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RES Australia Pty Ltd

Twin Creek Wind Farm Socio-Economic Impact Assessment

Final Report

March 2017

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EXECUTIVE SUMMARY

This socio-economic impact assessment focuses on the effect of the Twin Creek Wind Farm Project on regional incomes and employment associated with the construction and operating phases of the project. This effect arises through the primary expenditure directly associated with the project, and then from further 'rounds' of indirect expenditure that this direct expenditure stimulates as it flows to supplying industries and into incomes and consumption.

The economic modelling for the project has been undertaken using indicative assumptions with respect to labour supply. The commitment of the project developers is that there will be prioritisation of local contractors wherever possible, but the modelling assumes that the wind turbine generators are imported from interstate or overseas, and the major local impact is based on transport and assembly.

From a **State perspective**, economic modelling indicates that the project will generate $209 million of value added (which is a net contribution to Gross State Product[1]) in the State of South Australia over the period of construction and that this would happen over three years (allowing for lagged flow through effects). 1,447 person years[2] of employment in South Australia would be supported – or an average of over 480[3] jobs sustained per year over three years. Once operational the project is estimated to support annually $15.5 million of value added in South Australia, and support directly and indirectly in the order of 105 jobs per year. The impact at the national level would be similar to the state level, unless there are constraints in national labour and capital markets with such constraints likely to be limited in the current macroeconomic environment.

From a **regional perspective**[4], the modelling indicates that the project will generate $64 million of value added (contribution to Gross Regional Product) in the region (Barossa and Lower North) over the period of construction and, again allowing for lagged flow through effects, this would happen over three years. 477 person years of employment would be supported, or an average of 159 jobs sustained per year over three years. Once operational the project is estimated to support annually $6.2 million of value added in the region, and support directly and indirectly (including the multiplier impact) approximately 44 jobs per year.

[1] Value added is the way in which economic activity is measured in the National Accounting system. At the national level this is equivalent to Gross Domestic Product (GDP) and is made up of returns to labour (wages and salary and taxes on labour) and returns to capital (gross operating surplus (or profits plus depreciation and financing costs) and company tax and GST). At the state level, the national accounts call this amount the Gross State Product.
[2] i.e. the number of full time equivalent annual jobs created over the period.
[3] 1,474÷3
[4] Regional in this context is defined as the ABS regions of the Barossa and Lower North.

From a **local perspective**[5], based on the assumptions used (which involve the project drawing labour from both the Goyder and Light areas) the modelling indicates that the project will generate:

- $18 million of value added (contribution to Gross Regional Product) in the LGA of Goyder over the period of construction and, again allowing for lagged flow through effects, this would happen over three years. 130 person years of employment for local residents would be supported, or an average of 43 jobs sustained per year over three years. Once operational the project is estimated to support annually $1.8 million of value added in the region, and support directly and indirectly (including the multiplier impact) approximately 12 jobs per year.

- $20 million of value added (contribution to Gross Regional Product) in the LGA of Light over the period of construction over three years. 146 person years of employment for local residents would be supported, or an average of 49 jobs sustained per year over three years. Once operational the project is estimated to support annually $2.3 million of value added in the region, and support directly and indirectly (including the multiplier impact) approximately 16 jobs per year.

The above economic modelling results are summarised in the following tables:

3 Year Construction Impacts

Contribution to GRP - South Australia	Employment Impact - South Australia	Contribution to GRP - Lower North & Barossa	Employment Impact - Region of Lower North & Barossa	Contribution to GRP - Goyder LGA	Employment Impact - Goyder LGA	Contribution to GRP - Light LGA	Employment Impact - Light LGA
$209.1 million	1447; or 482 per annum	$64.3 million	477; or 159 per annum	$18.3 million	130; or 43 per annum	$20.1 million	146; or 49 per annum

Note – GSP is Gross State Product, GRP is Gross Regional Product, and jobs are in FTE's or person years

Annual Operational Impacts

Contribution to GRP - South Australia	Employment Impact - South Australia	Contribution to GRP - Lower North & Barossa	Employment Impact - Region of Lower North & Barossa	Contribution to GRP - Goyder LGA	Employment Impact - Goyder LGA	Contribution to GRP - Light LGA	Employment Impact - Light LGA
$15.5 million	105 per annum	$6.2 million	44 per annum	$1.8 million	12 per annum	$2.3 million	16 per annum

[5] Local in this context is the LGA's of Goyder and Light.

These outcomes are based on assumed levels of local supply, and where more of the activity can be retained in the region (while acknowledging the specialist nature of the construction itself), the more extensive the degree of regional economic activity.

Wind farms can have other positive and negative socio-economic impacts depending on a variety of factors and the specific communities being impacted by the developments. For example, farmers hosting turbines may receive positive financial benefits while other communities might be subject to visual impacts from windfarm infrastructure with no financial benefits. In addition to employment and income generation, property values and carbon emissions are socio-economic externalities of wind farms..

In relation to property values, many studies[6] by independent organisations around the world have failed to find any correlation between wind turbines and declining property values. Some studies have found positive property value impacts associated with:

- Improved regional amenities and infrastructure including local roads, firefighting access roads, etc.
- Increased regional incomes, jobs and property demand (as assessed above).
- Additional rental income from hosting wind turbine generators.
- Provision of a drought-proofing income streams.
- Provision of post-retirement income for farmers.
- Improved biodiversity via less intensive farm activity.
- Prevention of land subdivision and slowing down the process of productive agricultural land changing to rural residential uses in the short to medium term with the shift caused by the additional income generated from the wind farm providing additional cash streams to underpin agricultural use.
- Erosion control and passive wind protection for stock from sub stations and turbine wind turbine generators structures.

6 For example, the Lawrence Berkeley Study, United States, States http://eetd.lbl.gov/ea/ems/reports/lbnl-2829e.pdf, reported in Wind Energy the Facts, Clean Energy Council, March 2013

There will be localised positive and negative impacts associated with wind farms depending on individual property locations. Some may appreciate faster than market trends due to improved farm incomes from hosting wind turbine generators and improved access to infrastructure. Some may fail to keep pace with market trends due to visual and noise impacts. Potential disruption during wind turbine generator assembly and infrastructure establishment is also noted. However, the evidence supports no overall long term negative impact on property values associated with wind farm developments.

Finally, renewable wind energy generation has significant environmental benefits through **carbon emissions reduction** where it replaces coal or gas generated electricity.

It is assumed that the Twin Creek Wind Farm will have the following operating characteristics:

- Total wind farm capacity of up to 183 megawatts.
- Annual average utilisation rate of 40%[7].
- Total generation of 613 Gigawatt hours (Gwh) per annum.

It is conservatively assumed that when electricity is generated through coal fired stations, it produces 0.8 tonnes of carbon per megawatt hour[8] of electricity generated. So the generation of 613 Gwh per annum through coal generation would produce in the order of 0.491 million tonnes of carbon emissions. At a carbon price of $20 per tonne (historically conservative relative to international trading schemes, and much lower than what is expected in the longer term – but matching current prices[9]), the value of carbon emission savings associated with the Twin Creek Wind Farm is estimated to be $9.8 million per annum or a net present value of $104 million over a 20 year period (discount rate of 7% real).

[7] Defined as the actual output of the project relative to its maximum possible output
[8] Annual carbon emissions from the National Electricity Market fell by over 12 million tonnes (CO2-e) between June 2012 and May 2013. They fell by only around 1.5 million tonnes over the previous twelve-month period. Carbon pollution per megawatt-hour has also fallen: from 0.86 to 0.81 tonnes per unit of output, or a little over 5 per cent. Source: The Climate Institute – www.climateinstitute.org.au
[9] http://www.worldbank.org/en/programs/pricing-carbon cites "Royal DSM has put a so-called internal price on carbon of EUR50 per ton of CO2e. Sijbesma said this will 'future proof' the business by changing the mindset when reviewing large investment decisions". http://calcarbondash.org/ indicates a current price of US$13 per tonne (having fallen somewhat in the last few years)

1 INTRODUCTION

RES Australia Pty Ltd (RES Australia) proposes to develop the Twin Creek Wind Farm within the Mid North area of South Australia. The site of the proposed wind farm is approximately 90km north east of Adelaide and north east of Kapunda. The site is located about 10km northeast of Kapunda, accessed via Twin Creek Road. In addition to employment and income generation, property values and carbon emissions are socio-economic externalities of wind farms.

RES is one of the world's leading independent renewable energy companies, with the expertise to develop, engineer, construct, finance, and operate projects around the globe. RES Australia has been developing renewable energy projects in Australia since 2004.

The proposed wind farm will consist of the following components:

- Up to 51 Wind Turbines Generators (WTG).
- Each WTG has a capacity up to 3.6 Megawatts (MW), with a total installed wind capacity up to 183MW.
- Overall height of turbines would be up to 180 metres at the blade tip, with indicative dimensions of the wind turbine generators being approximately 120 metres and blades approximately 63 metres long.
- Associated hard standing areas and access roads.
- Operations and maintenance building with associated car parking.
- An electrical substation.
- Overhead and underground electrical cable reticulation.
- 275kV overhead transmission line for approximately 15 kilometres from the on-site substation to the existing overhead transmission line adjacent Truro.
- Meteorological masts for measuring wind speed and other climatic conditions.

- Temporary construction facilities including a borrow pit and concrete batching plant facilities.

Hudson Howells has been engaged by RES Australia to undertake a Socio-Economic Impact Assessment on the project in terms of economic benefits to South Australia and the local region (i.e. the Light Regional Council and Regional Council of Goyder). This report contains the following key assessments:

- A Regional Baseline Assessment that details the socio-economic environment of the region for both the Light Regional Council and Regional Council of Goyder. It is recognised that transmission lines will travel through the Mid Murray Council region (to Truro) but there will be little socio economic impact on this region.

- An economic assessment of the Twin Creek Wind Farm Project in terms of economic benefits to local communities of \ Goyder and Light, the broader region of Barossa and Lower North (ABS regions) and also to the state of South Australia.

- An assessment of the associated benefits of offsetting carbon by displacing the need for further non-renewable generation development, such as coal or gas fired power stations.

In addition to the above, consideration is given in this assessment to the potential impact of the project on local property values.

2 REGIONAL BASELINE ASSESSMENT - LIGHT

2.1 LOCATIONAL ANALYSIS

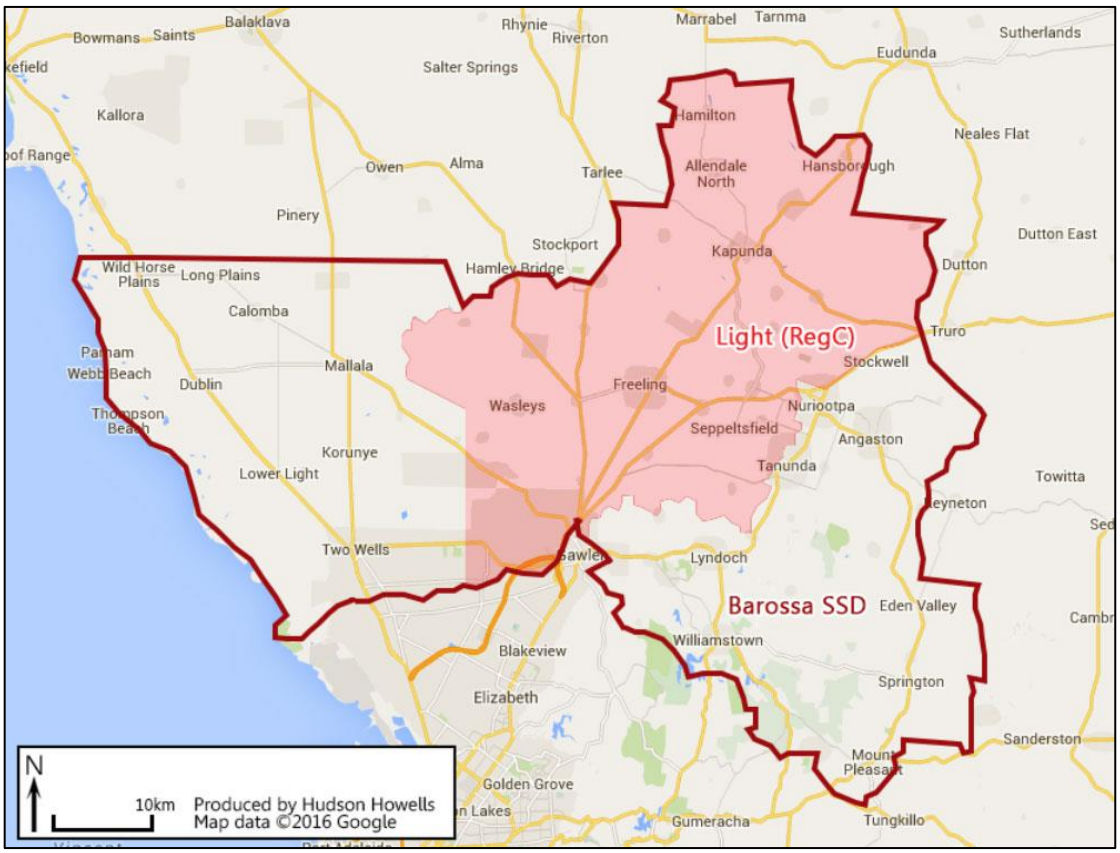
The information contained in this section has been sourced from publicly available data with relevant sources noted and includes:

- A brief description of the Light Regional Council.
- An overview of population growth in the Light Regional Council Local Government Area (LGA), including forecast future growth in population in the region.
- An analysis of socio-demographics of the Light LGA population.
- A brief analysis of internal population migration into and out of the Light LGA.
- An analysis of employment trends in Light LGA, including the growth in employment, using the latest 2011 Census data.
- An analysis of businesses within the Light LGA by industry, including size and turnover.

The Light Regional Council is located within the Barossa Statistical Subdivision (SSD) and is located north-east of the Adelaide metropolitan area, stretching between the District Council of Barossa to the east and District Council of Mallala to the west. The Barossa SSD forms the northern section of the Outer Adelaide Statistical Division, which is included within the Greater Adelaide region. The Council contains the townships of Kapunda, Greenock, Freeling, Wasleys and Roseworthy, and the suburb of Hewett. The region mixes a rich mining heritage with farming, with the benefits of the Barossa Valley. Map 2.1 illustrates the Council's boundary in relation to the surrounding councils.

The Sturt Highway and Barrier Highway are the key transport routes through the region, providing regional access from Adelaide, and further to regional New South Wales and Victoria. Main roads provide access to regional towns within the Council and alternative routes to other major regional towns throughout the State.

Map 2.1 – Light Regional Council



2.2 POPULATION AND DEMOGRAPHICS

2.2.1 Historical Population

Historical Estimated Resident Population (ERP) figures are released annually by the Australian Bureau of Statistics (ABS). Table 2.2 compares the historical population levels of Light LGA in comparison with the Barossa SSD, Greater Adelaide and South Australia. The Barossa SSD region comprises the Local Government Areas of Light, Barossa, and Mallala. Key points to note from Table 2.2 include:

- Light LGA population increased by over 3,400 people between 2001 and 2011. This represented average growth of 2.9% per annum, which exceeded the average South Australian population growth of 0.8% per annum over the same period.

- Historically, around 30% of the Barossa SSD region resided within the Light LGA.

- Current population of Light LGA is estimated at around 14,840 people.

Table 2.2 –Estimated Resident Population, 2001 – 2015[1]

	Light LGA	Barossa SSD	Greater Adelaide	South Australia
2001	10,542	37,431	1,147,168	1,511,728
2006	12,830	42,413	1,189,442	1,567,888
2011	13,984	44,992	1,252,804	1,639,614
2013(r)	14,422	45,830	1,279,662	1,670,274
2014(r)	14,653	46,304	1,292,984	1,685,550
2015(p)	14,841	46,695	1,304,998	1,698,660
Av. Annual Change (%)				
2001-2006	4.0%	2.5%	0.7%	0.7%
2006-2011	1.7%	1.2%	1.0%	0.9%
2011-2015	1.5%	0.9%	1.0%	0.9%
2001-2011	2.9%	1.9%	0.9%	0.8%

1. As at June. (r) revised; (p) preliminary
Source: Australian Bureau of Statistics, Regional Population Growth, Australia, Cat. No. 3218.0.

2.2.2 Forecast Population

Table 2.3 provides population forecast comparisons for Light LGA, Barossa SSD, Greater Adelaide and South Australia from 2016 to 2031. Population forecasts are as presented in the Department of Planning Transport and Infrastructure (DPTI) 'Population Projections for South Australian Local Government Areas, 2011-31' released in February 2016.

