 Country of Birth as of the 2006 census and percentage change from 2001 census[54,55]

| Region | Australia | | Germany | | Netherlands | | New Zealand | | United Kingdom | | All other countries | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 |
| Southern Grampians | 14,837 | -1% | 35 | 9% | 77 | 0% | 223 | 87% | 398 | -5% | 983 | 399% |
| Moyne | 13,672 | -1% | 21 | 11% | 76 | 33% | 257 | 38% | 359 | -9% | 1,020 | 736% |
| Glenelg | 17,233 | -0.3% | 54 | 14.9% | 126 | 8.6% | 184 | -7.5% | 590 | -0.3% | 307 | -10.0% |
| Warrnambool | 26,732 | 5.2% | 49 | -2.0% | 106 | -11.7% | 242 | 27.4% | 716 | -2.6% | 430 | -3.8% |
| Bal. of Victoria | 1,124,360 | 4% | 6,897 | 0% | 8,223 | 1% | 11,365 | 19% | 48,025 | 1% | 119,977 | 201% |

- Appendix Table B-2 Place of usual residence 1 year ago as of 2006 census and percentage change from 2001 census[56,57]

| Region | Same usual address 1 year ago | | Different usual address 1 year ago | | | | | | | | Not stated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Same SLA | | Different SLA | | Overseas | | Not stated | | | |
| | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 |
| Southern Grampians | 13,894 | 6% | 864 | -9% | 1,126 | -3% | 64 | -3% | 18 | 6% | 460 | 21% |
| Moyne | 12,834 | 4% | 638 | 10% | 1,054 | -3% | 65 | 81% | 11 | -48% | 650 | 67% |
| Glenelg | 16,165 | 7% | 1,296 | -9% | 1,191 | -5% | 68 | 13% | 30 | 0% | 798 | 42% |
| Warrnambool | 23,388 | 10% | 3,102 | 9% | 1,876 | 7% | 128 | 22% | 19 | -10% | 1,513 | 48% |
| Bal. of Victoria | 1,072,810 | n/a | 80,085 | n/a | 96,444 | n/a | 6,498 | n/a | 1,779 | n/a | 59,825 | n/a |

[54] Australian Bureau of Statistics, (2003), *Cat. No. 2004 Community Profile Series based on place of usual residence.*

[55] Australian Bureau of Statistics, (2007), *Cat. No. 2001 Community Profile Series based on place of usual residence.*

[56] Australian Bureau of Statistics, (2003), *Cat. No. 2004 Community Profile Series based on place of usual residence.*

[57] Australian Bureau of Statistics, (2007), *Cat. No. 2001 Community Profile Series based on place of usual residence.*



## Educational attainment

Southern Grampians Shire, Moyne Shire, Glenelg Shire, and Warrnambool City have all experienced a growth across all types of non-school qualification where the number of residents having obtained a post graduate degree, graduate diploma and graduate certification, bachelor degree, advanced diploma and diploma degree and certificate has increased from 2001 census to 2006 census.

Similarly the number of residents the balance of Victoria having obtained a non-school qualification have also increased from 2001 census to 2006 census.

- Appendix Table B-3 Non-school qualifications as of the 2006 census and percentage change from 2001 census[58,59]

| Region | Postgraduate Degree | | Graduate Diploma & Graduate Certificate | | Bachelor Degree | | Advanced Diploma & Diploma | | Certificate | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 | 2006 | % chg from 2001 |
| Southern Grampians | 135 | 36% | 181 | 21% | 1,042 | 30% | 872 | 15% | 2,369 | 18% |
| Moyne | 112 | 33% | 146 | 2% | 879 | 24% | 745 | 18% | 2,121 | 20% |
| Glenelg | 84 | 58% | 180 | 55% | 911 | 15% | 773 | 25% | 2909 | 18% |
| Warrnambool | 281 | 34% | 385 | 24% | 2108 | 22% | 1515 | 32% | 4375 | 25% |
| Bal. of Victoria | 12,055 | 53% | 15,931 | 17% | 83,430 | 24% | 66,002 | 29% | 197,285 | 21% |

## Industries of employment

Appendix Table B-4 and B-5 provides the business count data by turnover. All shires exhibit similar characteristics where 82% (Southern Grampians Shire), 79% (Moyne Shire), 86% (Glenelg) and 77% (Warrnambool City) have an annual turnover of $500,000 or less.

[58] Australian Bureau of Statistics, (2003), *Cat. No. 2004 Community Profile Series based on place of usual residence.*

[59] Australian Bureau of Statistics, (2007), *Cat. No. 2001 Community Profile Series based on place of usual residence.*



- Appendix Table B-4 Turnover by Industry 2011 for Southern Grampians Shire (top) and Moyne Shire (bottom)[60]

| Industry | Zero to $50k | $50k to $100k | $100k to $200K | $200k to $500k | $500k to $2m | $2m or more | Total | % total |
|---|---|---|---|---|---|---|---|---|
| Agriculture, Forestry and Fishing | 173 | 95 | 162 | 231 | 133 | 12 | 806 | 71% |
| Mining | | | | | | | 0 | 0% |
| Manufacturing | 3 | | 3 | 3 | 3 | | 12 | 1% |
| Electricity, Gas, Water and Waste Services | | | | | | | 0 | 0% |
| Construction | 13 | 10 | 10 | 16 | 9 | 3 | 61 | 5% |
| Wholesale Trade | 3 | 3 | 3 | 3 | 6 | | 18 | 2% |
| Retail Trade | 4 | 3 | 3 | 5 | 9 | 3 | 27 | 2% |
| Accommodation and Food Services | 3 | | 10 | 6 | 6 | | 25 | 2% |
| Transport, Postal and Warehousing | 8 | 8 | 7 | 6 | 7 | 3 | 39 | 3% |
| Information Media and Telecommunications | | | | | | | 0 | 0% |
| Financial and Insurance Services | 6 | 3 | 6 | 3 | | | 18 | 2% |
| Rental, Hiring and Real Estate Services | 11 | 10 | 12 | 9 | | | 42 | 4% |
| Professional, Scientific and Technical Services | 14 | 3 | 6 | 3 | | | 26 | 2% |
| Administrative and Support Services | 5 | 3 | 6 | 6 | | | 20 | 2% |
| Public Administration and Safety | | | | | | | 0 | 0% |
| Education and Training | | | 3 | | | | 3 | 0% |
| Health Care and Social Assistance | 3 | | | 3 | | 3 | 9 | 1% |
| Arts and Recreation Services | 3 | | | | | | 3 | 0% |
| Other Services | 3 | | | 9 | 3 | | 15 | 1% |
| Total | 255 | 141 | 231 | 303 | 176 | 24 | 1,130 | 100% |