Table 2.3 –Estimated Resident Population, 2016 – 2031[1]

	Light LGA	Barossa SSD	Greater Adelaide	South Australia
2015 ERP	14,841	46,695	1,304,998	1,698,660
2016	15,295	48,959	1,416,420	1,715,299
2021	16,499	53,186	1,488,821	1,791,767
2026	17,712	57,587	1,560,468	1,866,715
2031	18,760	62,010	1,628,083	1,936,812
Av. Annual Change (%)				
2016-2021	1.5%	1.7%	1.0%	0.9%
2021-2026	1.4%	1.6%	0.9%	0.8%
2026-2031	1.2%	1.5%	0.9%	0.7%

1. As at June.
Source: Department of Planning, Transport and Infrastructure, Government of South Australia, 2016, Population Projections for South Australian Local Government Areas, 2011-31, February 2016 release

Future population growth for Light LGA is projected to increase to nearly 18,800 people by 2031, representing a net increase of over 3,900 people from 2015, or an average increase of 1.5% per annum over the 16-year period. In comparison, Barossa SSD is forecast to have a

slightly higher population growth of 1.8% per annum between 2015 and 2031, and South Australia is forecast to increase by an average of 0.8% per annum over the same period.

2.2.3 Socio-demographic Profile

Key socio-demographic characteristics of the Light LGA from the 2011 Census are provided in Table 2.4, with the main features as follows:

- The average age distribution of Light LGA residents indicates a younger family profile, with over 22% of the population aged under 15 years, and an average age of 38 years. In comparison, the Barossa SSD has an older age with an average age of 41 years.

- Average weekly per capita income of Light LGA residents is 7% above the South Australian average and 3% above the Barossa SSD average.

- Average weekly household income is 22% above the South Australian average.

- Average household size is higher than the South Australian average of 2.4 people, reflecting the younger family profile of the region.

- House ownership within the Light LGA is higher when compared to both Barossa SSD and South Australia (85% compared to 81% and 71% respectively). Median monthly mortgage payments are $70 less when compared to the South Australian median ($1,430 compared to $1,500).

- Car ownership is higher than the South Australian average of 91% of households owning one or more cars, reflecting the regional location.

Table 2.4 – Light LGA Socio-Economic Characteristics, 2011

	Light LGA	Barossa SSD	Greater Adelaide	South Australia
Age Distribution:				
0 - 14 years	22.6%	19.9%	17.7%	19.3%
15 - 24 years	12.5%	11.1%	13.7%	13.3%
25 - 44 years	25.1%	23.8%	27.2%	28.1%
45 - 64 years	28.5%	29.4%	26.0%	25.3%
65+ years	11.3%	15.8%	15.4%	14.0%
Median Age	38	41	39	39
Dependency Ratio[1]	33.9%	35.7%	33.1%	33.3%
Av. Weekly Per Capita Income	$570	$551	$554	$534
Per Capita Income Var.[2]	7%	3%	4%	
Household Income:				
$0 - $31,199	19.3%	24.2%	25.1%	26.7%
$31,200 - $77,999	39.7%	40.9%	38.1%	38.8%
$78,000 - $155,999	33.5%	28.9%	28.6%	27.1%
$156,000+	7.5%	6.0%	8.2%	7.3%
Av. Weekly Household Income	$1,274	$1,102	$1,106	$1,044
Household Income Var.[2]	22%	6%	6%	
Av. Household Size	2.8	2.5	2.4	2.4
Housing Status:				
Owner/purchaser[3]	84.9%	80.9%	70.7%	70.9%
Renter	15.1%	19.1%	29.3%	29.1%
Median Monthly Mortgage	$1,430	$1,343	$1,545	$1,500
Median Weekly Rent	$200	$200	$250	$220
Car Ownership:				
% 0 cars	2.2%	3.8%	9.6%	9.0%
% 1 car	24.0%	29.6%	38.5%	37.8%
% 2+ cars	73.8%	66.7%	51.9%	53.2%

Note: Based on place of enumeration.
1. Dependency ratio refers to the proportion of the population aged between 0-14 and over 65 years.
2. Compared to the South Australian benchmark.
3. 'Other' tenure types have not been included.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

2.2.4 Internal Migration

The following table highlights net migration between 2006 and 2011 for the Light LGA.

The region had a net population gain of 1,080 people through migration. Net population gains to the region came from the Cities of Playford, Salisbury, and Tea Tree Gully, while top statistical areas for population migration out of Light LGA were the adjacent Barossa LGA, and southern LGAs of The Coorong and Alexandrina.

Table 2.5 – Key Statistical Areas Ranked by Light LGA Net Migration

Statistical Area	Net Gain	Statistical Area	Net Loss
Playford (C)	240	Barossa (DC)	-95
Overseas	206	The Coorong (DC)	-17
Salisbury (C)	199	Alexandrina (DC)	-16
Tea Tree Gully (C)	153	Queensland	-15
Gawler (T)	87	Victor Harbor (C)	-14
New South Wales	51	Adelaide (C)	-13
Port Adelaide Enfield (C)	41	Yorke Peninsula (DC)	-12
Marion (C)	33	Norwood Payneham St Peters (C)	-10
Clare and Gilbert Valleys (DC)	26	Barunga West (DC)	-9
Victoria	26	Berri and Barmera (DC)	-9
Wakefield (DC)	22	Flinders Ranges (DC)	-9
Northern Territory	21	Tasmania	-9

2.3 LABOUR MARKET

2.3.1 Light LGA Employment Profile – Key Trends

The demographics and employment profile of Light LGA residents has changed over the years due to an aging population.

Examining Census information from 2006 and 2011, Table 2.6 outlines the key demographic trends for the residents in Light LGA in comparison to Barossa SSD and Greater Adelaide.

The key findings from this analysis are as follows:

- Incomes have increased by 22%, stronger compared to the Barossa SSD (20.3%) and slightly lower than that experienced across Greater Adelaide (23.9%).

- The age profile of the Light LGA population is becoming slightly older, with population aged 25-44 years decreasing from 27.8% in 2006 to 25.1% in 2011 (-2.7%), greater than the Barossa SSD benchmark change (-1.6%). In comparison, the Greater Adelaide population is aging slower, with a decrease in the 25-44 year old age bracket decreasing by 0.3% over the same period.

- Blue-collar occupations have decreased in the Light LGA. In 2011, 38.1% of the region's population were working in blue-collar occupations, which is lower than 2006 (40.4%). This proportion is higher than the Greater Adelaide benchmark and slightly lower than Barossa SSD, indicating the high proportion of industrial employment in the region.

- Labour force participation within the Light LGA has increased to 79.6% (+3.5%), remains comparable to Barossa SSD (80.1%) and is higher than the Greater Adelaide average (74.7%).

- Unemployment in the Light LGA is some 0.4% higher than the Barossa SSD (4.3% compared to 3.9%) and lower when compared to the Greater Adelaide average of 5.8%.

The demographic trends occurring in the Light LGA are consistent with an aging population and decreasing employment opportunities within the region.

Table 2.6 – Light LGA Resident Population Demographics

	Light (RegC)	Barossa SSD	Greater Adelaide
Median Weekly Per Capita Income:			
% growth 2006-2011	*+22.1%*	*+20.3%*	*+23.9%*
Population Aged 25-44 Years:			
% change 06-11	*-2.7%*	*-1.6%*	*-0.3%*
Blue Collar Occupations:			
2006	40.4%	41.9%	31.6%
2011	38.1%	40.3%	30.1%
% change 06-11	*-2.2%*	*-1.6%*	*-1.5%*
Labour Force Participation:			
2006	76.1%	76.9%	72.3%
2011	79.6%	80.1%	74.7%
% change 06-11	*3.5%*	*3.1%*	*2.4%*
Unemployment[1]:			
2006	4.1%	3.9%	5.2%
2011	4.3%	3.9%	5.8%
% change 06-11	*+0.1%*	*+0.0%*	*+0.5%*

Note: Based on place of usual residence.
1. Unemployed as proportion of total labour force.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

2.3.2 Resident Labour Force Structure

The following Table 2.7 examines the labour force and age profile of Light LGA population in 2011.

- Light LGA had a labour force of 7,200 people, of who 58.1% were employed full-time.

- The proportion of full-time workers is higher when compared to Greater Adelaide (56.9%).

- As mentioned previously the unemployment rate of 4.3% in 2011 is lower than the Greater Adelaide average of 5.8%.

- It is clear that youth unemployment is particularly high, with 24% of unemployed aged between 15-19 years compared to 19% in Greater Adelaide.

Table 2.7 – Light LGA Resident Population Demographics

	Light (RegC)	Barossa SSD	Greater Adelaide
Employed:			
- Full-time	58.1%	58.7%	56.9%
- Part-time	31.6%	31.8%	31.6%
- Away from work	6.0%	5.5%	5.7%
Total Employed	95.7%	96.1%	94.2%
Unemployed:			
- Looking for full-time work	2.4%	2.4%	3.4%
- Looking for part-time work	1.9%	1.6%	2.4%
Total Unemployed	4.3%	3.9%	5.8%
Total Labour Force	7,212	16,933	612,227
Not in the labour force	3,108	8,728	352,642
Unemployed:			
15-19 years	24%	22%	19%
20-24 years	16%	14%	19%
25-29 years	11%	10%	12%
30-34 years	7%	7%	10%
35-39 years	9%	9%	9%
40-44 years	9%	8%	8%
45-49 years	9%	11%	8%
50-54 years	6%	8%	6%
55-59 years	5%	7%	5%
60-64 years	4%	3%	3%

Note: Based on place of usual residence.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

2.3.3 Employment by Industry

Census data for 2006 and 2011 also show that the changing demographics are resulting in a shift in the type of industries employing these residents, as outlined in Tables 2.8 and 2.9.

Table 2.8 indicates that industrial employment is significant within the Light LGA with over a third of residents employed within Manufacturing, Construction, Transport/Warehousing, and Wholesale Trade (33.6% compared to 26.2% of Greater Adelaide). The proportion of Light LGA residents employed in Manufacturing has decreased to 17.5% (-2.1% between 2006 and 2011), while Health Care increased by 1.3% in the five years to 2011 to 11.0%.

Table 2.8 – Light LGA Proportion of Population by Industry, 2006 - 2011

	Light LGA			Greater Adelaide
	2006	2011	Change	2011
Manufacturing	19.5%	17.5%	-2.1%	10.6%
Health care and social assistance	9.7%	11.0%	1.3%	14.5%
Retail trade	10.8%	10.1%	-0.7%	11.6%
Agriculture, forestry and fishing	12.1%	9.5%	-2.6%	1.0%
Construction	8.0%	8.1%	0.1%	7.7%
Education and training	7.2%	7.3%	0.1%	8.4%
Public administration and safety	5.0%	6.4%	1.3%	7.8%
Accommodation and food services	4.6%	5.5%	0.9%	6.2%
Transport, postal and warehousing	4.8%	4.8%	-0.1%	4.2%
Administrative and support services	3.1%	3.4%	0.3%	3.6%
Professional, scientific and technical services	3.0%	3.3%	0.3%	6.4%
Wholesale trade	3.0%	3.2%	0.2%	3.7%
Financial and insurance services	1.8%	1.9%	0.1%	3.5%
Mining	0.8%	1.1%	0.4%	0.7%
Electricity, gas, water and waste services	0.6%	1.0%	0.4%	1.4%
Arts and recreation services	0.9%	0.9%	0.1%	1.4%
Rental, hiring and real estate services	1.0%	0.9%	-0.2%	1.4%
Information media and telecommunications	1.0%	0.8%	-0.2%	1.7%
Other services	3.2%	3.3%	0.2%	4.1%

Note: Based on place of usual residence.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

2.3.4 Employment by Occupation

Table 2.9 provides an overview of the change in occupations within Light LGA between 2006 and 2011.

Although a third of Light LGA residents are employed within industrial sectors (33.6% compared to 30% of Greater Adelaide), over half of occupations within Light LGA are white-collar.

Blue-collar employment decreased by 2.5% between 2006 and 2011, with the greatest reduction of occupations within the Labourers category (-3.1%). Employment within Community and personal service category increased by 2.2% to 10.4% of the Light LGA population.

Table 2.9 – Light LGA Proportion of Population by Occupation, 2006 – 2011

	Light LGA			Greater Adelaide
	2006	2011	Change	2011
Blue Collar:				
Labourers	16.8%	13.7%	-3.1%	10.1%
Machinery Operators and Drivers	7.5%	8.0%	0.6%	5.8%
Technicians and Trades Workers	16.1%	16.2%	0.1%	14.1%
Total Blue Collar	40.4%	37.9%	-2.5%	30.0%
White Collar:				
Managers	18.1%	16.7%	-1.4%	11.3%
Professionals	12.8%	13.7%	0.9%	21.9%
Clerical and Administrative Workers	8.2%	10.4%	2.2%	10.9%
Sales Workers	12.4%	12.7%	0.3%	15.7%
Community and Personal Service Workers	8.2%	8.6%	0.5%	10.1%
Total White Collar	59.6%	62.1%	2.5%	70.0%

Note: Based on place of usual residence.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

2.4 JOURNEY TO WORK

Tables 2.10 to 2.11 analyse the structure employment of both Light LGA residents and those employed within the region who live outside the LGA. The following tables are based on Journey to Work data from the 2011 Census.

2.4.1 Working within Light LGA

The total workforce employed in Light LGA in 2011 was over 3,700 people.

Table 2.10 shows that workers commute to the Light LGA from close proximity to the region, with over half of employment in Light LGA filled by Light LGA residents (51%). Industrial industries are more likely to employ residents from beyond the Barossa SSD (63% compared to 71% of employees within other industries) while employees in other industries are more likely to reside locally, e.g. 70% of Light LGA residents working within 'Agriculture, Forestry and Fishing' industries.

Table 2.10 – Light LGA Workforce by Home LGA, 2011

	Total Industrial Industries		Total Other Industries	Total Industries
Home LGA	**No.**	**%**	**%**	**%**
Light (RegC)	557	40%	57%	51%
Barossa (DC)	298	21%	12%	16%
Mallala (DC)	20	1%	2%	2%
Total Barossa SSD	*875*	*63%*	*71%*	*68%*
Clare and Gilbert Valleys (DC)	17	1%	2%	2%
Goyder (DC)	10	1%	1%	1%
Wakefield (DC)	19	1%	2%	2%
Total Lower North SSD	*46*	*3%*	*5%*	*4%*
Adelaide Hills (DC)	12	1%	1%	1%
Charles Sturt (C)	19	1%	1%	1%
Gawler (T)	158	11%	11%	11%
Mid Murray (DC)	30	2%	1%	1%
Playford (C)	107	8%	4%	5%
Port Adelaide Enfield (C)	12	1%	1%	1%
Salisbury (C)	51	4%	2%	3%
Tea Tree Gully (C)	35	3%	1%	2%
Remainder SA	46	3%	2%	3%
Interstate	3	0%	0%	0%

Note: Based on place of usual residence.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

2.4.2 Light LGA Resident Workforce

Table 2.11 provides an overview of the locations where residents of Light LGA work.

Nearly half of Light LGA residents work within the Barossa SSD (45%) with over a quarter of residents working locally within Light LGA (28%). Gawler LGA is a popular location for residents working in other industries (14%) with a total of 11% employed within that region. Light LGA residents were likely to travel to LGAs close to home, including Playford LGA (8%), Salisbury LGA (8%) and Port Adelaide Enfield (5%), and 4% travelling further to Adelaide for work.