| Industry | Zero to $50k | $50k to $100k | $100k to $200K | $200k to $500k | $500k to $2m | $2m or more | Total | % total |
|---|---|---|---|---|---|---|---|---|
| Agriculture, Forestry and Fishing | 234 | 178 | 243 | 314 | 260 | 32 | 1,261 | 57% |
| Mining | 3 | | 3 | 3 | | | 9 | 0% |
| Manufacturing | 12 | 6 | 11 | 15 | 9 | | 53 | 2% |
| Electricity, Gas, Water and Waste Services | 3 | | 3 | | | | 6 | 0% |
| Construction | 39 | 47 | 52 | 38 | 37 | 12 | 225 | 10% |
| Wholesale Trade | 11 | 3 | 7 | 6 | 6 | 3 | 36 | 2% |
| Retail Trade | 22 | 9 | 12 | 26 | 16 | 12 | 97 | 4% |
| Accommodation and Food Services | 7 | 7 | 13 | 23 | 19 | | 69 | 3% |
| Transport, Postal and Warehousing | 16 | 14 | 16 | 16 | 11 | 3 | 76 | 3% |
| Information Media and Telecommunications | 4 | | | 3 | | | 7 | 0% |
| Financial and Insurance Services | 23 | 10 | 10 | 6 | 3 | | 52 | 2% |
| Rental, Hiring and Real Estate Services | 39 | 33 | 20 | 21 | 9 | | 122 | 6% |
| Professional, Scientific and Technical Services | 20 | 12 | 16 | | 3 | | 51 | 2% |
| Administrative and Support Services | 3 | 6 | 3 | | | 3 | 15 | 1% |
| Public Administration and Safety | 3 | | 3 | | | | 6 | 0% |
| Education and Training | 11 | | 3 | 3 | 3 | | 20 | 1% |
| Health Care and Social Assistance | | 7 | 6 | 6 | 3 | | 22 | 1% |
| Arts and Recreation Services | 5 | 3 | 6 | | 9 | | 23 | 1% |
| Other Services | 12 | 12 | 6 | 9 | | | 39 | 2% |
| Total | 472 | 359 | 433 | 495 | 392 | 65 | 2,216 | 100% |

[60] Australian Bureau of Statistics, (2012) Cat No. 8165.0 *Counts of Australian Businesses, including Entries and Exists, Jun 2007 to Jun 2011*



- Appendix Table B-5 Turnover by Industry 2011 for Glenelg Shire 2011(top) and City of Warrnambool (bottom)[61]

| Industry | Zero to $50k | $50k to $100k | $100k to $200K | $200k to $500k | $500k to $2m | $2m or more | Total | % total |
|---|---|---|---|---|---|---|---|---|
| Agriculture, Forestry and Fishing | 229 | 129 | 150 | 167 | 99 | 12 | 786 | 62% |
| Mining | | | | | | | | 0% |
| Manufacturing | 4 | 3 | | 6 | 5 | | 18 | 1% |
| Electricity, Gas, Water and Waste Services | 3 | 3 | | | | | 6 | 0% |
| Construction | 21 | 23 | 22 | 32 | 11 | | 109 | 9% |
| Wholesale Trade | 3 | | 9 | 3 | 3 | 3 | 21 | 2% |
| Retail Trade | 14 | 11 | 5 | 3 | 8 | 3 | 44 | 3% |
| Accommodation and Food Services | 7 | 6 | 6 | 3 | 5 | | 27 | 2% |
| Transport, Postal and Warehousing | 9 | 10 | 18 | 10 | 7 | 3 | 57 | 5% |
| Information Media and Telecommunications | | | | | | | | 0% |
| Financial and Insurance Services | 20 | 3 | 5 | | | | 28 | 2% |
| Rental, Hiring and Real Estate Services | 38 | 10 | 8 | 3 | 3 | | 62 | 5% |
| Professional, Scientific and Technical Services | 17 | 5 | 8 | 6 | | | 36 | 3% |
| Administrative and Support Services | 4 | 3 | 3 | | 3 | | 13 | 1% |
| Public Administration and Safety | | | | 3 | | | 3 | 0% |
| Education and Training | 3 | | | | | | 3 | 0% |
| Health Care and Social Assistance | 3 | 3 | 3 | 3 | | | 12 | 1% |
| Arts and Recreation Services | 6 | | | | | | 6 | 0% |
| Other Services | 7 | 5 | 4 | 3 | 3 | | 22 | 2% |
| Total | 394 | 217 | 241 | 242 | 150 | 21 | 1,265 | 100% |