Table 2.11 – Light LGA Workforce by Work LGA, 2011

	Total Industrial Industries		Total Other Industries	Total Industries
Work LGA	**No.**	**%**	**%**	**%**
Light (RegC)	558	25%	30%	28%
Barossa (DC)	437	20%	15%	16%
Mallala (DC)	12	1%	1%	1%
Total Barossa SSD	*1,007*	*46%*	*45%*	*45%*
Adelaide (C)	24	1%	5%	4%
Charles Sturt (C)	59	3%	1%	1%
Clare and Gilbert Valleys (DC)	21	1%	1%	1%
Gawler (T)	94	4%	14%	11%
Goyder (DC)	6	0%	1%	1%
Norwood Payneham St Peters (C)	12	1%	1%	1%
Playford (C)	189	9%	8%	8%
Port Adelaide Enfield (C)	194	9%	3%	5%
Salisbury (C)	198	9%	7%	8%
Tea Tree Gully (C)	16	1%	1%	1%
Wakefield (DC)	3	0%	1%	1%
West Torrens (C)	35	2%	1%	1%
Remainder SA	320	14%	10%	12%
Interstate	29	1%	1%	1%

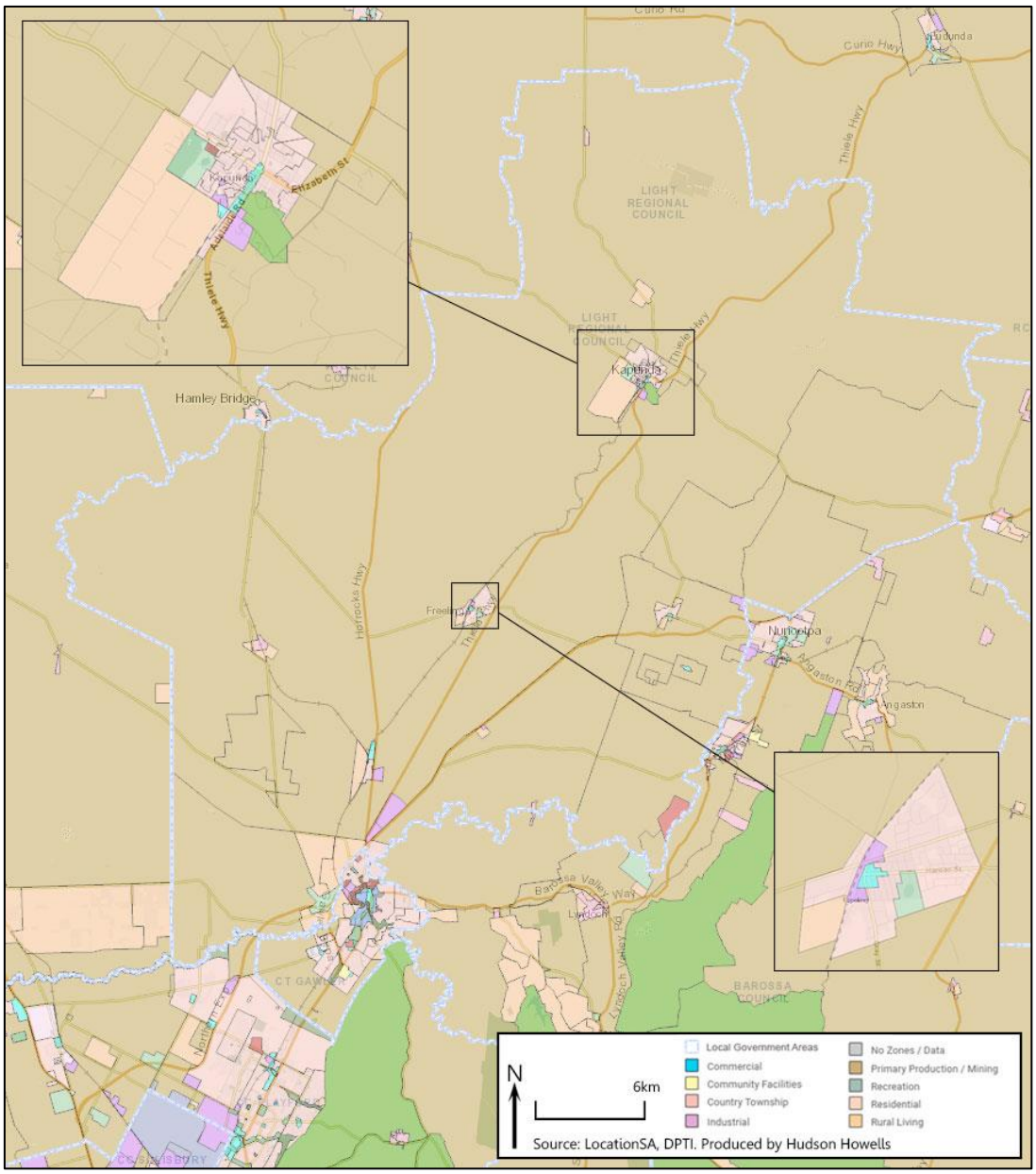
Note: Based on place of usual residence.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

2.5 EMPLOYMENT TRENDS

2.5.1 Land Use

As shown in Map 2.1, the Light LGA is predominantly currently zoned for primary production. Larger towns of Kapunda and Freeling are primarily residential with rural living on the fringe of the town, with commercial uses located along main roads and adjacent industrial areas. Townships of Wasleys, Greenock, Allendale North, Roseworthy are a mix of residential and rural living with associated small commercial areas.

Map 2.1 –Land Use



2.5.2 Number of Businesses

Data relating to the 'Counts of Australian Businesses' are released annually by the Australian Bureau of Statistics (ABS). The counts in this release are heavily influenced by entry and exits within Australia's small business sector, and we note that the scope of business counts is limited to businesses actively remitting in a GST role.

Table 2.12 and Chart 2.1 compares the change in the number of businesses within the Light LGA between 2010 and 2015 by employment size and industry division.

Key points to note from Table 2.12 and Chart 2.1 include:

- Light LGA had a total of 823 businesses in 2015, decreasing by one business since 2010.

- Businesses employing four or less employees accounted for 91% of total businesses in 2015, comprising 507 non-employing businesses and 244 businesses employing between one and four employees.

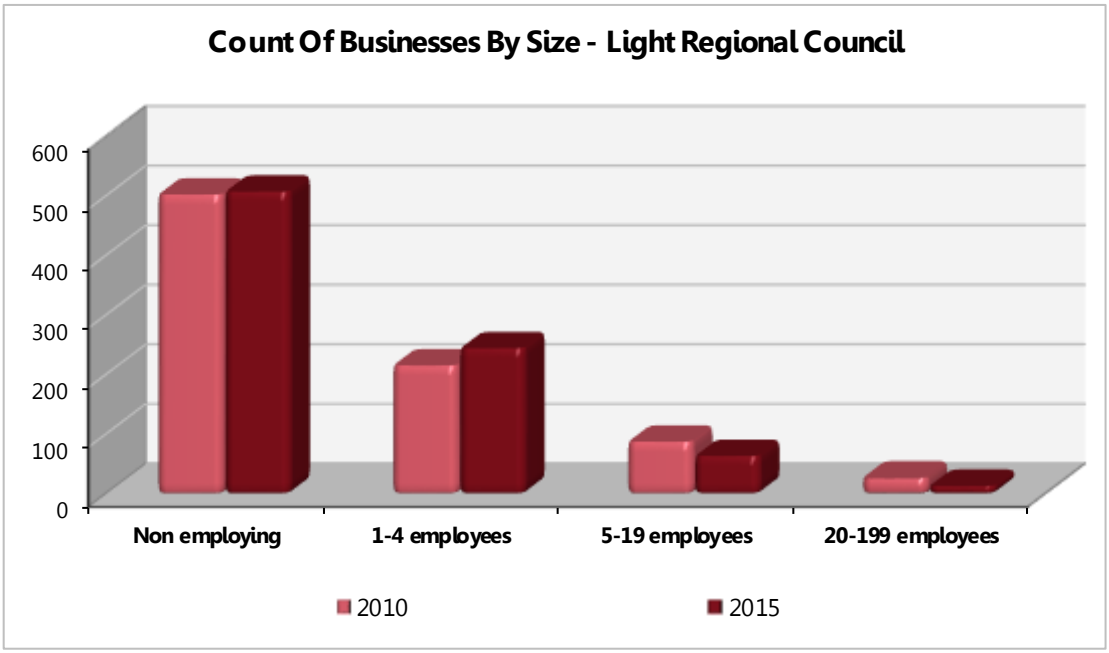
- Agriculture, Forestry and Fishing had the most businesses operating in the Light LGA in 2015 (317 businesses or 39% of total businesses).

Table 2.12 – Count of Business by Industry and Size in Light LGA, 2010 – 2015

	4 or less employees			Total		
Industry	**2010**	**2015**	**% change**	**2010**	**2015**	**% change**
Agriculture, Forestry and Fishing	296	296	+0%	346	317	-8%
Construction	98	97	-1%	104	97	-7%
Rental, Hiring & Real Estate Services	56	68	+21%	59	68	+15%
Manufacturing	52	40	-23%	61	57	-7%
Transport, Postal and Warehousing	33	39	+18%	39	45	+15%
Prof., Scientific & Technical Services	29	37	+28%	38	41	+8%
Retail Trade	25	24	-4%	41	35	-15%
Financial and Insurance Services	20	35	+75%	20	35	+75%
Accommodation and Food Services	17	14	-18%	26	25	-4%
Wholesale Trade	13	22	+69%	13	25	+92%
Health Care and Social Assistance	10	19	+90%	10	19	+90%
Administrative and Support Services	12	12	+0%	15	12	-20%
Arts and Recreation Services	6	7	+17%	6	7	+17%
Education and Training	9	6	-33%	9	6	-33%
Public Administration and Safety	3	3	+0%	3	3	+0%
Elec., Gas, Water & Waste Services	3	0	-	3	0	-%
Other Services	28	28	+0%	31	31	+0%
Total	*710*	*747*	*+5%*	*824*	*823*	*-0%*

Note: Excludes 'Currently unknown'.
Source: Australian Bureau of Statistics, Counts of Australian Businesses, including Entries and Exits, Cat. No. 8165.0.

Chart 2.1 - Count of Business by Size in Light LGA, 2010 – 2015



Source: Australian Bureau of Statistics, Counts of Australian Businesses, including Entries and Exits, Cat. No. 8165.0.

2.5.3 Business Turnover Levels

Table 2.13 and Chart 2.2 compares the change in the number of businesses within the Light LGA between 2010 and 2015 by level of turnover and industry division.

Key points to note from Table 2.13 and Chart 2.2 include:

- Nearly a quarter of all businesses within the Light LGA had an annual turnover over more than $500,000 (22%), including 4% or 36 businesses with an annual turnover of $2 million or more.

- The number of businesses within turnover ranges has increased for all ranges between 2010 and 2015, with the exception of those businesses with turnover less than $100,000 per annum.

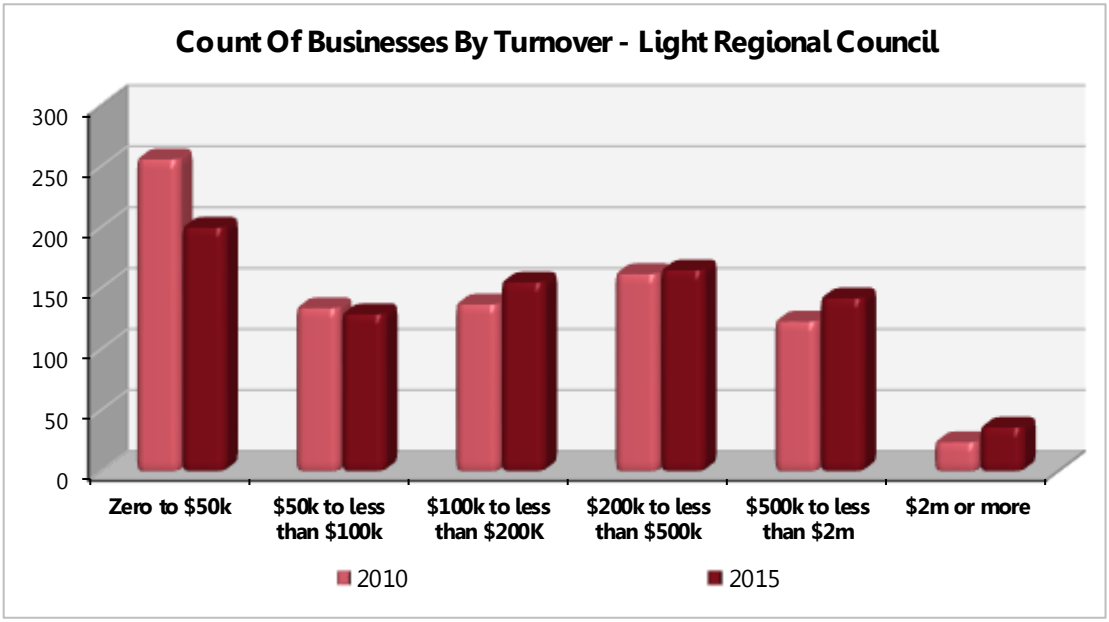
- Agriculture, Forestry and Fishing had the greatest number of businesses in the Light LGA with an annual turnover of more than $2 million in 2015 (11 businesses).

Table 2.13 – Count of Business by Industry and Turnover in Light LGA, 2010 – 2015

	$200k+ turnover			Total		
Industry	**2010**	**2015**	**% change**	**2010**	**2015**	**% change**
Agriculture, Forestry and Fishing	129	137	+6%	337	317	-6%
Construction	32	35	+9%	111	98	-12%
Rental, Hiring & Real Estate Services	14	25	+79%	61	69	+13%
Manufacturing	34	35	+3%	65	57	-12%
Transport, Postal and Warehousing	14	21	+50%	36	44	+22%
Prof., Scientific & Technical Services	12	11	-8%	33	41	+24%
Financial and Insurance Services	0	6	-	22	35	+59%
Retail Trade	22	15	-32%	44	33	-25%
Accommodation and Food Services	12	13	+8%	21	24	+14%
Wholesale Trade	6	6	+0%	12	23	+92%
Health Care and Social Assistance	13	12	-8%	19	20	+5%
Administrative and Support Services	0	3	-	11	10	-9%
Arts and Recreation Services	6	3	-50%	15	7	-53%
Education and Training	3	3	+0%	6	6	+0%
Elec., Gas, Water & Waste Services	0	0	-	6	3	-50%
Public Administration and Safety	3	0	-100%	6	3	-50%
Mining	0	3	-	0	3	-
Other Services	9	15	+67%	21	31	+48%
Total	*309*	*343*	*+11%*	*826*	*824*	*-0%*

Note: Excludes 'Currently unknown'.
Source: Australian Bureau of Statistics, Counts of Australian Businesses, including Entries and Exits, Cat. No. 8165.0.

Chart 2.2 - Count of Business by Turnover in Light LGA, 2010 – 2015



Source: Australian Bureau of Statistics, Counts of Australian Businesses, including Entries and Exits, Cat. No. 8165.0.

2.6 TOWNSHIP SERVICES

In addition to accommodation, workers locating temporarily to the Study Area will require a wide range of other convenience services, and the project will also need to source trade and other services from businesses located in the immediate region. This section provides an overview of the services located in the main townships in the Light region of the Study Area.

The Light Regional Council contains the townships of Kapunda, Greenock, Freeling, Wasleys and Roseworthy, and the suburb of Hewett. The region mixes a rich mining heritage with farming, with the benefits of the Barossa Valley wine region.

Kapunda serves as the major service centre for the region and will be the major source of services likely to be required to support the proposed wind farm project. It is easily accessed from Adelaide (77 kilometres) and its northern suburbs via the Fatchen Expressway and is geographically well positioned to the major tourism centres of the Barossa Valley, Clare Valley and the River Murray. Kapunda is located approximately 10 kilometres south west of the project and offers a range of regional services including:

- Accommodation options ranging from the Kapunda Tourist Park to several bed and breakfast and farm stay options. Other accommodation options within the Light Regional Council area and within easy access of the project site include:
    - Novatel Barossa Valley Resort.
    - The Louise.
    - The Reserve Barossa Valley.
    - Seppeltsfield Vineyard Cottages.
- Major banks and postal services.
- Medical and emergency services (Kapunda Hospital and medical practices).
- Hotels – Kapunda (4), plus Roseworthy (1), Allendale North (1), Freeling (2), Greenock (1) and Wasleys (1).
- Main street retail, café and bakery services.
- Automotive and mechanical services.

- Tourism and related services in Kapunda and the surrounding region, including vineyards and wineries.

- Recreation facilities including the Kapunda Library, Kapunda Bowling Club and Kapunda Golf Course.

3 REGIONAL BASELINE ASSESSMENT - GOYDER

3.1 LOCATIONAL ANALYSIS

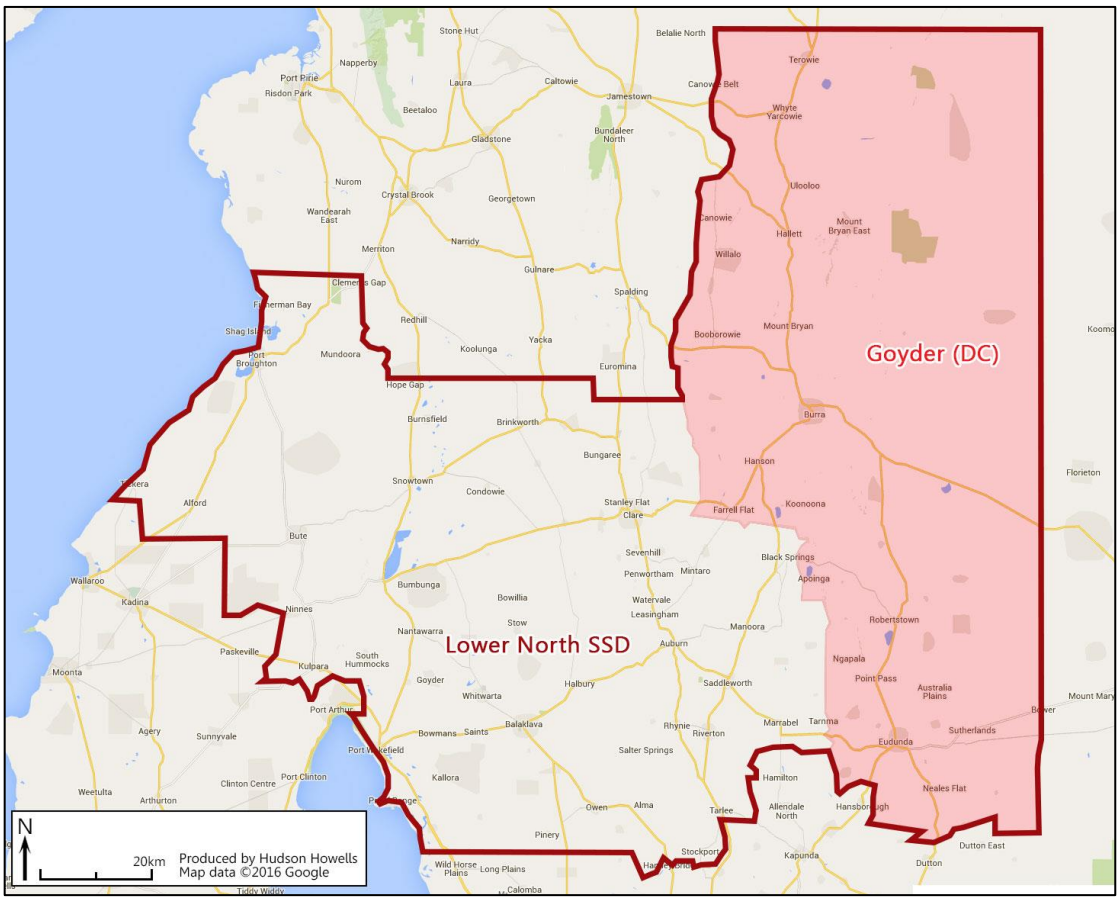
The information contained in this section has again been sourced from publicly available data with relevant sources noted and includes:

- A brief description of the Goyder Regional Council.
- An overview of population growth in the Goyder Regional Council Local Government Area (LGA), including forecast future growth in population in the region.
- An analysis of socio-demographics of the Goyder LGA population.
- A brief analysis of internal population migration into and out of the Goyder LGA.
- An analysis of employment trends in Goyder LGA, including the growth in employment, using the latest 2011 Census data.
- An analysis of businesses within the Goyder LGA by industry, including size and turnover.

The Goyder District Council is located within the Lower North Statistical Subdivision (SSD) and is located in the Mid North of South Australia, stretching between the District Council of Peterborough to the north, Mid Murray Council to the lower east and south, and the Light Regional Council, and Clare and Gilbert Valleys District Councils, and Northern Areas to the west. The Lower North SSD stretches across from Unincorporated pastoral lands to the east to upper Yorke Peninsula and Spencer Gulf to the west. The Council contains the townships of Burra, Eudunda, Hallett, Robertstown, and Terowie, in addition to a number of smaller localities. The region combines a mix of agricultural and pastoral uses with an increasing manufacturing industry. Map 3.1 illustrates the Council's boundary in relation to the surrounding councils.

The Barrier Highway is the key transport route through the region, providing regional access from Adelaide and regional New South Wales (via Broken Hill). The Thiele Highway and Goyder Highway provide access to regional towns within the Council and alternative routes to other major regional towns in adjacent regions.

Map 3.1 – Goyder District Council



3.2 POPULATION AND DEMOGRAPHICS

3.2.1 Historical Population

Historical Estimated Resident Population (ERP) figures are released annually by the Australian Bureau of Statistics (ABS). Table 3.1 compares the historical population levels of Goyder LGA in comparison with the Lower North SSD, Non-Metro South Australia and South Australia. The Lower North SSD region comprises the Local Government Areas of Goyder, Clare and Gilbert Valleys, Wakefield and Barunga West. Key points to note from Table 3.1 include:

- Goyder LGA population decreased slightly between 2001 and 2011 (-47 people over ten years). This represented average growth of -0.1% per annum, which was significantly lower than the average South Australian population growth of 0.8% per annum over the same period.

- Historically, around 19% of the Lower North SSD region resided within the Goyder LGA.

- Current population of Goyder LGA is estimated at around 4,230 people.

Table 3.1 –Estimated Resident Population, 2001 – 2015[1]

	Goyder LGA	Lower North SSD	Non-Metro SA	South Australia
2001	4,272	21,852	364,560	1,511,728
2006	4,329	22,058	378,446	1,567,888
2011	4,225	22,333	386,810	1,639,614
2013(r)	4,237	22,502	390,612	1,670,274
2014(r)	4,241	22,575	392,566	1,685,550
2015(p)	4,232	22,609	393,662	1,698,660
Av. Annual Change (%)				
2001-2006	0.3%	0.2%	0.8%	0.7%
2006-2011	-0.5%	0.2%	0.4%	0.9%
2011-2015	0.0%	0.3%	0.4%	0.9%
2001-2011	-0.1%	0.2%	0.6%	0.8%

1. As at June. (r) revised; (p) preliminary
Source: Australian Bureau of Statistics, Regional Population Growth, Australia, Cat. No. 3218.0.

3.2.2 Forecast Population

Table 3.2 provides population forecast comparisons for Goyder LGA, Lower North SSD, Non-Metro South Australia and South Australia from 2016 to 2031. Population forecasts are as presented in the DPTI 'Population Projections for South Australian Local Government Areas, 2011-31' released in February 2016.

Table 3.2 –Estimated Resident Population, 2016 – 2031[1]

	Goyder LGA	Lower North SSD	Non-Metro SA	South Australia
2015 ERP	4,232	22,609	393,662	1,698,660
2016	4,245	22,637	298,879	1,715,299
2021	4,260	23,118	302,946	1,791,767
2026	4,326	23,687	306,247	1,866,715
2031	4,402	24,245	308,729	1,936,812
Av. Annual Change (%)				
2016-2021	0.1%	0.4%	0.3%	0.9%
2021-2026	0.3%	0.5%	0.2%	0.8%
2026-2031	0.3%	0.5%	0.2%	0.7%

1. As at June.
Source: Department of Planning, Transport and Infrastructure, Government of South Australia, 2016, Population Projections for South Australian Local Government Areas, 2011-31, February 2016 release

Future population growth for Goyder LGA is projected to increase to 4,400 people by 2031, representing a net increase of 170 people from 2015, or an average increase of 0.2% per annum over the 16-year period. In comparison, Lower North SSD is forecast to have a slightly higher population growth of 0.4% per annum between 2015 and 2031, and South Australia is forecast to increase by an average of 0.8% per annum over the same period.

3.2.3 Socio-demographic Profile

Key socio-demographic characteristics of the Goyder LGA from the 2011 Census are provided in Table 3.3, with the main features as follows:

- The average age distribution of Goyder LGA residents indicates an older age profile, with 21% of the population aged over 65 years, and an average age of 46 years. In comparison, the Lower North SSD has an established family profile with an average age of 44 years.

- Average weekly per capita income of Goyder LGA residents is 23% below the South Australian average and 12% below the Lower North SSD average.

- Average weekly household income is 28% below the South Australian average.

- Average household size is slightly lower than the South Australian average of 2.4 people, reflecting the older age profile of the region.

- House ownership within the Goyder LGA is higher when compared to both Lower North SSD and South Australia (79% compared to 77% and 71% respectively). Median monthly mortgage payments are $740 less when compared to the South Australian median ($758 compared to $1,500).

- Car ownership is higher than the South Australian average of 91% of households owning one or more cars, reflecting the regional location.

Table 3.3 – Goyder LGA Socio-Economic Characteristics, 2011

	Goyder LGA	Lower North SSD	Non-Metro SA	South Australia
Age Distribution:				
0 - 14 years	18.6%	19.2%	19.0%	19.3%
15 - 24 years	10.3%	10.1%	11.1%	13.3%
25 - 44 years	19.0%	21.1%	23.0%	28.1%
45 - 64 years	31.5%	30.1%	28.5%	25.3%
65+ years	20.5%	19.5%	18.3%	14.0%
Median Age	46	44	42	39
Dependency Ratio[1]	39.1%	38.7%	37.3%	33.3%
Av. Weekly Per Capita Income	$413	$468	$477	$534
Per Capita Income Var.[2]	-23%	-12%	-11%	
Household Income:				
$0 - $31,199	37.0%	32.9%	32.1%	26.7%
$31,200 - $77,999	43.1%	42.3%	41.3%	38.8%
$78,000 - $155,999	16.1%	20.7%	22.3%	27.1%
$156,000+	3.8%	4.1%	4.4%	7.3%
Av. Weekly Household Income	$755	$851	$881	$1,044
Household Income Var.[2]	-28%	-18%	-16%	
Av. Household Size	2.3	2.3	2.3	2.4
Housing Status:				
Owner/purchaser[3]	79.3%	77.0%	71.6%	70.9%
Renter	20.7%	23.0%	28.4%	29.1%
Median Monthly Mortgage	$758	$1,060	$1,170	$1,500
Median Weekly Rent	$120	$150	$155	$220
Car Ownership:				
% 0 cars	5.5%	5.0%	6.9%	9.0%
% 1 car	33.1%	33.5%	35.5%	37.8%
% 2+ cars	61.3%	61.4%	57.6%	53.2%

Note: Based on place of enumeration.
1. Dependency ratio refers to the proportion of the population aged between 0-14 and over 65 years.
2. Compared to the South Australian benchmark.
3. 'Other' tenure types have not been included.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

3.2.4 Internal Migration

The following table highlights net migration between 2006 and 2011 for the Goyder LGA.

The region had a net population loss of 96 people through migration. Net population gains to the region came from the City of Salisbury, and interstate from the Northern Territory and Queensland, while top statistical areas for population migration out of Goyder LGA were the nearby LGAs of Northern Areas, Barossa, Copper Coast and Gawler.

Table 3.4 – Key Statistical Areas Ranked by Goyder LGA Net Migration

Statistical Area	Net Gain	Statistical Area	Net Loss
Salisbury (C)	32	Northern Areas (DC)	-29
Overseas	30	Barossa (DC)	-26
Northern Territory	21	Copper Coast (DC)	-20
Queensland	20	Gawler (T)	-20
Onkaparinga (C)	18	Charles Sturt (C)	-16
Victoria	18	Loxton Waikerie (DC)	-15
Port Adelaide Enfield (C)	17	Alexandrina (DC)	-14
Kimba (DC)	9	Clare and Gilbert Valleys (DC)	-14
Whyalla (C)	9	Adelaide (C)	-13
		Wakefield (DC)	-12

3.3 LABOUR MARKET

3.3.1 Goyder LGA Employment Profile – Key Trends

The demographics and employment profile of Goyder LGA residents has changed over the years due to an aging population.

Examining Census information from 2006 and 2011, Table 3.5 outlines the key demographic trends for the residents in Goyder LGA in comparison to Lower North SSD and Non-Metro South Australia.

The key findings from this analysis are as follows:

- Incomes have increased by 23.7%, slightly stronger compared to the Lower North SSD (23.2%) and stronger than that experienced across Non-Metro South Australia (20.2%).

- The age profile of the Light LGA population is becoming older, with population aged 25-44 years decreasing from 23.3% in 2006 to 19.0% in 2011 (-4.3%), greater than the Lower North SSD benchmark change (-2.1%). In comparison, the Non-Metro South Australian population is aging slower, with the 25-44 year old age bracket increasing by 1.1% over the same period.

- Blue-collar occupations have decreased in the Goyder LGA. In 2011, 38.0% of the region's population were working in blue-collar occupations, which is higher than 2006 (36.8%). This proportion is higher than the Lower North SSD benchmark and slightly lower than the Non-Metro South Australian benchmark, indicating the high proportion of agricultural and industrial employment in the region.

- Labour force participation within the Goyder LGA has increased slightly to 73.6% (+0.3%), lower than both the Lower North SSD and Non-Metro South Australia benchmarks (75.9% and 74.1% respectively).

- Unemployment in the Goyder LGA is some 0.8% higher than the Lower North SSD (4.9% compared to 4.1%) and lower when compared to the Non-Metro South Australian average of 5.4%.

The demographic trends occurring in the Goyder LGA are consistent with an aging population and decreasing employment opportunities within the region.

Table 3.5 – Goyder LGA Resident Population Demographics

	Goyder LGA	Lower North SSD	Non-Metro SA
Median Weekly Per Capita Income:			
% growth 2006-2011	+23.7%	+23.2%	+20.2%
Population Aged 25-44 Years:			
% change 06-11	-4.3%	-2.1%	+1.1%
Blue Collar Occupations:			
2006	36.8%	36.6%	39.5%
2011	38.0%	36.8%	39.5%
% change 06-11	+1.3%	+0.2%	-0.0%
Labour Force Participation:			
2006	73.2%	73.3%	73.1%
2011	73.6%	75.9%	74.1%
% change 06-11	+0.3%	+2.7%	+0.9%
Unemployment[1]:			
2006	5.0%	4.2%	5.1%
2011	4.9%	4.1%	5.4%
% change 06-11	-0.1%	-0.1%	+0.3%

Note: Based on place of usual residence.
1. Unemployed as proportion of total labour force.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

3.3.2 Resident Labour Force Structure

The following Table 3.6 examines the labour force and age profile of Goyder LGA population in 2011.

- Light LGA had a labour force of 1,860 people, of who 58.2% were employed full-time.
- The proportion of full-time workers is higher when compared to Non-Metro South Australia (56.2%).
- As mentioned previously the unemployment rate of 4.9% in 2011 is lower than the Non-Metro South Australian average of 5.4%.
- It is clear that mature age unemployment is particularly high, with 42% of unemployed aged older than 45 years compared to 30% in Non-Metro South Australia.

Table 3.6 – Goyder LGA Resident Population Demographics

	Goyder LGA	Lower North SSD	Non-Metro SA
Employed:			
- Full-time	58.2%	57.5%	56.2%
- Part-time	31.7%	32.7%	31.6%
- Away from work	5.2%	5.8%	6.7%
Total Employed	95.1%	95.9%	94.6%
Unemployed:			
- Looking for full-time work	3.0%	2.5%	3.6%
- Looking for part-time work	1.9%	1.6%	1.8%
Total Unemployed	4.9%	4.1%	5.4%
Total Labour Force	1,858	10,176	170,936
Not in the labour force	1,387	6,907	112,585
Unemployed:			
15-19 years	15%	17%	17%
20-24 years	12%	14%	15%
25-29 years	10%	8%	10%
30-34 years	8%	6%	9%
35-39 years	0%	9%	9%
40-44 years	13%	11%	10%
45-49 years	18%	12%	10%
50-54 years	9%	10%	9%
55-59 years	0%	7%	7%
60-64 years	15%	6%	5%

Note: Based on place of usual residence.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

3.3.3 Employment by Industry

Census data for 2006 and 2011 also show that the changing demographics are resulting in a shift in the type of industries employing these residents, as outlined in Tables 3.7 and 3.8.

Table 3.7 indicates that employment within the agricultural industry is significant within the Goyder LGA with nearly a third of residents employed within Agriculture, Forestry and Fishing (31.7% compared to 14.3% of Non-Metro South Australia), with a quarter of the population employed in 'Sheep, Beef Cattle and Grain Farming' (25.9%). While the agriculture industry is the highest employer for Goyder LGA residents, employment within Agriculture, Forestry and Fishing has decreased by 2.5% between 2006 and 2011, while Administration and Support Services, and Accommodation and Food Services have increased in the five years to 2011 (+1.2% and +1.1% respectively).