| Industry | Zero to $50k | $50k to $100k | $100k to $200K | $200k to $500k | $500k to $2m | $2m or more | Total | % total |
|---|---|---|---|---|---|---|---|---|
| Agriculture, Forestry and Fishing | 101 | 51 | 43 | 61 | 47 | 19 | 322 | 11% |
| Mining | | | | | | 3 | 3 | 0% |
| Manufacturing | 36 | 16 | 21 | 19 | 21 | 15 | 128 | 4% |
| Electricity, Gas, Water and Waste Services | | | | | 3 | | 3 | 0% |
| Construction | 72 | 114 | 108 | 115 | 89 | 23 | 521 | 18% |
| Wholesale Trade | 11 | | 8 | 10 | 20 | 27 | 76 | 3% |
| Retail Trade | 34 | 12 | 24 | 57 | 76 | 41 | 244 | 8% |
| Accommodation and Food Services | 14 | 14 | 19 | 60 | 51 | 10 | 168 | 6% |
| Transport, Postal and Warehousing | 37 | 22 | 21 | 28 | 17 | 11 | 136 | 5% |
| Information Media and Telecommunications | 3 | 3 | | | | | 6 | 0% |
| Financial and Insurance Services | 86 | 37 | 36 | 30 | 18 | 3 | 210 | 7% |
| Rental, Hiring and Real Estate Services | 93 | 66 | 46 | 41 | 26 | 6 | 278 | 10% |
| Professional, Scientific and Technical Services | 50 | 29 | 27 | 24 | 29 | 13 | 172 | 6% |
| Administrative and Support Services | 21 | 12 | 12 | 24 | 6 | 3 | 78 | 3% |
| Public Administration and Safety | 3 | | | | 6 | | 9 | 0% |
| Education and Training | 6 | 6 | 9 | 6 | 6 | 3 | 36 | 1% |
| Health Care and Social Assistance | 33 | 17 | 32 | 40 | 33 | 9 | 164 | 6% |
| Arts and Recreation Services | 10 | 6 | 12 | 6 | 6 | | 40 | 1% |
| Other Services | 16 | 27 | 22 | 32 | 24 | | 121 | 4% |
| Total | 637 | 608 | 440 | 559 | 478 | 186 | 2,908 | 100% |

[61] Australian Bureau of Statistics, (2012) Cat No. 8165.0 *Counts of Australian Businesses, including Entries and Exists, Jun 2007 to Jun 2011*



## Welfare and Disadvantage

Reflecting the aging population, Appendix Table B-6 shows that the number of residents on age pension has increased across all areas. The number of residents on disability support pension has remained constant or increased across all Shires.

- Appendix Table B-6 Number of residents on welfare as of 2006 estimates and % change from 2004 estimates[62]

| Region | Age Pension - Centrelink | | Disability Support Pension | | Parenting Payment - Single | | Youth Allowances | |
|---|---|---|---|---|---|---|---|---|
| | 2010 | % chg from 2006 | 2010 | % chg from 2006 | 2010 | % chg from 2006 | 2010 | % chg from 2006 |
| Moyne | 1,527 | 10% | 512 | 0% | 208 | -26% | 316 | 10% |
| Southern Grampians | 2,198 | 12% | 680 | 19% | 206 | -26% | 319 | -7% |
| Glenelg | 2,500 | 8% | 969 | 20% | 352 | -24% | 405 | 9% |
| Warrnambool | 3,726 | 12% | 1,334 | 11% | 629 | -15% | 846 | 9% |

## SEIFA

Appendix Table B-7 summarises the Socio-Economic Indexes for Areas (SEIFA) scores as of the 2006 census and 2001 census. SEIFA is a suite of four summary measures and the scores for each Census Collection District (CD), Postal Area (POA), Statistical Local Area (SLA) and Local Government Area (LGA) are derived from census data. The four indexes are:

- **Index of Relative Socio-economic Disadvantage:** using indicators of low socio-economic wellbeing, provides a general measure of disadvantage.
- **Index of Relative Socio-economic Advantage and Disadvantage:** extends the above measure to encompass the entire socio-economic spectrum.
- **Index of Economic Resources:** focuses on financial aspects of relative advantage and disadvantage.
- **Index of Education and Occupation:** focuses on the educational and occupational aspects of socio-economic status.

The indexes reflect the relative advantage or disadvantage of areas and may be used for comparative purposes. The lower the score, the more disadvantaged an area is, however the scores do not reflect the size of the difference in socio-economic levels between areas and cannot be used as a comparative tool between years.

The 2001 census shows Melbourne is the most advantaged area across all indexes. Based on the index of relative socio-economic advantage and disadvantage alone, Southern

[62] Australian Bureau of Statistics, (2011), *National Regional Profile.*



Grampians Shire is more advantaged than Moyne Shire, Glenelg Shire and Warrnambool City.

However the 2006 census shows that Southern Grampians Shire is generally more advantaged than Melbourne and the other areas, scoring higher across all indexes except for the index of education and occupation.

- Appendix Table B-7 SEIFA scores as of 2006 census and change from 2001 census[63]

| Region | Index of Relative Socio-economic Disadvantage | | Index of Relative Socio-economic Advantage and Disadvantage | | Index of Economic Resources | | Index of Education and Occupation | |
|---|---|---|---|---|---|---|---|---|
| | 2006 | 2001 | 2006 | 2001 | 2006 | 2001 | 2006 | 2001 |
| Southern Grampians | 1088 | 1030 | 1130 | 963 | 1048 | 928 | 1171 | 979 |
| Moyne | 996 | 1032 | 954 | 960 | 982 | 943 | 978 | 966 |
| Glenelg | 927 | 981 | 962 | 934 | 965 | 938 | 924 | 924 |
| Warrnambool | 966 | 1005 | 993 | 968 | 973 | 955 | 961 | 979 |
| Melbourne | 1049 | 1038 | 1120 | 1145 | 962 | 1115 | 1190 | 1179 |

[63] Australian Bureau of Statistics, (2007), Socio-economic Indexes for Areas



# Appendix C: Questionnaire for Macarthur wind farm

**Economic Impact Assessment of Macarthur and Oaklands Hill wind farms on the South Western Region of Victoria**

This questionnaire relates to **Macarthur wind farm** only

Please fill out the parts of the questionnaire that are relevant to your organisation as accurately as possible. The information required includes:

- Total expenditure by phase by your organisation
- A broad percentage breakdown of the location of this expenditure based on the geographic location of the supplier
- More detailed spending in the South Western Region of Victoria
- Additional information related to employment

We understand the following dates are applicable. Please base your responses on these dates.

| Phase | Development | Construction | Construction | Operation |
|---|---|---|---|---|
| Type | Actual | Actual to date | Estimate to completion | Estimate |
| Macarthur wind farm | Before mid November 2010 | Mid November 2010 to mid August 2012 | Mid August 2012 to project completion (expected completion: first quarter of 2013) | From project completion to 12 months after project completion |

**Basic Information**

| | |
|---|---|
| Name of organisation | |
| Name of person filling out this questionnaire | |
| Name of person in charge of providing this data to SKM | |
| Date submitted | |
| Brief description of your organisation's role to this project | |
| Who did you invoice for your work on this project? | |
| Did any sub-contractors/sub-consultants invoice your organisation for this project? If so, please name the major sub-contractors/sub-consultants | |

**Total expenditure by phase by your organisation**

Q1: Total expenditure by your organisation during the development, construction (actual to date and estimate to completion) and operation phases? Please quote in thousands (AUD $'000).

| Phase | Development | Construction | Construction | Operation |
|---|---|---|---|---|
| Type | Actual | Actual to date | Please provide an estimate to completion | Please provide an estimate for 12 months of operations |
| Macarthur wind farm | | | | |
| Please note the inclusions | | | | |
| Please note the exclusions | | | | |

| Further Information (if relevant): |
|---|
| |
| |
| |
| |
| |

**Broad percentage breakdown of this expenditure by location**
Q2: Estimated percentage of expenditure from Q1 above made in each of the geographic areas noted in the table below.

| | South Western Region of Victoria | Remainder of Victoria | Rest of Australia | Overseas | Total |
|---|---|---|---|---|---|
| Development | | | | | 100% |
| Construction (actual to date) | | | | | 100% |
| Construction (estimate to completion) | | | | | 100% |
| Operations (estimate for 12 months of operations) | | | | | 100% |

| Further Information: ( Please note major items of expenditure in each location) |
|---|
| |
| |
| |
| |

**More detailed expenditure for the South Western Region of Victoria**
Q3: Estimate of actual money spent in the Region during the **development phase** for Macarthur wind farm (by accommodation, charges etc). Please quote in thousands (AUD $'000).
Q4: Estimated percentage of expenditure from Q3 made in each of the geographic areas noted in the table below.

| | AUD $'000 | Estimated percentage made in each of the geographical areas | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total for Region | Macarthur | Port Fairy | Warrnambool | Portland | Hamilton | Others in Region | Total in Region |
| Accommodation, meals and other incidental spending | | | | | | | | 100% |
| Council and other regulatory fees and charges | | | | | | | | 100% |
| Community funds or sponsorship | | | | | | | | 100% |
| Services e.g. wind monitoring, geotechnical investigations | | | | | | | | 100% |
| Landowner payments | | | | | | | | 100% |
| Others | | | | | | | | 100% |



| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Total | | n/a | n/a | n/a | n/a | n/a | n/a | n/a |

| Further Information: |
|---|
| |
| |
| |
| |

Q5: Estimate of actual money spent in the Region during the **construction phase (actual to date)** for Macarthur wind farm (by accommodation, charges etc). Please quote in thousands (AUD $'000).
Q6: Estimated percentage of expenditure from Q5 made in each of the geographic areas noted in the table below.

| | AUD $'000 | Estimated percentage made in each of the geographical areas | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total for Region | Macarthur | Port Fairy | Warrnambool | Portland | Hamilton | Others in Region | Total in Region |
| Accommodation, meals and other incidental spending | | | | | | | | 100% |
| Council and other regulatory fees and charges | | | | | | | | 100% |
| Community funds or sponsorship | | | | | | | | 100% |
| Services e.g. wind monitoring, geotechnical investigations | | | | | | | | 100% |
| Landowner payments | | | | | | | | 100% |
| Others | | | | | | | | 100% |
| Total | | n/a | n/a | n/a | n/a | n/a | n/a | n/a |

| Further Information: |
|---|
| |
| |
| |
| |

Q7: Estimate of money to be spent in the Region during the **construction phase (estimate to completion)** for Macarthur wind farm (by accommodation, charges etc). Please quote in thousands (AUD $'000).
Q8: Estimated percentage of expenditure from Q7 made in each of the geographic areas noted in the table below.

| | AUD $'000 | Estimated percentage made in each of the geographical areas | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total for Region | Macarthur | Port Fairy | Warrnambool | Portland | Hamilton | Others in Region | Total in Region |
| Accommodation, meals and other incidental spending | | | | | | | | 100% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Council and other regulatory fees and charges | | | | | | | | 100% |
| Community funds or sponsorship | | | | | | | | 100% |
| Services e.g. wind monitoring, geotechnical investigations | | | | | | | | 100% |
| Landowner payments | | | | | | | | 100% |
| Others | | | | | | | | 100% |
| Total | | n/a | n/a | n/a | n/a | n/a | n/a | n/a |

| Further Information: |
|---|
| |
| |
| |
| |

Q9: Estimate of money to be spent in the Region during the **operations phase (estimate for 12 months of operations)** for Macarthur wind farm (by accommodation, charges etc). Please quote in thousands (AUD $'000).
Q10: Estimated percentage of expenditure from Q9 made in each of the geographic areas noted in the table below.

| | AUD $'000 | Estimated percentage made in each of the geographical areas | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total for Region | Macarthur | Port Fairy | Warrnambool | Portland | Hamilton | Others in Region | Total in Region |
| Accommodation, meals and other incidental spending | | | | | | | | 100% |
| Council and other regulatory fees and charges | | | | | | | | 100% |
| Community funds or sponsorship | | | | | | | | 100% |
| Services e.g. wind monitoring, geotechnical investigations | | | | | | | | 100% |
| Landowner payments | | | | | | | | 100% |
| Others | | | | | | | | 100% |
| Total | | n/a | n/a | n/a | n/a | n/a | n/a | n/a |

| Further Information: |
|---|
| |
| |
| |
| |



**Additional information related to employment**

Q11: Actual and estimated employment by phase.