Table 3.7 – Goyder LGA Proportion of Population by Industry, 2006 - 2011

	Goyder LGA			Non-Metro South Aus.
	2006	2011	Change	2011
Agriculture, forestry and fishing	34.2%	31.7%	-2.5%	14.3%
Manufacturing	11.2%	11.0%	-0.3%	11.4%
Health care and social assistance	9.9%	9.8%	-0.2%	11.6%
Retail trade	8.7%	9.1%	0.4%	10.8%
Accommodation and food services	5.0%	6.1%	1.1%	6.9%
Education and training	5.5%	5.8%	0.3%	7.1%
Construction	4.3%	4.5%	0.2%	7.4%
Transport, postal and warehousing	3.6%	3.8%	0.2%	4.4%
Public administration and safety	3.6%	3.7%	0.0%	4.9%
Administrative and support services	1.6%	2.8%	1.2%	3.1%
Professional, scientific and technical services	2.6%	1.7%	-0.8%	2.6%
Wholesale trade	2.4%	1.6%	-0.7%	3.1%
Mining	1.2%	1.1%	-0.1%	3.4%
Electricity, gas, water and waste services	0.8%	1.1%	0.3%	1.3%
Financial and insurance services	1.0%	0.9%	-0.1%	1.4%
Information media and telecommunications	0.7%	0.6%	-0.1%	0.7%
Rental, hiring and real estate services	0.3%	0.6%	0.2%	1.0%
Arts and recreation services	0.5%	0.5%	0.0%	0.8%
Other services	2.8%	3.8%	1.0%	3.7%

Note: Based on place of usual residence.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

3.3.4 Employment by Occupation

Table 3.8 provides an overview of the change in occupations within Goyder LGA between 2006 and 2011.

Nearly a third of Goyder LGA residents are employed within manager positions (30.3% compared to 17.9% of Non-Metro South Australia), with nearly three-quarters of those managers working within the Agriculture, Forestry and Fishing industry.

Blue-collar employment increased by 0.7% between 2006 and 2011, regardless of the reduction of occupations within the Technicians and Trades Workers category (-1.2%). Employment within Community and Personal Service and Sales Workers categories experienced the greatest increase between 2006 and 2011 (+1.9% and +1.6% respectively).

Table 3.8 – Goyder LGA Proportion of Population by Occupation, 2006 – 2011

	Goyder LGA			Non-Metro South Aus
	2006	2011	Change	2011
Blue Collar:				
Labourers	16.8%	17.7%	0.9%	15.8%
Machinery Operators and Drivers	5.6%	6.6%	1.0%	8.7%
Technicians and Trades Workers	14.9%	13.7%	-1.2%	15.2%
Total Blue Collar	37.3%	38.0%	0.7%	39.7%
White Collar:				
Managers	33.7%	30.3%	-3.4%	17.9%
Professionals	8.6%	8.2%	-0.4%	13.1%
Clerical and Administrative Workers	6.9%	8.8%	1.9%	10.0%
Sales Workers	8.4%	8.1%	-0.4%	10.7%
Community and Personal Service Workers	5.1%	6.7%	1.6%	8.6%
Total White Collar	62.7%	62.0%	-0.7%	60.3%

Note: Based on place of usual residence.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

3.4 JOURNEY TO WORK

Tables 3.9 to 3.10 analyse the structure employment of both Goyder LGA residents and those employed within the region who live outside the LGA. The following tables are based on Journey to Work data from the 2011 Census.

3.4.1 Working within Goyder LGA

The total workforce employed in Goyder LGA in 2011 was approximately 1,260 people.

Table 3.9 shows that workers commute to the Goyder LGA from close proximity to the region, with 84% of employment in Goyder LGA filled by Goyder LGA residents. The agricultural industry is more likely to employ local residents (93% compared to 78% of employees within other industries) while employees in other industries are more likely to travel from nearby regions, e.g. 7% of Barossa SSD residents travelling to work in Education and Health Care industries.

Table 3.9 – Goyder LGA Workforce by Home LGA, 2011

	Agriculture, Forestry & Fishing		Total Other Industries	Total Industries
Home LGA	**No.**	**%**	**%**	**%**
Goyder (DC)	413	93%	78%	84%
Clare and Gilbert Valleys (DC)	14	3%	7%	6%
Wakefield (DC)	0	0%	0%	0%
Total Lower North SSD	*427*	*96%*	*85%*	*90%*
Barossa (DC)	0	0%	1%	0%
Light (RegC)	0	0%	6%	3%
Mallala (DC)	0	0%	1%	0%
Total Barossa SSD	*0*	*0%*	*7%*	*4%*
Gawler (T)	0	0%	1%	1%
Northern Areas (DC)	13	3%	3%	2%
Remainder SA LGAs	0	0%	5%	2%
Interstate	3	1%	0%	1%

Note: Based on place of usual residence.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

3.4.2 Goyder LGA Resident Workforce

Table 3.10 provides an overview of the locations where residents of Goyder LGA work.

Nearly three-quarters of Goyder LGA residents work within the Lower North SSD (71%) with nearly two-thirds of residents working locally within Goyder LGA (61%). The Barossa SSD is a popular location for Goyder LGA residents working in other industries (9%). Of those employees working within the agriculture industry in Goyder LGA, three-quarters are local Goyder LGA residents.

Table 3.10 – Goyder LGA Workforce by Work LGA, 2011

	Agriculture, Forestry & Fishing		Total Other Industries	Total Industries
Home LGA	**No.**	**%**	**%**	**%**
Goyder (DC)	411	75%	57%	61%
Clare and Gilbert Valleys (DC)	19	3%	13%	9%
Wakefield (DC)	0	0%	0%	0%
Total Lower North SSD	430	78%	69%	71%
Barossa (DC)	7	1%	5%	3%
Light (RegC)	0	0%	4%	3%
Mallala (DC)	0	0%	0%	0%
Total Barossa SSD	7	1%	9%	6%
Mid Murray (DC)	8	1%	0%	1%
Northern Areas (DC)	4	1%	3%	2%
Remainder SA LGAs	90	16%	16%	19%
Interstate	9	2%	2%	2%

Note: Based on place of usual residence.
Source: Australian Bureau of Statistics, 2011 Census of Population and Housing (Basic Community Profile), Cat. No. 2001.0 - 2011 Census Tables.

3.5 EMPLOYMENT TRENDS

3.5.1 Land Use

As shown in Map 3.1, the Goyder LGA is predominantly currently zoned for primary production. The town of Burra consists of commercial zoned uses along Market Street with a large historical zone in the centre of the town, with residential living and industrial uses to the north-west. The town of Eudunda is primarily residential with commercial uses located along the main road and adjacent industrial areas.

Data relating to the 'Counts of Australian Businesses' are released annually by the Australian Bureau of Statistics (ABS). The counts in this release are heavily influenced by entry and exits within Australia's small business sector, and we note that the scope of business counts is limited to businesses actively remitting in a GST role.

3.5.2 Number of Businesses

Table 3.11 and Chart 3.1 compares the change in the number of businesses within the Goyder LGA between 2010 and 2015 by employment size and industry division.

Key points to note from Table 3.11 and Chart 3.1 include:

- Goyder LGA had a total of 554 businesses in 2015, decreasing by 54 businesses since 2010.

- Businesses employing four or less employees accounted for 86% of total businesses in 2015, comprising 325 non-employing businesses and 150 businesses employing between one and four employees.

- Agriculture, Forestry and Fishing had the most businesses operating in Goyder LGA in 2015 (338 businesses or 61% of total businesses).

Map 3.1 –Land Use

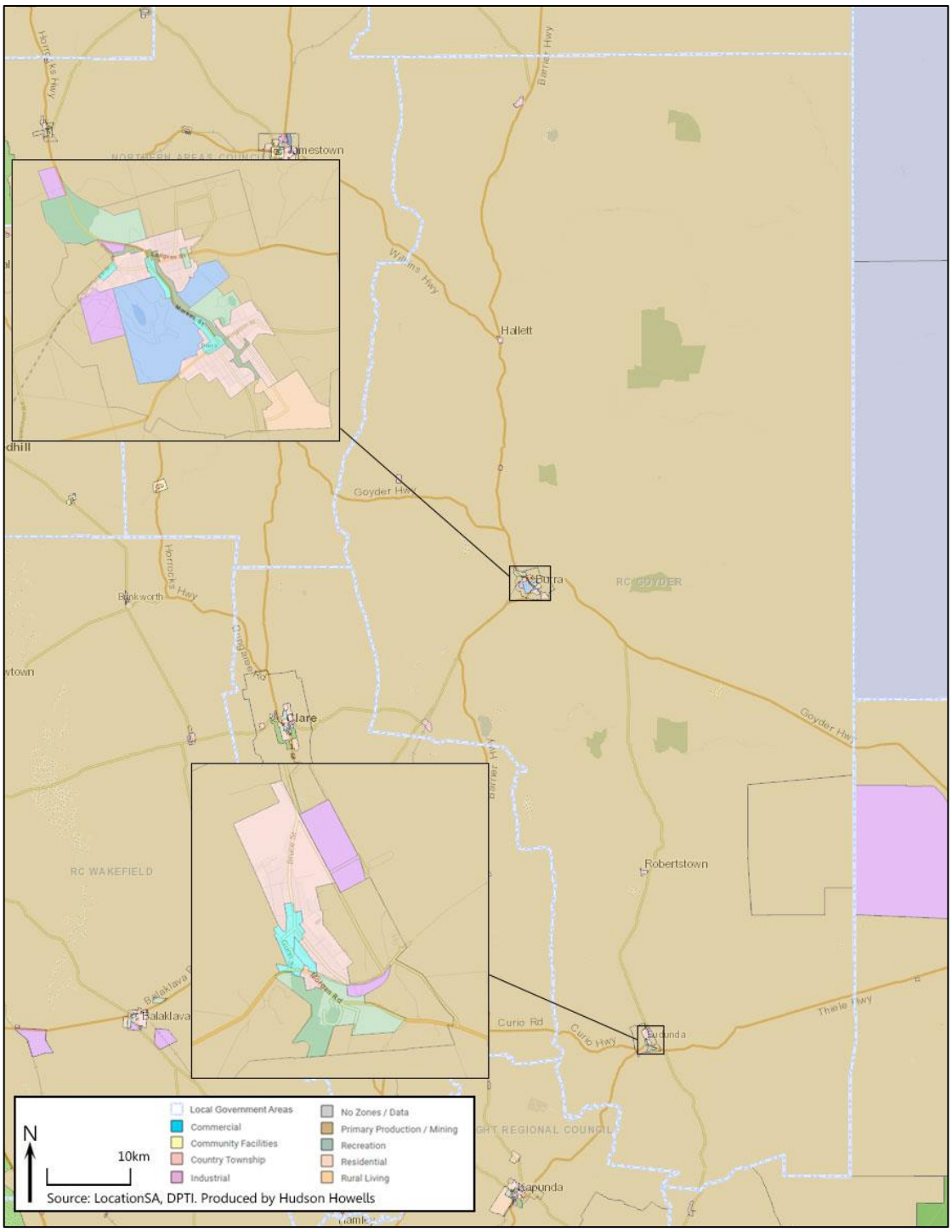
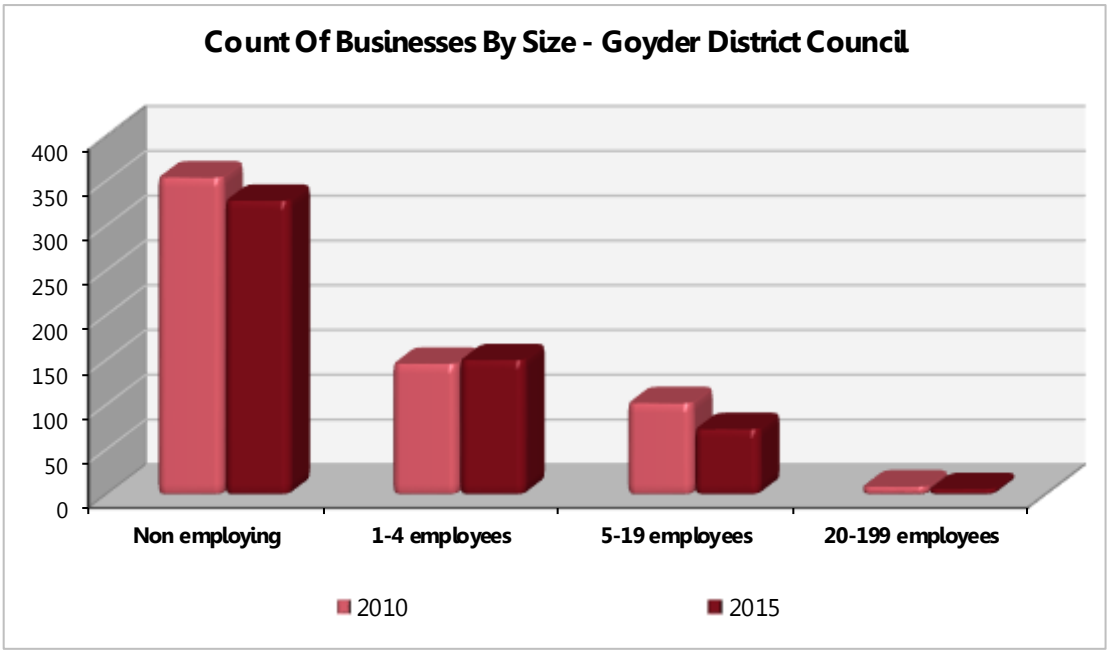


Table 3.11 – Count of Business by Industry and Size in Goyder LGA, 2010 – 2015

	4 or less employees			Total		
Industry	**2010**	**2015**	**% change**	**2010**	**2015**	**% change**
Agriculture, Forestry and Fishing	288	285	-1%	366	338	-8%
Construction	41	35	-15%	44	35	-20%
Rental, Hiring & Real Estate Services	32	31	-3%	32	31	-3%
Transport, Postal and Warehousing	31	28	-10%	31	31	+0%
Retail Trade	23	20	-13%	26	26	+0%
Manufacturing	3	10	+233%	9	17	+89%
Accommodation and Food Services	9	10	+11%	15	14	-7%
Prof., Scientific and Technical Services	10	14	+40%	10	14	+40%
Financial and Insurance Services	7	11	+57%	7	11	+57%
Wholesale Trade	9	6	-33%	12	9	-25%
Administrative and Support Services	9	3	-67%	9	3	-67%
Elec., Gas, Water and Waste Services	3	3	+0%	6	3	-50%
Education and Training	0	3	-	0	3	-
Arts and Recreation Services	4	0	-100%	7	0	-100%
Mining	6	0	-100%	6	0	-100%
Health Care and Social Assistance	3	0	-100%	6	0	-100%
Other Services	19	16	-16%	22	19	-14%
Total	*497*	*475*	*-4%*	*608*	*554*	*-9%*

Note: Excludes 'Currently unknown'.
Source: Australian Bureau of Statistics, Counts of Australian Businesses, including Entries and Exits, Cat. No. 8165.0.

Chart 3.1 - Count of Business by Size in Goyder LGA, 2010 – 2015



Source: Australian Bureau of Statistics, Counts of Australian Businesses, including Entries and Exits, Cat. No. 8165.0.

3.5.3 Business Turnover Levels

Table 3.12 and Chart 2.2 compares the change in the number of businesses within the Goyder LGA between 2010 and 2015 by level of turnover and industry division.

Key points to note from Table 5.2 and Chart 5.2 include:

- Nearly a quarter of all businesses within the Goyder LGA had an annual turnover over more than $500,000 (23%), including 5% or 26 businesses with an annual turnover of $2 million or more.

- The number of businesses within turnover ranges between 2010 and 2015 have decreased, with the exception of those businesses with turnover greater than $500,000 per annum.

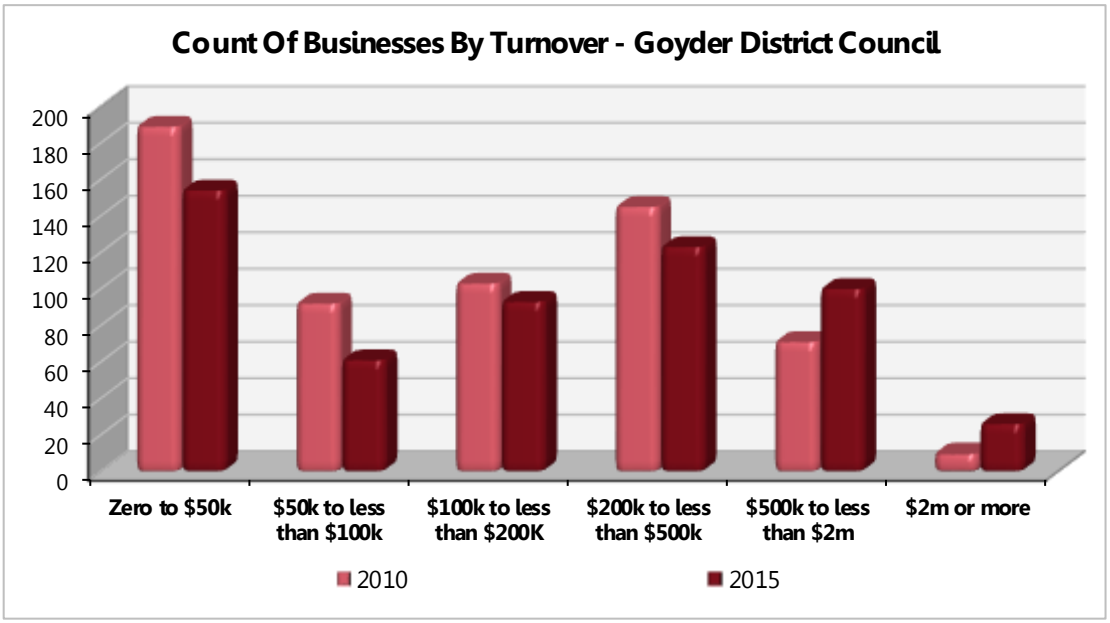
- Agriculture, Forestry and Fishing had the greatest number of businesses in the Goyder LGA with an annual turnover of more than $2 million in 2015 (16 businesses).

Table 3.12 – Count of Business by Industry and Turnover in Goyder LGA, 2010 – 2015

	$200k+ turnover			Total		
Industry	**2010**	**2015**	**% change**	**2010**	**2015**	**% change**
Agriculture, Forestry and Fishing	132	163	+23%	358	337	-6%
Construction	7	12	+71%	36	37	+3%
Rental, Hiring & Real Estate Services	6	7	+17%	29	32	+10%
Transport, Postal and Warehousing	19	13	-32%	38	30	-21%
Retail Trade	23	18	-22%	42	25	-40%
Manufacturing	6	9	+50%	14	15	+7%
Prof., Scientific and Technical Services	3	4	+33%	9	15	+67%
Accommodation and Food Services	12	6	-50%	21	14	-33%
Financial and Insurance Services	0	0	-	5	11	+120%
Wholesale Trade	6	6	+0%	12	6	-50%
Administrative and Support Services	0	0	-	6	3	-50%
Elec., Gas, Water and Waste Services	0	0	-	3	3	+0%
Mining	0	3	-	0	3	-
Public Administration and Safety	0	0	-	0	3	-
Education and Training	0	0	-	0	3	-
Arts and Recreation Services	0	0	-	7	0	-100%
Health Care and Social Assistance	0	0	-	3	0	-100%
Other Services	6	8	+33%	15	17	+13%
Total	*220*	*249*	*+13%*	*598*	*554*	*-7%*

Note: Excludes 'Currently unknown'.
Source: Australian Bureau of Statistics, Counts of Australian Businesses, including Entries and Exits, Cat. No. 8165.0.

Chart 3.2 - Count of Business by Turnover in Goyder LGA, 2010 – 2015



Source: Australian Bureau of Statistics, Counts of Australian Businesses, including Entries and Exits, Cat. No. 81

3.6 TOWNSHIP SERVICES

In addition to accommodation, workers locating temporarily to the Study Area will require a wide range of other convenience services, and the project will also need to source trade and other services from businesses located in the immediate region. This section provides an overview of the services located in the main townships in the Goyder region of the Study Area.

The Regional Council Goyder contains the townships of Burra, Eudunda, Hallett, Robertstown, and Terowie, in addition to a number of smaller localities.

Burra (154 kilometres north east of Adelaide) and Eudunda (103 kilometres north east of Adelaide) serve as the major service centres for the region and, in addition to Kapunda, will be sources of services available to support the proposed wind farm project. Burra is located approximately 70 kilometres north of the project site, while Eudunda is located approximately 20 kilometres north east of the site.

Burra offers a range of regional services including:

- Accommodation options including country hotel, motor inn, caravan park and self-contained cottages.
- Home hardware (Thrifty-Link).
- Hotels (5 including mount Bryan).
- Restaurants and cafes.
- Major banks and postal services.
- Medical and emergency services (Kapunda Hospital and medical practices).
- Main street retail.
- Automotive and mechanical services.
- Tourism and related services in Burra and the surrounding region.

- Recreation facilities including the Burra Regional Art Gallery, Golf Course, Swimming Pool, Lawn Bowls and Tennis Courts, Walking and Cycling Trails

Eudunda offers a range of regional services including:

- Accommodation options including country hotel (Eudunda and Light), motel and bed and breakfast.
- Hotels (2 – Eudunda and Light).
- Bank (1) and postal services.
- Hardware services.
- Main street retail and café services.
- Main street retail.
- Automotive and mechanical services.
- Tourism and related services in Eudunda and the surrounding region.
- Recreation facilities including Health and Fitness Centre, Swimming Pool, 9-Hole Golf Course and Walking Trails.

4 ECONOMIC IMPACT ASSESSMENT

The objectives of the economic impact assessment include:

- An economic assessment of the Twin Creek Wind Farm Project in terms of economic benefits to local communities of the LGA's of Goyder and Light, the broader region of Barossa and Lower North (ASBS regions) and also to the state of South Australia. It is recognised that transmission lines will travel through the Mid Murray Council region (to Truro) but there will be little socio economic impact on this region.

- An assessment of the associated benefits of offsetting carbon by displacing the need for further non-renewable generation development, such as coal or gas fired power stations.

In addition to the above, consideration is given in this assessment to the potential impact of the project on local property values.

This paper does not consider the impact of investment and supply conditions for renewable energies on the underlying energy market and prices. This is a complex issue and beyond the scope of this project.

4.1 Project Assumptions

The economic modelling undertaken for this project is based on the following expenditure estimates supplied by the project proponent for construction and operation of the Twin Creek Wind Farm. These figures are indicative estimates for the purposes of an economic assessment:

- Total wind farm capacity of 183 megawatts.

- Total construction cost of $2 million per megawatt - $350 million apportioned over 3 years as follows:

    - Year 1 – 30%
    - Year 2 – 45%
    - Year 3 – 25%

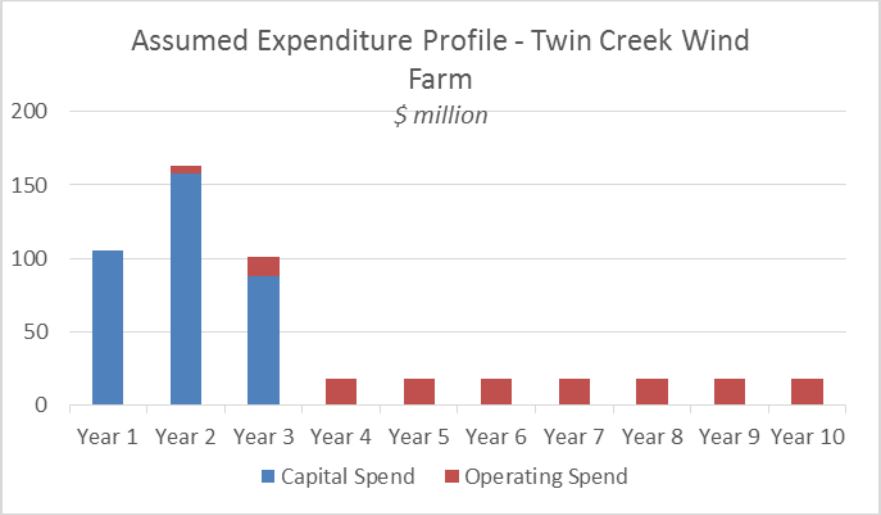
- The total construction cost of $350 million includes all construction and associated works, with assumptions as to the nature of the spend based on other studies undertaken by Hudson Howells as follows:

    - WTG supply & install (%) - 65.0%
    - U/g reticulation (%) - 6.0%
    - Civil works - 7.5%
    - Substation (%) - 6.0%
    - Network connection (%) - 14.0%
    - O&M compound & car parking (%) - 1.5%

- Annual operating costs assuming average utilisation are based on $103 per megawatt hour - $18.03 million per annum.

An indicative time line of the expenditure profile is provided in Chart 4.1 below.

Chart 4.1



4.2 Broad Project Methodology

This economic impact assessment focuses on the effect of the Twin Creek Wind Farm Project on regional and local incomes and employment associated with the construction and operating phases of the project. This effect arises through the primary expenditure directly associated with the project, and then from further 'rounds' of indirect expenditure that this direct expenditure stimulates as it flows to supplying industries and into incomes and consumption.

The importance of the construction and operating expenditure identified above is that it will sustain turnover in local industry and will support local jobs and incomes. The use of economic impact assessments based on State and Regional Input Output Tables has been a prominent process[10] for translating directly created expenditure (a final demand stimulus) into jobs and incomes, and for establishing the extent of the flow-on impacts. Overall the methodology used here is similar that which has been used internationally in other jurisdictions to look at regional economic impacts of wind farms[11].

The use of these Input Output tables allows an assessment of the impact of a certain event or events (in this case the Twin Creek Wind Farm Project) on the incomes (value added or Gross State/Regional Product) and employment of a specified region or regions. This is consistent with national accounting frameworks.

The assessment for this project looks at the impact across 4 regions:

- The local impact – measured in terms of the contribution in the LGA's of Goyder and Light individually.

- The broader region, as defined by the ABS in its regional definitions of Barossa and Lower North.

- The state of South Australia – it should be noted that this region is inclusive of the regions above and the estimates of economic activity in the region are not additive to that of the state.

Table 4.1 illustrates the employment base of these regions, as estimated by the ABS (2011 census –place of work data), while Table 4.2 shows the proportional shares of employment by industry.

[10] Alternative economy wide models are available, including econometric models or CGE models. Input-Output models are general equilibrium models in that the impacts of one sector are considered across the broader economy, but they assume infinite elasticity of supply. The other models include the impact of resource constraints (under varying assumptions). The evidence suggests that at the regional and state geographic levels such constraints are minimal in a long run perspective – as capital and labour can flow relatively easily across borders, and as such input output provides an appropriate methodology.

[11] See for example Michael C. Slattery, Eric Lantz , Becky L. Johnson State and Local Economic Impacts from Wind Energy Projects: Texas Case Study, Energy Policy 39 (2011) 7930–7940

Table 4.1 - Employment by Industry and Region

	Light LGA	Goyder LGA	Total - Light and Goyder	Barossa/ Lower North	Sth Aust
Agriculture, Forestry and Fishing	682	442	1,124	3,624	27,675
Mining	27	5	32	112	9,205
Manufacturing	814	129	943	4050	76,386
Electricity, Gas, Water and Waste Services	17	32	49	179	9,832
Construction	264	48	312	897	53,574
Wholesale Trade	112	21	133	590	25,427
Retail Trade	177	120	297	1960	81,845
Accommodation and Food Services	199	72	271	1502	45,110
Transport, Postal and Warehousing	208	34	242	764	29,762
Information Media and Telecommunications	22	5	27	125	10,480
Financial and Insurance Services	20	7	27	257	21,903
Rental, Hiring and Real Estate Services	29	0	29	142	9,354
Professional, Scientific and Technical Services	125	25	150	504	40,133
Administrative and Support Services	53	24	77	640	24,696
Public Administration and Safety	92	44	136	684	51,712
Education and Training	456	113	569	1497	58,201
Health Care and Social Assistance	241	95	336	2091	99,275
Arts and Recreation Services	21	4	25	159	9,202
Other Services	121	39	160	624	28,499
Inadequately described	32	4	36	132	6,513
Not stated	3	0	3	14	440
Not applicable	0	0	0	0	0
Total	3,715	1,263	4,978	20,547	719,224

Source: ABS Census 2011 (from ABS Web-site)

Table 4.2 - Share of Employment by Industry and Region

	Light LGA	Goyder (DC)	Total - Light and Goyder	Barossa/ Lower North	Sth Aust
Agriculture, Forestry and Fishing	18.4%	35.0%	22.6%	17.6%	3.8%
Mining	0.7%	0.4%	0.6%	0.5%	1.3%
Manufacturing	21.9%	10.2%	18.9%	19.7%	10.6%
Electricity, Gas, Water and Waste Services	0.5%	2.5%	1.0%	0.9%	1.4%
Construction	7.1%	3.8%	6.3%	4.4%	7.4%
Wholesale Trade	3.0%	1.7%	2.7%	2.9%	3.5%
Retail Trade	4.8%	9.5%	6.0%	9.5%	11.4%
Accommodation and Food Services	5.4%	5.7%	5.4%	7.3%	6.3%
Transport, Postal and Warehousing	5.6%	2.7%	4.9%	3.7%	4.1%
Information Media and Telecommunications	0.6%	0.4%	0.5%	0.6%	1.5%
Financial and Insurance Services	0.5%	0.6%	0.5%	1.3%	3.0%
Rental, Hiring and Real Estate Services	0.8%	0.0%	0.6%	0.7%	1.3%
Professional, Scientific and Technical Services	3.4%	2.0%	3.0%	2.5%	5.6%
Administrative and Support Services	1.4%	1.9%	1.5%	3.1%	3.4%
Public Administration and Safety	2.5%	3.5%	2.7%	3.3%	7.2%
Education and Training	12.3%	8.9%	11.4%	7.3%	8.1%
Health Care and Social Assistance	6.5%	7.5%	6.7%	10.2%	13.8%
Arts and Recreation Services	0.6%	0.3%	0.5%	0.8%	1.3%
Other Services	3.3%	3.1%	3.2%	3.0%	4.0%
Inadequately described	0.9%	0.3%	0.7%	0.6%	0.9%
Not stated	0.1%	0.0%	0.1%	0.1%	0.1%
Not applicable	0.0%	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: ABS Census 2011 (Sourced from ABS Web-site)

The analysis develops estimates of economic impact for the regions based on indicative input-output tables developed for the regions above. These tables at the state level have been derived using the 2011/12 South Australian input output table as prepared for the State Government[12], and using the location quotient method (based on regional employment data for the relevant regions from the 2011 Census), adjusting for inflation. The tables for the Barossa and Lower North region also used the location quotient method, but are derived from the combined Barossa and Yorke and Mid North table from the RISE model, while the local table is based (using the location quotient method) on the regional table.

12 The RISE MODEL, as presented in Input-Output Tables for South Australia and its Regions 2011/12 Update: Technical Report A report to Department of the Premier and Cabinet, Prepared by EconSearch Pty Ltd, May 2013.

4.3 Economic Assessment

This section details the economic impact assumptions and findings of the project assuming certain levels of direct supply from local industry. It is assumed that a significant component of the equipment is imported and much of the local spend being on transport and assembly.

4.3.1 Core Assumptions

Tables 4.3 and 4.4 below show the assumptions for capital and operating expenditure by category and source. The assumed distributions are based on the nature of the spend and specific assumptions regarding the expenditure profiles for the state, region and LGAs. It should be noted that the major assumption that impacts economic outcomes is the percentage of imported material. The distribution of local product to other sectors is not as critical (in an order of magnitude perspective).

Table 4.3 presents the assumptions in terms of the broad basis of expenditure (i.e. nature of expenditure). The payment to labour is also assumed to include commercial arrangements with respect to landowners impacted by the project – currently 24 landowners, 3 with wind turbine infrastructure (with 25 year lease payments), 6 with access roads (with 25 year lease payments), 14 with transmission lines (one off payment to purchase easement) and a $50,000 per annum voluntary community fund for each year of operation inflated with CPI (expected to be 25 years). The spend of the $350 million that occurs in the areas (including the state) is higher than some other studies as the project involves maximizing the commitment to local supply. The capital spend is $350 million. It is assumed that 15% of that will be spent in each of the local areas – some to construction contractors, some to light metal manufacturing, some to transport but most ($35 million over three years) to labour in the construction process. While the project mostly sits in the Light area, it is assumed that it will draw labour and services/inputs from across the two councils.

Table 4.4 extends the detail of the distribution to match the 18 sector Input Output Tables that have been developed for this project. The spend of labour wages and salaries is distributed based on the average consumption vector. The table also involves the conversion of these values from purchasers' prices to basic prices, as the raw data for construction etc. includes margins, taxes and subsidies. All monetary values in Input Output models are expressed as basic values. The prime differences between purchaser prices and basic values are that:

- Basic values exclude the cost of transport and wholesale and retail trade embedded in the purchase price (and allocate these to the transport and trade sectors).

- GST will be allocated to Gross Operating Surplus

The core assumptions to make the adjustments from purchaser price distributions to basic values are:

- The average value added in each of the industry sectors is extracted and then the GST component (at 10% - which is only paid on the value added) is deducted and separately identified – assumed to be spent equally on public administration, health and education.

- The purchaser price is adjusted for the average margin for wholesale, retail and transport sectors, as identified in national Input Output tables.