Q12: Estimated percentage of total staff from Q11 above who are part-time

| | Development | | Construction (actual to date) | | Construction (estimate to completion) | | Operations (estimate for first 12 months of operations) | |
|---|---|---|---|---|---|---|---|---|
| Employment | Average | Peak | Average | Peak | Average | Peak | Average | Peak |
| Total number of staff | | | | | | | | |
| Estimated percentage of total staff who are part-time | | | | | | | | |

| Further Information: (Please indicate approximate date of Peak employment by phase.) |
|---|
| |
| |
| |
| |

Q13: What type of accommodation was used by employees located on site or at other locations in the Region during **construction phase** by proportion (%) of employees and reasons for choice?

| Item | Proportion | Reason for choice |
|---|---|---|
| Own home | | |
| Private rental | | |
| Hotel/Motel | | |
| Caravan Park | | |
| Construction Camp | | |
| Other please specify: | | |
| Total | 100% | n/a |

Q14: Please note any employment policies/practices

| Policies/practices | Yes or No | Please expand if relevant |
|---|---|---|
| a) Encourage recruitment of locals | | |
| b) Encourage use of local/Regional contractors subject to meeting competitive requirements | | |
| c) Established numbers of O&M personnel for given numbers of Turbines e.g. 1 operative per 7 turbines | | |
| d) Establishment of/support for skills creation programs | | |
| e) Specific targeted recruitment including indigenous employment programs, employment of young people etc. | | |
| f) Other please specify: | | |



# Appendix D: Questionnaire for Oaklands Hill wind farm

**Economic Impact Assessment of Macarthur and Oaklands Hill wind farms on the South Western Region of Victoria**

This questionnaire relates to **Oaklands Hill wind farm** only

Please fill out the parts of the questionnaire that are relevant to your organisation as accurately as possible. The information required includes:

- Total expenditure by phase by your organisation
- A broad percentage breakdown of the location of this expenditure based on the geographic location of the supplier
- More detailed spending in the South Western Region of Victoria
- Additional information related to employment

We understand the following dates are applicable. Please base your responses on these dates.

| Phase | Development | Construction | Operation |
|---|---|---|---|
| Oaklands Hill wind farm | Before May 2010 | From May 2010 to August 2011 | August 2011 to 19 August 2012 |

**Basic Information**

| | |
|---|---|
| Name of organisation | |
| Name of person filling out this questionnaire | |
| Name of person in charge of providing this data to SKM | |
| Date submitted | |
| Brief description of your organisation's role to this project | |
| Who did you invoice for your work on this project? | |
| Did any sub-contractors/sub-consultants invoice your organisation for this project? If so, please name the major sub-contractors/sub-consultants | |

**Total expenditure by phase by your organisation**

Q1: Total expenditure by your organisation during the development, construction and operation phases? Please quote in thousands (AUD $'000).

| Phase | Development | Construction | Operation |
|---|---|---|---|
| Oaklands Hill wind farm | | | |
| Please note the inclusions | | | |
| Please note the exclusions | | | |

| Further Information (if relevant): |
|---|
| |
| |
| |
| |

**Broad percentage breakdown of this expenditure by location**

Q2: Estimated percentage of expenditure from Q1 above made in each of the geographic areas noted in the table below.

| | South Western Region of Victoria | Remainder of Victoria | Rest of Australia | Overseas | Total |
|---|---|---|---|---|---|
| Development | | | | | 100% |
| Construction | | | | | 100% |
| Operations | | | | | 100% |

| Further Information: ( Please note major items of expenditure in each location) |
|---|
| |
| |
| |
| |

**More detailed expenditure for the South Western Region of Victoria**

Q3: Estimate of actual money spent in the Region during the **development phase** for Oaklands Hill wind farm (by accommodation, charges etc). Please quote in thousands (AUD $'000).

Q4: Estimated percentage of expenditure from Q3 made in each of the geographic areas noted in the table below.

| | AUD $'000 | Estimated percentage made in each of the geographical areas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total for Region | Glenthompson | Dunkeld | Port Fairy | Warrnambool | Portland | Hamilton | Others in Region | Total in Region |
| Accommodation, meals and other incidental spending | | | | | | | | | 100% |
| Council and other regulatory fees and charges | | | | | | | | | 100% |
| Community funds or sponsorship | | | | | | | | | 100% |
| Services e.g. wind monitoring, geotechnical investigations | | | | | | | | | 100% |
| Landowner payments | | | | | | | | | 100% |
| Others | | | | | | | | | 100% |
| Total | | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |

| Further Information: |
|---|
| |
| |
| |
| |

Q5: Estimate of actual money spent in the Region during the **construction phase** for Oaklands Hill wind farm (by accommodation, charges etc). Please quote in thousands (AUD $'000).
Q6: Estimated percentage of expenditure from Q5 made in each of the geographic areas noted in the table below.