Table 4.3 - Assumed Expenditure Distributions

	Capital				Operating			
	Goyder	Light	Region	State	Goyder	Light	Region	State
Building Construction	2.0%	2.0%	7.5%	15.0%	2.0%	2.0%	10.0%	15.0%
Fabricated metals	1.0%	1.0%	5.0%	10.0%	1.0%	1.0%	5.0%	5.0%
Transport	2.0%	2.0%	5.0%	10.0%	2.0%	2.0%	2.5%	2.5%
Spend of Labour	10.0%	10.0%	25.0%	30.0%	30.0%	25.0%	65.0%	70.0%
Imports	85.0%	85.0%	57.5%	35.0%	65.0%	70.0%	17.5%	7.5%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Assumptions

Table 4.4 - Assumed Expenditure Distributions in Basic Values

	Capital Spend				Operating Spend			
	Goyder	Light	Region	State	Goyder	Light	Region	State
Agriculture, Forestry and Fishing	0.1%	0.1%	0.2%	0.3%	0.2%	0.2%	0.5%	0.7%
Mining	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.3%
Manufacturing	1.2%	1.5%	6.0%	12.8%	1.7%	2.3%	8.1%	12.8%
Electricity, Gas, Water and Waste Services	0.1%	0.1%	0.3%	0.7%	0.3%	0.1%	0.7%	1.7%
Construction	1.9%	1.9%	7.0%	14.1%	1.9%	1.9%	9.4%	14.1%
Wholesale Trade	0.3%	0.4%	1.2%	2.2%	0.5%	0.7%	1.9%	4.3%
Retail Trade	0.6%	0.3%	1.6%	2.7%	1.8%	0.8%	4.1%	6.2%
Accommodation and Food Services	0.3%	0.3%	1.1%	1.6%	1.0%	0.8%	3.0%	3.7%
Transport, Postal & Warehousing	2.0%	2.0%	5.1%	10.8%	2.2%	2.2%	3.3%	4.8%
Information Media & Telecommunications	0.1%	0.1%	0.2%	0.9%	0.2%	0.2%	0.6%	2.0%
Finance and Insurance Services	0.1%	0.1%	0.4%	1.7%	0.2%	0.2%	1.2%	4.0%
Ownership of Dwellings	1.4%	1.4%	3.4%	4.0%	4.1%	3.4%	8.9%	9.4%
Property and Business Services	0.0%	0.0%	0.1%	0.3%	0.1%	0.1%	0.4%	0.7%
Public Administration & Safety	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.5%
Education & Training	0.3%	0.3%	0.7%	1.1%	0.8%	0.7%	1.8%	2.5%
Health care and social assistance	0.2%	0.2%	0.8%	1.4%	0.7%	0.5%	1.8%	2.5%
Arts and recreation services	0.0%	0.1%	0.2%	0.5%	0.1%	0.1%	0.5%	1.2%
Other Services	0.1%	0.1%	0.3%	0.7%	0.4%	0.3%	0.8%	1.7%
GST	0.4%	0.4%	1.3%	1.9%	1.2%	1.0%	3.1%	2.6%
Total	**9.1%**	**9.2%**	**30.1%**	**58.1%**	**17.4%**	**15.5%**	**49.9%**	**75.8%**

Source: Assumptions

4.3.2 Modelling Results – State Level Outcomes

Tables 4.5 – 4.7 below show the results of using the resultant expenditure distribution as an exogenous shock to the Input Output Table for South Australia with the aggregated expenditures, in the context that they would represent an increase in final demand[13], and distributed as per Table 4.4 through the Input Output Table. Tables 4.5 and 4.6 show the detailed outcomes – with the level of activity generated by industry sector. Table 4.7 provides a summary of the outcomes.

The modelling indicates that the project will generate $209 million of value added[14] (incomes created or contribution to Gross State Product) in the State of South Australia over the period of construction and that this would happen over three years (allowing for lagged flow through effects). 1,447 person years[15] of employment would be supported – or an average of 480 jobs sustained per year over three years. Once operational the project is estimated to support annually $15.5 million of incomes, and support directly and indirectly of the order of 105 jobs per year.

[13] This analysis assesses the contribution of the project in isolation. It does not compare the project with other possible projects, and nor does it investigate the change in expenditure levels at existing energy providers, as this project takes on market share – although this is expected to be negligible given the fixed cost context of the industry.
[14] Contribution to Gross State or Regional Product (GSP/GRP) – and defined as the returns to labour and the returns to capital as per the national accounting framework.
[15] Person years are the number of full time annual job equivalents over the period of construction

Table 4.5 - Estimates of Economic Activity by Sector Related to Aggregate Capital Spend for South Australia – Outcomes Over Life of Project

(Note employment should be interpreted as person years of employment rather than number of jobs at a point of time - See earlier definitions of person years of employment)

	Expend-iture ($m)	Value Added ($m)			Income ($m)			Employment (FTE's)		
		Direct	Induced	Total	Direct	Induced	Total	Direct	Induced	Total
Agriculture, Forestry and Fishing	$1.07	$0.49	$5.68	$6.18	$0.16	$1.90	$2.07	3	38	42
Mining	$0.46	$0.29	$3.32	$3.61	$0.06	$0.68	$0.74	1	14	15
Manufacturing	$44.94	$12.84	$12.89	$25.73	$8.69	$8.72	$17.41	115	116	231
Electricity, Gas, Water and Waste Services	$2.57	$1.10	$4.60	$5.70	$0.38	$1.60	$1.98	4	18	22
Construction	$49.24	$12.65	$4.81	$17.46	$10.93	$4.16	$15.09	109	42	151
Wholesale Trade	$7.85	$3.63	$6.64	$10.27	$2.34	$4.28	$6.62	17	32	49
Retail Trade	$9.46	$5.38	$8.36	$13.74	$3.83	$5.95	$9.79	71	111	182
Accommodation and Food Services	$5.57	$2.27	$3.98	$6.25	$1.59	$2.78	$4.36	30	53	83
Transport, Postal & Warehousing	$37.80	$15.96	$7.11	$23.08	$10.34	$4.61	$14.94	117	52	169
Information Media & Telecommunications	$3.06	$1.50	$5.46	$6.96	$0.46	$1.68	$2.14	6	22	29
Finance and Insurance Services	$6.02	$4.05	$19.41	$23.46	$1.87	$8.97	$10.84	9	44	53
Ownership of Dwellings	$14.10	$10.74	$14.25	$24.98	$0.00	$0.00	$0.00	0	0	0
Property and Business Services	$1.06	$0.44	$17.60	$18.04	$0.35	$13.06	$13.40	4	137	140
Public Administration & Safety	$0.78	$0.41	$2.00	$2.41	$0.34	$1.62	$1.96	4	20	24
Education & Training	$3.77	$2.73	$4.26	$7.00	$2.51	$3.91	$6.42	31	49	80
Health care and social assistance	$4.77	$3.14	$4.31	$7.45	$2.94	$4.03	$6.97	37	51	88
Arts and recreation services	$1.80	$0.67	$1.10	$1.77	$0.57	$0.94	$1.51	6	9	15
Other Services	$2.48	$1.21	$3.75	$4.96	$1.10	$3.42	$4.52	18	56	73
Total	**$196.79**	**$79.53**	**$129.53**	**$209.06**	**$48.46**	**$72.30**	**$120.76**	**584**	**862**	**1,447**

Source: Modelled Result

Table 4.6 - Estimates of Annual Economic Activity by Sector Related to Operating Spend for South Australia

	Expend-iture ($m)	Value Added ($m)			Income ($m)			Employment (FTE's)		
		Direct	Induced	Total	Direct	Induced	Total	Direct	Induced	Total
Agriculture, Forestry and Fishing	$0.14	$0.06	$0.37	$0.44	$0.02	$0.12	$0.15	0.4	2.5	2.9
Mining	$0.06	$0.04	$0.21	$0.25	$0.01	$0.04	$0.05	0.2	0.9	1.1
Manufacturing	$2.45	$0.70	$0.94	$1.64	$0.47	$0.64	$1.11	6.3	8.4	14.7
Electricity, Gas, Water and Waste Services	$0.33	$0.14	$0.33	$0.47	$0.05	$0.11	$0.16	0.6	1.3	1.8
Construction	$2.69	$0.69	$0.36	$1.05	$0.60	$0.31	$0.91	6.0	3.1	9.1
Wholesale Trade	$0.82	$0.38	$0.44	$0.82	$0.24	$0.28	$0.53	1.8	2.1	3.9
Retail Trade	$1.19	$0.67	$0.62	$1.29	$0.48	$0.44	$0.92	9.0	8.2	17.2
Accommodation and Food Services	$0.71	$0.29	$0.27	$0.56	$0.20	$0.19	$0.39	3.8	3.6	7.5
Transport, Postal & Warehousing	$0.91	$0.38	$0.45	$0.83	$0.25	$0.29	$0.54	2.8	3.3	6.1
Information Media & Telecommunications	$0.39	$0.19	$0.39	$0.58	$0.06	$0.12	$0.18	0.8	1.6	2.4
Finance and Insurance Services	$0.77	$0.52	$1.45	$1.97	$0.24	$0.67	$0.91	1.2	3.3	4.5
Ownership of Dwellings	$1.80	$1.37	$0.99	$2.36	$0.00	$0.00	$0.00	0.0	0.0	0.0
Property and Business Services	$0.14	$0.06	$1.18	$1.24	$0.04	$0.92	$0.97	0.5	9.7	10.1
Public Administration & Safety	$0.10	$0.05	$0.13	$0.18	$0.04	$0.10	$0.15	0.5	1.3	1.8
Education & Training	$0.48	$0.35	$0.30	$0.65	$0.32	$0.27	$0.59	4.0	3.4	7.4
Health care and social assistance	$0.48	$0.32	$0.30	$0.62	$0.30	$0.28	$0.58	3.8	3.5	7.3
Arts and recreation services	$0.23	$0.09	$0.08	$0.16	$0.07	$0.07	$0.14	0.7	0.7	1.4
Other Services	$0.32	$0.15	$0.23	$0.39	$0.14	$0.21	$0.35	2.3	3.4	5.7
Total	**$13.99**	**$6.45**	**$9.04**	**$15.49**	**$3.54**	**$5.08**	**$8.62**	**44.5**	**60.3**	**104.8**

Source: Modelled Result

Table 4.7 - Estimates of Economic Activity for South Australia

	Total GSP Impact (3 yrs)	Average Annual GSP Impact	Total Jobs Impact (Person Years - over 3 yrs)	Average Annual Jobs Impact
Construction Phase				
Direct	$79.5 million	$26.5 million	584	195
Indirect	$129.5 million	$43.2 million	862	287
Total	*$209.1 million*	*$69.7 million*	*1,447*	*482*
Operating Phase				
Direct		$6.5 million		45
Indirect		$9 million		60
Total		*$15.5 million*		*105*

Source: Modelled Result

**Full Time Equivalent Jobs*

Note – these numbers are rounded versions of the numbers in the tables above, as the modelling should be interpreted in terms of order of magnitude, but it means that not all numbers are exactly additive.

It should be noted that the impact at the national level would be similar to that estimated for the State level, unless there are constraints in national labour and capital markets. Such constraints would reduce the level of impact, with the project drawing resources into South Australia and out of other states. If such constraints existed (i.e. at extended times with very low unemployment rates, or where the project might have significant effects on exchange rates) the national outcomes would be best modelled using a CGE model to allow for those constraints, but in the context of the current national economy, it is reasonable to assume the constraints are not severe

4.3.3 Modelling Results – Barossa-Lower North Region Outcomes

Tables 4.8 – 4.10 below show the results of applying the regional expenditures as per Table 4.4 above to the regional Input Output Table for the Barossa-Lower North Region. It should be noted these results are inclusive in the South Australia results.

Tables 4.8 and 4.9 show the detailed outcomes with the level of activity generated by industry sector, while Table 4.10 provides a summary of the outcomes.

From a regional perspective, the modelling indicates that the project will generate $64 million of value added (incomes created or contribution to Gross Regional Product) in the region over the period of construction and, again allowing for lagged flow through effects, this would happen over three years. 477 person years of employment would be supported, or again an average of 159 jobs sustained per year over three years. Once operational the project is estimated to support annually $6.2 million of incomes in the region, and support directly and indirectly (including the multiplier impact) approximately 44 jobs per year.

Table 4.8 - Estimates of Economic Activity by Sector Related to Aggregate Capital Spend for the Barossa-Lower North Region – Outcomes Over Life of Project

(Note that employment should be interpreted as person years of employment rather than number of jobs at a point of time)

	Expend-iture ($m)	Value Added ($m)			Income ($m)			Employment (FTE's)		
		Direct	Induced	Total	Direct	Induced	Total	Direct	Induced	Total
Agriculture, Forestry and Fishing	$0.61	$0.28	$1.44	$1.73	$0.08	$0.41	$0.49	1.9	9.7	11.6
Mining	$0.00	$0.00	$0.06	$0.06	$0.00	$0.03	$0.03	0.0	1.0	1.0
Manufacturing	$20.98	$5.62	$1.58	$7.20	$3.17	$0.89	$4.06	38.3	10.7	49.0
Electricity, Gas, Water and Waste Services	$0.88	$0.38	$0.77	$1.15	$0.14	$0.28	$0.41	1.8	3.7	5.5
Construction	$24.62	$6.25	$0.75	$7.00	$5.46	$0.65	$6.11	60.8	7.3	68.1
Wholesale Trade	$4.09	$1.89	$1.32	$3.22	$1.22	$0.85	$2.07	10.0	7.0	17.1
Retail Trade	$5.66	$3.22	$1.69	$4.91	$2.29	$1.20	$3.50	47.8	25.1	72.9
Accommodation and Food Services	$3.99	$1.63	$0.97	$2.60	$1.11	$0.66	$1.76	23.8	14.1	37.9
Transport, Postal & Warehousing	$18.00	$7.61	$1.46	$9.07	$5.09	$0.98	$6.06	65.2	12.5	77.8
Information Media & Telecommunications	$0.87	$0.45	$0.47	$0.91	$0.14	$0.15	$0.29	2.2	2.2	4.4
Finance and Insurance Services	$1.57	$1.08	$2.19	$3.28	$0.46	$0.92	$1.38	2.7	5.4	8.1
Ownership of Dwellings	$11.99	$9.13	$4.19	$13.32	$0.00	$0.00	$0.00	0.0	0.0	0.0
Property and Business Services	$0.48	$0.20	$2.20	$2.40	$0.16	$1.70	$1.86	1.9	19.8	21.7
Public Administration & Safety	$0.06	$0.03	$0.20	$0.23	$0.03	$0.16	$0.19	0.4	2.3	2.7
Education & Training	$2.43	$1.76	$0.93	$2.69	$1.62	$0.85	$2.47	22.7	11.9	34.6
Health care and social assistance	$2.94	$1.95	$0.91	$2.86	$1.83	$0.86	$2.69	26.2	12.3	38.6
Arts and recreation services	$0.71	$0.30	$0.17	$0.47	$0.24	$0.13	$0.37	2.8	1.5	4.3
Other Services	$1.11	$0.49	$0.71	$1.20	$0.45	$0.65	$1.10	9.0	13.1	22.1
Total	**$100.98**	**$42.29**	**$22.00**	**$64.29**	**$23.48**	**$11.38**	**$34.86**	**317.6**	**159.8**	**477.4**

Source: Modelled Result

Table 4.9 - Estimates of Annual Economic Activity by Sector Related to Operating Spend for the Barossa-Lower North Region

	Expend-iture ($m)	Value Added ($m)			Income ($m)			Employment (FTE's)		
		Direct	Induced	Total	Direct	Induced	Total	Direct	Induced	Total
Agriculture, Forestry and Fishing	$0.09	$0.01	$0.15	$0.16	$0.00	$0.05	$0.05	0.3	0.8	1.1
Mining	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.0	0.1	0.1
Manufacturing	$1.55	$0.34	$0.24	$0.58	$0.00	$0.33	$0.33	2.8	1.1	4.0
Electricity, Gas, Water and Waste Services	$0.12	$0.04	$0.09	$0.12	$0.00	$0.04	$0.04	0.3	0.3	0.6
Construction	$1.80	$0.73	-$0.18	$0.55	$0.00	$0.47	$0.48	4.4	0.9	5.3
Wholesale Trade	$0.36	$0.10	$0.17	$0.27	$0.00	$0.18	$0.18	0.9	0.6	1.5
Retail Trade	$0.78	$0.22	$0.39	$0.61	$0.00	$0.43	$0.43	6.6	2.4	9.0
Accommodation and Food Services	$0.57	$0.09	$0.22	$0.31	$0.00	$0.21	$0.21	3.4	1.2	4.6
Transport, Postal & Warehousing	$0.62	$0.18	$0.19	$0.37	$0.00	$0.25	$0.25	2.3	0.9	3.2
Information Media & Telecommunications	$0.12	$0.00	$0.11	$0.11	$0.00	$0.03	$0.03	0.3	0.2	0.5
Finance and Insurance Services	$0.22	$0.08	$0.30	$0.37	$0.00	$0.16	$0.16	0.4	0.5	0.9
Ownership of Dwellings	$1.70	$0.76	$0.90	$1.66	$0.00	$0.00	$0.00	0.0	0.0	0.0
Property and Business Services	$0.07	$0.05	$0.17	$0.21	$0.00	$0.17	$0.17	0.3	1.7	2.0
Public Administration & Safety	$0.01	$0.01	$0.01	$0.02	$0.00	$0.02	$0.02	0.1	0.2	0.2
Education & Training	$0.34	$0.12	$0.21	$0.33	$0.00	$0.30	$0.30	3.2	1.0	4.3
Health care and social assistance	$0.35	$0.14	$0.17	$0.31	$0.00	$0.29	$0.29	3.1	1.1	4.2
Arts and recreation services	$0.10	$0.01	$0.05	$0.06	$0.00	$0.05	$0.05	0.4	0.1	0.5
Other Services	$0.16	$0.00	$0.12	$0.12	$0.00	$0.11	$0.11	1.3	0.9	2.2
Total	**$8.96**	**$2.88**	**$3.29**	**$6.16**	**$0.02**	**$3.07**	**$3.09**	**29.9**	**14.1**	**44.0**

Source: Modelled Result

Table 4.10 - Estimates of Economic Activity for the Barossa-Lower North Region

	Total GSP Impact (3 yrs)	Average Annual GSP Impact	Total Jobs Impact (Person Years - over 3 yrs)	Average Annual Jobs Impact
Construction Phase				
Direct	$42.3 million	$14.1 million	318	106
Indirect	$22 million	$7.3 million	160	53
Total	*$64.3 million*	*$21.4 million*	*477*	*159*
Operating Phase				
Direct		$2.9 million		30
Indirect		$3.3 million		14
Total		*$6.2 million*		*44*

Source: Modelled Result

Note – these numbers are rounded versions of the numbers in the tables above, as the modelling should be interpreted in terms of order of magnitude, but it means that not all numbers are exactly additive.