| | AUD $'000 | Estimated percentage made in each of the geographical areas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total for Region | Glenthompson | Dunkeld | Port Fairy | Warrnambool | Portland | Hamilton | Others in Region | Total in Region |
| Accommodation, meals and other incidental spending | | | | | | | | | 100% |
| Council and other regulatory fees and charges | | | | | | | | | 100% |
| Community funds or sponsorship | | | | | | | | | 100% |
| Services e.g. wind monitoring, geotechnical investigations | | | | | | | | | 100% |
| Landowner payments | | | | | | | | | 100% |
| Others | | | | | | | | | 100% |
| Total | | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |

| Further Information: |
|---|
| |
| |
| |
| |

Q7: Estimate of actual money spent in the Region during the **operation phase** for Oaklands Hill wind farm (by accommodation, charges etc). Please quote in thousands (AUD $'000).
Q8: Estimated percentage of expenditure from Q7 made in each of the geographic areas noted in the table below.

| | AUD $'000 | Estimated percentage made in each of the geographical areas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total for Region | Glenthompson | Dunkeld | Port Fairy | Warrnambool | Portland | Hamilton | Others in Region | Total in Region |
| Accommodation, meals and other incidental spending | | | | | | | | | 100% |
| Council and other regulatory fees and | | | | | | | | | 100% |



| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| charges | | | | | | | | | |
| Community funds or sponsorship | | | | | | | | | 100% |
| Services e.g. wind monitoring, geotechnical investigations | | | | | | | | | 100% |
| Landowner payments | | | | | | | | | 100% |
| Others | | | | | | | | | 100% |
| Total | | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |

| Further Information: |
|---|
| |
| |
| |
| |

**Additional information related to employment**

Q9: Actual employment by phase.

Q10: Estimated percentage of total staff from Q9 above who are part-time

| | Development | | Construction | | Operations | |
|---|---|---|---|---|---|---|
| Employment | Average | Peak | Average | Peak | Average | Peak |
| Total number of staff | | | | | | |
| Estimated percentage of total staff who are part-time | | | | | | |

| Further Information: (Please indicate approximate date of Peak employment by phase.) |
|---|
| |
| |
| |
| |

Q11: What type of accommodation was used by employees located on site or at other locations in the Region during **construction phase** by proportion (%) of employees and reasons for choice?

| Item | Proportion | Reason for choice |
|---|---|---|
| Own home | | |
| Private rental | | |
| Hotel/Motel | | |
| Caravan Park | | |
| Construction Camp | | |
| Other please specify: | | |
| Total | 100% | n/a |

Q12: Please note any employment policies/practices

| Policies/practices | Yes or No | Please expand if relevant |
|---|---|---|
| g) Encourage recruitment of locals | | |
| h) Encourage use of local/Regional contractors subject to meeting competitive requirements | | |
| i) Established numbers of O&M personnel for given numbers of Turbines e.g. 1 operative per 7 turbines | | |
| j) Establishment of/support for skills creation programs | | |

| | | | |
|---|---|---|---|
| k) | Specific targeted recruitment including indigenous employment programs, employment of young people etc. | | |
| l) | Other please specify: | | |

# Appendix E: Staff expenditure survey

# Macarthur Wind Farm Staff Expenditure Survey

Thank you for agreeing to complete this survey. It should take less than 5 minutes to complete.

Your answers will be confidential. The results will be presented in aggregate and so no individual's responses will be identifiable.

The results of this survey will be used, along with other information, to show how the Macarthur Wind Farm Project has contributed to the local and regional economies.

---

1. What is your **home** post code / suburb / town?

_____

2. What is the post code / suburb / town where you live while working on this project (if different from above)?

_____

3. How long have you been employed on the Macarthur Wind Farm Project so far?

Less than 1 month ☐
1 – 3 months ☐
3 – 6 months ☐
6 – 12 months ☐
Over 12 months ☐

4. How long do you expect to be employed on the Macarthur Wind Farm Project in the future?

Less than 1 month ☐
1 – 3 months ☐
3 – 6 months ☐
6 – 12 months ☐
Until completion ☐

5. Do you mainly work in the field or in an office?

Field ☐
Office ☐
About equally field and office ☐

6. Which age category do you fit into?

Under 20 years ☐
21-30 Years ☐
31- 40 years ☐
41- 50 years ☐
50 plus years ☐

7. Are you male or female?

Male ☐
Female ☐

8. What is your section within the alliance?

Construction ☐
Design ☐
Project ☐
Service ☐
Commercial ☐
Stakeholder ☐
HR ☐

9. Did you regularly spend money in the **region** (defined as Macarthur, Port Fairy, Warrnambool, Portland, Hamilton and nearby towns) prior to working on this job?

Yes ☐ → please only list new spending in the questions below
No ☐ → please list all spending in the questions below

In the table below, please provide details of the amount of money spent in the **REGION**, in the last week. If you are unsure of the exact amount, please provide us with an approximate figure. If you didn't spend any money on that particular item, then please leave it blank.

10. How much did you spend in **THE REGION** in the **LAST WEEK**?
**REGION** is defined as Macarthur, Port Fairy, Warrnambool, Portland, Hamilton and nearby towns

| | **Total amount spent last week** |
|---|---|
| Food e.g. Breakfast, morning tea, lunch | |
| Newspaper/magazine/stationary | |
| Drinks | |
| Fuel | |
| Tools | |
| Services e.g. dry cleaning | |
| Accommodation | |
| Other food e.g. groceries | |
| Other (please specify) ..... | |

Q11. For the total amount spent (answer from Q10) please estimate the **PERCENTAGE** breakdown by the towns listed below. If you have spent money in other towns that are **NOT LISTED**, please list them in the space provided and the percentage breakdown.

| Towns | **Percentage of total amount spent in the last week** |
|---|---|
| Macarthur | |
| Port Fairy | |
| Warrnambool | |
| Portland | |
| Hamilton | |
| Other (please list): | |
| Other (please list): | |
| Other (please list): | |
| Other (please list): | |
| | 100% |

Q12. As a result of working on the project, have you got involved in any new community activities in the region?

Yes ☐ - if yes, please provide details in the next questions.

No ☐ - if no, please skip the next question.

Please indicate which activities you have undertaken:

☐ Joined a gym or pool
☐ Joined a church
☐ Joined a sporting club
☐ Joined a community or environmental group
☐ Joined CFA/SES
☐ Joined a service club (eg Rotary)

Other (please specify):

_____

_____

You have now completed the survey.

Thank you very much for taking the time to complete it. Your help is greatly appreciated.

Have a great day!



# Appendix F: Detailed Input-Output Methodology

The method used by SKM to derive state and sub-state level IO tables and associated impact multipliers for the Oaklands Hill and Macarthur Wind Farms Impact Analysis is similar to the Distributive Commodity Balance (DCB) Method, which has been used at the University of Western Australia[64] and the University of Western Sydney[65]. Likewise, the DCB method has been adapted from the Generation of Regional Input-Output Tables (GRIT) methodology developed at the University of Queensland.

SKM has adapted the DCB methodology, utilising a specially designed and streamlined hybrid methodology that incorporates the latest advances in disaggregation using location quotients and effective full-time employment to more accurately reflect industrial employment characteristics, the volume of economic activity, and industrial specialisation.

## F.1 Use of location quotients in disaggregation

Location quotients are indicators of characteristic differences between a reference area or group and a subset of that area or group. At their core, location quotients can be considered to be a measure of dispersion or more simply, a ratio of specialisation of a particular characteristic of the study region to the reference population.

Location quotients have been used extensively in regional economic analysis and are used to apportion, or disaggregate data from large regions down to smaller areas of interest. SKM has used the 2008-2009 IO Tables for Australia developed by the Australian Bureau of Statistics to first create a state IO table for Victoria, and then in-turn transform this table to model the economy of the region[66]. Prior to development, the 2008-2009 IO Tables for Australia were updated using biproporational update techniques and the 2010-2011 Australian National Accounts to provide a recent, up-to-date picture of the Australian, state, and regional economies.

The location quotients used by SKM indicate a share of employment that an industry has study area in relation to the share of employment within the same industry of the reference region. A location quotient greater than one indicates that the industry within the region of interest is more important to that regional economy than the industry is to the economy of the reference region as a whole.

A variety of location quotients exist including the Simple Location Quotients, Cross-Industry Location Quotients, and Flegg-Location Quotients.

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[64] Johnson, Peter L. (2001), An *Input-Output Table for the Kimberly Region of Western Australia*, University of Western Australia.

[65] Christie, J., Varua, Maria E. (2010), *Application of the Distributive Commodity Balance Method Approach to Regional Disaggregation: the Case of Penrith LGA*, University of Western Sydney.

[66] Australian Bureau of Statistics (2011), *Australian National Accounts: Input-Output Tables – Electronic Publication, 2007-2008 Final*, 5209.0.55.001, Australian Government.

### F.1.1 Simple location quotient

National economies typically produce higher proportions of inputs to outputs, attaining higher level of self-sufficiency than state or regional economies. The simple location quotient (SLQ) is an indicator of the degree with which a selected quantitative characteristic, production in this case, is distributed between the State and the national economy and the region and state likewise. It simply compares the relative importance of a sector in a region and its relative importance at a higher level. SLQ can be considered as measure of regional concentration of particular production sector.

The equation takes the form,

SLQ = (ri / r) / (Ri / R)

where ri is the employment within industry i within the region of interest and r is total employment within the region of interest, Ri is the employment within industry i within the reference region, and R is total employment within the reference region. The reference region is assumed to be self sufficient, which in actuality is not always the case.

While the SLQ is generally low-cost and has been employed as an informational tool to describe national, state, and local economies, it is generally recognised as being inappropriate for the purposes of deriving state and sub-State IO tables from the national table due to its tendency to overestimate multipliers and underestimate imports.

### F.1.2 Cross-industry location quotient

Cross-industry location quotients (CILQ) attempt to incorporate differing economic structures between regions based on consuming industries output. It calculates a different quotient for each cell of the IO table to disaggregate, rather than a single location quotient being applied to an entire row of the table as is the case for the SLQ. The CIQ is mathematically expressed as,

CIQij = (xi / Xi) / (ri / Rj) = SLQi / SLQj

where xi is the output of industry i within the region of interest, Xi is the output of industry i within the reference region, rj is the output of industry j (that consumes from industry i) within the region of interest and Rj is the output of industry j within the reference region.

As with the SLQ, the CILQ can be calculated using employment data as a proxy for output. In each cell of the IO table, if the CILQ is greater than or equal to one, then the regional coefficient is set equal to the national coefficient, if the CILQ is less than one, the national coefficient is weighted by the CILQ. But given the diversity between regions across Australia and even more prominent across a single state, a better constructed regional IO table that reflects the characteristics of the region is more useful for regional decision making.

Despite the fact CILQ technique takes into account the selling and purchasing industry, it does not take into account the relative size of the region. This causes regional imports coefficients of a small region to be equal to those of a great region while imports of a small region will be bigger than imports of a greater region and in such case the intraregional

input coefficients are again overestimated. For example, the agricultural sector is far more important to employment (or output) in rural areas than at a national level, which would not be recognised using CILQ. This would most certainly be the case when disaggregating the state level tables to the region – the CILQ does not provide weighting of industries relative to the output of the region.

### F.1.3 Flegg location quotients

To overcome the deficiencies in the SLQ and CILQ, SKM utilised a version of the Flegg Location Quotient (FLQ) that incorporates the latest developments in the field of regional economic analysis. The FLQ does use however, the SLQ and CILQ as a starting point to take into account the relative size of a region and in estimating regional imports taking into account:

- the relative size of the supplying sector,
- the relative size of the purchasing sector, and
- the relative size of the region.

The FLQ is proposed in modified form:

$FLQij = (CILQij)*(\lambda)$

where the parameter λ takes on the form of an incorporated gravity model and is calculated as:

$\lambda = \log2[1 + (Eir / Ein)]^{\delta}$

with both $0 \leq \delta < 1$ and $0 \leq \lambda < 1$

Er and En are employment of a sector in the region and in the nation respectively and δ is the weighting parameter based on the size of the region. The larger the regional size, the greater the regional input coefficients and the smaller the regional import coefficients. Furthermore, an augmented of the FLQ takes into account regional specialisation.

Empirical evidence in studies has shown that location quotient based adjustments using the AFLQ are able to produce estimates of output multipliers in all regions that outperform other top-down, location quotient based methods[67,68].

In case when SLQj > 1and FLQij ≥ 1 the national coefficients are scaled upwards with constraint of FLQij ≤ 1 in order to eliminate overvalued adjustments.

The δ parameter is required in both versions of the FLQ. The larger the value of δ, the greater the adjustment for regional imports, as it is inversely related to regional size.

[67] Bonfiglio, A., Chelli, F. (2007), *Assessing the Behavior of Non-Survey Methods of Constructing Regional Input-Output Tables Through a Monte Carlo Simulation*, University of the Marche.

[68] Common Agricultural Policy Regional Impact – The Rural Development Dimension (2010), *Procedure for the Compilation of Regional SAMs Based on National SAMs and Available Regional Datasets: Dataset and Documentation*, European Commission



Previous studies have shown that a value of δ falls between 0.3 and 0.4, with 0.3 being used by SKM for both Victoria and the region[69,70].

## F.2 Augmented distributive commodity balance

The distributive commodity balance (DCB) method is an iterative approach to the development of regional IO tables. Originally developed using CILQ, the method has been adapted by SKM to use the AFLQ approach. The process allows the incorporation of regional data and is based on based upon an IO table for a larger region, in this case starting with the IO table for Australia. The process implemented by SKM involves 10 steps:

### F.2.1 1: Select and adjust the base table

For the creation of the Victorian IO table, the base table selected is the most recent 111-sector national table for 2007-2008 from the ABS[71] and updated to 2010-2011 by SKM using the latest National Accounts Data from the ABS.

### F.2.2 2: Prepare output data and adjust employment data for EFT

Data is sourced from various ABS and OESR collections that is state and industry specific[72],[73]. The data is sourced for 2010-2011 prices and has been collected in value terms for insertion to the value based Input-Output table. Where output data was not available at the 111 IO table industry classification, it is either manipulated to reflect the same classifications, or employment data is utilised. The employment data is adjusted from the total number of people employed to full time equivalent employment to more accurately depict employment and industrial linkages[74].

### F.2.3 3: Produce preliminary state demand and supply tables

The state share of industrial output as a percentage of national industry output was achieved using AFLQs and where, output data is not available, full-time equivalent employment data is used to calculate the quotients.

### F.2.4 Stage 4: Insert regionally specific data and determine minimum trade

The DCB method allows for another insertion of state specific data in the way of sales and consumption data5[,75]. Data is adjusted to conform with 111 industry classifications and inserted as an override to substitute the original demand and supply elements of the table.

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[69] Bonfiglio, A., Chelli, F. (2007), *Assessing the Behavior of Non-Survey Methods of Constructing Regional Input-Output Tables Through a Monte Carlo Simulation*, University of the Marche.

[70] Common Agricultural Policy Regional Impact – The Rural Development Dimension (2009), *Regionalisation of the Social Accounting Matrix - Methodological Review*, European Commission

[71] Australian Bureau of Statistics (2011), *Australian National Accounts: Input-Output Tables – Electronic Publication, 2007-2008 Final*, 5209.0.55.001, Australian Government.

[72] Office of Economic and Statistical Research (2011), *Queensland Regional Profiles*, Queensland Treasury.

[73] Australian Bureau of Statistics (2011), *Australian National Accounts: National Income, Expenditure and Product*, *Sep 2011*, 5206.0, Australian Government

[74] Christie, J. (2010), *Effective Full Time Employment for Location Quotients*, University of Western Sydney.

[75] Australian Bureau of Statistics (2011), *Australian National Accounts: State Accounts, 2010-2011*, 5220.0, Australian Government.

Minimum tables are then established to show the minimum values at which trade will occur and excess trade amounts are produced for redistribution.

### F.2.5 Stage 5: Redistribute excess supply and demand

Excess supply of a producing industry is calculated, along with the excess demand of the using industry. In cases where there is excess supply from an industry, it is redistributed to meet excess demand. Additional remaining excess supply is allocated for export is and any remaining excess demand allocated to imports of the output.

### F.2.6 Stage 6: Produce preliminary state input-output table

The redistributed values are added to the minimum tables established in stage 4 to produce the preliminary state IO table.

### F.2.7 Stage 7: Insert additional data as table balancing targets

The analyst may decide to provide element targets for the rest of the table to be balanced from. In the case of State table, the relevant State Accounts data is inserted and the table balanced from there[75].

### F.2.8 Stage 8: Apply biproportional balancing to determine the final table

The biproporational balancing technique, also known as the 'RAS' method, is a procedure for balancing supply and demand in the stable so that each industry has the same level of output[76]. Addition of regional data, redistribution of imports and exports, and balancing targets introduce imbalances, and the application of the biproportional procedure redistributes and balances the table by iterative adjustments.

### F.2.9 Stage 9: Produce final table and aggregate

The final state table in its 111-industry format is checked for any industries that furnish zero production, checked for accuracy and amalgamated into a higher 19-industry ANZSIC classification for presentation.

### F.2.10 Stage 10: Producing sub-state tables

The process described above is then repeated, this time using the state table as the foundation table, to furnish sub-State tables.

[76] DeMensard, L., Lahr, M. (2004), *Biproportional Techniques in Input–Output Analysis: Table Updating and Structural Analysis*, Economics Systems Research.