4.3.4 Modelling Results – LGA's of Goyder and Light

Tables 4.11 – 4.13 below show the results of applying the expenditures (as per Table 4.4) above to the local Input Output Table for the Regional Council of Goyder, while Tables 4.14 – 4.16 show the results for the Light Regional Council. Tables 4.11 and 4.12, and 4.14 and 4.15

show the detailed outcomes with the level of activity generated by industry sector, while Tables 4.13 and 4.16 provide a summary of the outcomes.

From a local perspective in the Regional Council of Goyder, the modelling indicates that the project will generate $18 million of value added (incomes created or contribution to Gross Regional Product), directly in the transport sector, but also a result of the impact of direct labour supplied. This occurs over the period of construction and, again allowing for lagged flow through effects, this would happen over three years. 130 person years of employment would be supported, or an average of 43 jobs sustained per year over three years. Once operational the project is estimated to support annually $1.8 million of incomes in the region, and support directly and indirectly (including the multiplier impact) approximately 12 jobs per year.

Table 4.11 - Estimates of Economic Activity by Sector Related to Aggregate Capital Spend for the Regional Council of Goyder – Outcomes Over Life of Project

(Note that employment should be interpreted as person years of employment rather than number of jobs at a point of time)

	Expend-iture ($m)	Value Added ($m)			Income ($m)			Employment (FTE's)		
		Direct	Induced	Total	Direct	Induced	Total	Direct	Induced	Total
Agriculture, Forestry and Fishing	$0.25	$0.11	$0.33	$0.44	$0.03	$0.09	$0.13	0.8	2.2	3.0
Mining	$0.00	$0.00	$0.01	$0.01	$0.00	$0.01	$0.01	0.0	0.1	0.2
Manufacturing	$5.12	$1.37	$0.24	$1.61	$0.77	$0.14	$0.91	9.3	1.6	11.0
Electricity, Gas, Water and Waste Services	$0.18	$0.08	$0.19	$0.27	$0.03	$0.07	$0.10	0.4	0.9	1.3
Construction	$6.57	$1.67	$0.25	$1.92	$1.46	$0.22	$1.67	16.2	2.4	18.7
Wholesale Trade	$1.47	$0.68	$0.20	$0.88	$0.44	$0.13	$0.56	3.6	1.0	4.6
Retail Trade	$1.14	$0.65	$0.50	$1.16	$0.46	$0.36	$0.82	9.7	7.5	17.2
Accommodation and Food Services	$1.14	$0.47	$0.19	$0.66	$0.32	$0.13	$0.44	6.8	2.8	9.6
Transport, Postal & Warehousing	$7.14	$3.01	$0.28	$3.30	$2.02	$0.19	$2.21	25.9	2.4	28.3
Information Media & Telecommunications	$0.33	$0.17	$0.08	$0.25	$0.05	$0.02	$0.08	0.8	0.4	1.2
Finance and Insurance Services	$0.26	$0.18	$0.26	$0.44	$0.08	$0.11	$0.19	0.5	0.7	1.1
Ownership of Dwellings	$4.80	$3.65	$1.11	$4.76	$0.00	$0.00	$0.00	0.0	0.0	0.0
Property and Business Services	$0.17	$0.00	$0.41	$0.41	$0.06	$0.28	$0.34	0.7	3.3	3.9
Public Administration & Safety	$0.02	$0.01	$0.06	$0.07	$0.01	$0.05	$0.06	0.1	0.7	0.8
Education & Training	$0.97	$0.52	$0.43	$0.95	$0.65	$0.23	$0.87	9.1	3.2	12.2
Health care and social assistance	$0.73	$0.53	$0.12	$0.66	$0.45	$0.16	$0.62	6.5	2.3	8.8
Arts and recreation services	$0.20	$0.13	-$0.03	$0.10	$0.07	$0.01	$0.08	0.8	0.2	1.0
Other Services	$0.44	$0.19	$0.22	$0.41	$0.18	$0.19	$0.37	3.6	3.9	7.5
Total	**$30.92**	**$13.43**	**$4.86**	**$18.29**	**$7.07**	**$2.38**	**$9.45**	**94.7**	**35.6**	**130.3**

Source: Modelled Result

Table 4.12 - Estimates of Annual Economic Activity by Sector Related to Operating Spend for the Regional Council of Goyder

	Expend-iture ($m)	Value Added ($m)			Income ($m)			Employment (FTE's)		
		Direct	Induced	Total	Direct	Induced	Total	Direct	Induced	Total
Agriculture, Forestry and Fishing	$0.03	$0.02	$0.03	$0.04	$0.00	$0.01	$0.01	0.1	0.2	0.3
Mining	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.0	0.0	0.0
Manufacturing	$0.43	$0.12	$0.02	$0.14	$0.07	$0.01	$0.08	0.8	0.1	0.9
Electricity, Gas, Water and Waste Services	$0.02	$0.01	$0.02	$0.03	$0.00	$0.01	$0.01	0.1	0.1	0.1
Construction	$0.36	$0.09	$0.02	$0.11	$0.08	$0.02	$0.09	0.9	0.2	1.1
Wholesale Trade	$0.13	$0.06	$0.02	$0.08	$0.04	$0.01	$0.05	0.3	0.1	0.4
Retail Trade	$0.15	$0.08	$0.04	$0.13	$0.06	$0.03	$0.09	1.3	0.6	1.9
Accommodation and Food Services	$0.16	$0.06	$0.02	$0.08	$0.04	$0.01	$0.05	0.9	0.2	1.2
Transport, Postal & Warehousing	$0.42	$0.18	$0.02	$0.20	$0.12	$0.01	$0.13	1.5	0.2	1.7
Information Media & Telecommunications	$0.05	$0.02	$0.01	$0.03	$0.01	$0.00	$0.01	0.1	0.0	0.1
Finance and Insurance Services	$0.04	$0.02	$0.03	$0.05	$0.01	$0.01	$0.02	0.1	0.1	0.1
Ownership of Dwellings	$0.66	$0.50	$0.10	$0.60	$0.00	$0.00	$0.00	0.0	0.0	0.0
Property and Business Services	$0.02	$0.01	$0.03	$0.04	$0.01	$0.02	$0.03	0.1	0.3	0.4
Public Administration & Safety	$0.00	$0.00	$0.00	$0.01	$0.00	$0.00	$0.00	0.0	0.1	0.1
Education & Training	$0.13	$0.10	$0.02	$0.12	$0.09	$0.02	$0.11	1.2	0.3	1.5
Health care and social assistance	$0.10	$0.07	$0.01	$0.08	$0.06	$0.01	$0.08	0.9	0.2	1.1
Arts and recreation services	$0.03	$0.01	$0.00	$0.01	$0.01	$0.00	$0.01	0.1	0.0	0.1
Other Services	$0.06	$0.03	$0.02	$0.04	$0.02	$0.01	$0.04	0.5	0.3	0.8
Total	**$2.79**	**$1.38**	**$0.40**	**$1.78**	**$0.63**	**$0.20**	**$0.82**	**8.9**	**2.9**	**11.8**

Source: Modelled Result

Table 4.13 - Estimates of Economic Activity for the Regional Council of Goyder

	Total GSP Impact (3 yrs)	Average Annual GSP Impact	Total Jobs Impact (Person Years - over 3 yrs)	Average Annual Jobs Impact
Construction Phase				
Direct	$13.4 million	$4.5 million	95	32
Indirect	$4.9 million	$1.6 million	36	12
Total	*$18.3 million*	*$6.1 million*	*130*	*43*
Operating Phase				
Direct		$1.4 million		9
Indirect		$0.4 million		3
Total		*$1.8 million*		*12*

Source: Modelled Result

Note – these numbers are rounded versions of the numbers in the tables above, as the modelling should be interpreted in terms of order of magnitude, but it means that not all numbers are exactly additive.

From a local perspective in the Light Regional Council, the modelling indicates that the project will generate $20 million of value added (incomes created or contribution to Gross Regional Product), over the period of construction and, again allowing for lagged flow through effects, this would happen over three years. 146 person years of employment would be supported, or an average of 49 jobs sustained per year over three years. Once operational the project is estimated to support annually $2.3 million of incomes in the region, and

support directly and indirectly (including the multiplier impact) approximately 16 jobs per year.

Table 4.14 Estimates of Economic Activity by Sector Related to Aggregate Capital Spend for the Light Regional Council – Outcomes Over Life of Project

(Note that employment should be interpreted as person years of employment rather than number of jobs at a point of time)

	Expend-iture ($m)	Value Added ($m)			Income ($m)			Employment (FTE's)		
		Direct	Induced	Total	Direct	Induced	Total	Direct	Induced	Total
Agriculture, Forestry and Fishing	$0.27	$0.12	$0.35	$0.48	$0.04	$0.10	$0.14	0.8	2.4	3.2
Mining	$0.00	$0.00	$0.01	$0.01	$0.00	$0.01	$0.01	0.0	0.2	0.2
Manufacturing	$4.48	$1.20	$0.53	$1.73	$0.68	$0.30	$0.98	8.2	3.6	11.8
Electricity, Gas, Water and Waste Services	$0.38	$0.17	$0.11	$0.27	$0.06	$0.04	$0.10	0.8	0.5	1.3
Construction	$7.00	$1.78	$0.33	$2.11	$1.55	$0.29	$1.84	17.3	3.2	20.5
Wholesale Trade	$0.37	$0.17	$0.38	$0.56	$0.11	$0.25	$0.36	0.9	2.0	2.9
Retail Trade	$2.26	$1.29	$0.28	$1.57	$0.92	$0.20	$1.12	19.1	4.2	23.3
Accommodation and Food Services	$1.29	$0.53	$0.20	$0.72	$0.36	$0.13	$0.49	7.7	2.9	10.6
Transport, Postal & Warehousing	$7.27	$3.07	$0.43	$3.50	$2.05	$0.28	$2.34	26.3	3.7	30.0
Information Media & Telecommunications	$0.24	$0.12	$0.13	$0.25	$0.04	$0.04	$0.08	0.6	0.6	1.2
Finance and Insurance Services	$0.30	$0.21	$0.29	$0.49	$0.09	$0.12	$0.21	0.5	0.7	1.2
Ownership of Dwellings	$5.40	$4.11	$1.22	$5.33	$0.00	$0.00	$0.00	0.0	0.0	0.0
Property and Business Services	$0.12	$0.05	$0.55	$0.60	$0.04	$0.45	$0.49	0.5	5.3	5.7
Public Administration & Safety	$0.03	$0.01	$0.05	$0.06	$0.01	$0.04	$0.05	0.2	0.5	0.7
Education & Training	$1.09	$0.79	$0.27	$1.06	$0.73	$0.25	$0.97	10.2	3.5	13.7
Health care and social assistance	$0.93	$0.61	$0.16	$0.78	$0.58	$0.15	$0.73	8.3	2.2	10.5
Arts and recreation services	$0.12	$0.05	$0.03	$0.08	$0.04	$0.03	$0.07	0.5	0.3	0.8
Other Services	$0.47	$0.21	$0.23	$0.44	$0.19	$0.21	$0.41	3.8	4.3	8.1
Total	**$32.02**	**$14.50**	**$5.56**	**$20.06**	**$7.48**	**$2.89**	**$10.37**	**105.7**	**40.1**	**145.8**

Source: Modelled Result

Table 4.15 - Estimates of Annual Economic Activity by Sector Related to Operating Spend for the Light Regional Council

	Expend-iture ($m)	Value Added ($m)			Income ($m)			Employment (FTE's)		
		Direct	Induced	Total	Direct	Induced	Total	Direct	Induced	Total
Agriculture, Forestry and Fishing	$0.04	$0.02	$0.03	$0.05	$0.01	$0.01	$0.02	0.1	0.2	0.4
Mining	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0.0	0.0	0.0
Manufacturing	$0.35	$0.09	$0.05	$0.14	$0.05	$0.03	$0.08	0.6	0.3	1.0
Electricity, Gas, Water and Waste Services	$0.06	$0.03	$0.01	$0.04	$0.01	$0.00	$0.01	0.1	0.1	0.2
Construction	$0.38	$0.10	$0.03	$0.12	$0.08	$0.02	$0.11	0.9	0.2	1.2
Wholesale Trade	$0.06	$0.03	$0.04	$0.06	$0.02	$0.02	$0.04	0.2	0.2	0.3
Retail Trade	$0.37	$0.21	$0.03	$0.24	$0.15	$0.02	$0.17	3.1	0.4	3.5
Accommodation and Food Services	$0.21	$0.09	$0.02	$0.11	$0.06	$0.01	$0.07	1.3	0.3	1.5
Transport, Postal & Warehousing	$0.43	$0.18	$0.04	$0.22	$0.12	$0.02	$0.14	1.5	0.3	1.9
Information Media & Telecommunications	$0.04	$0.02	$0.01	$0.03	$0.01	$0.00	$0.01	0.1	0.1	0.2
Finance and Insurance Services	$0.05	$0.03	$0.03	$0.07	$0.01	$0.01	$0.03	0.1	0.1	0.2
Ownership of Dwellings	$0.89	$0.67	$0.12	$0.80	$0.00	$0.00	$0.00	0.0	0.0	0.0
Property and Business Services	$0.02	$0.01	$0.05	$0.06	$0.01	$0.04	$0.05	0.1	0.5	0.6
Public Administration & Safety	$0.00	$0.00	$0.00	$0.01	$0.00	$0.00	$0.01	0.0	0.0	0.1
Education & Training	$0.18	$0.13	$0.03	$0.16	$0.12	$0.03	$0.14	1.7	0.4	2.0
Health care and social assistance	$0.15	$0.10	$0.02	$0.12	$0.09	$0.02	$0.11	1.4	0.2	1.6
Arts and recreation services	$0.02	$0.01	$0.00	$0.01	$0.01	$0.00	$0.01	0.1	0.0	0.1
Other Services	$0.08	$0.03	$0.02	$0.05	$0.03	$0.02	$0.05	0.6	0.4	1.0
Total	**$3.34**	**$1.76**	**$0.53**	**$2.29**	**$0.78**	**$0.27**	**$1.05**	**12.0**	**3.7**	**15.7**

Source: Modelled Result

Table 4.16 - Estimates of Economic Activity for the Light Regional Council

	Total GSP Impact (3 yrs)	Average Annual GSP Impact	Total Jobs Impact (Person Years - over 3 yrs)	Average Annual Jobs Impact
Construction Phase				
Direct	$14.5 million	$4.8 million	106	35
Indirect	$5.6 million	$1.9 million	40	13
Total	*$20.1 million*	*$6.7 million*	*146*	*49*
Operating Phase				
Direct		$1.8 million		12
Indirect		$0.5 million		4
Total		*$2.3 million*		*16*

Source: Modelled Result

Note – these numbers are rounded versions of the numbers in the tables above, as the modelling should be interpreted in terms of order of magnitude, but it means that not all numbers are exactly additive.

In terms of racing the expenditures, using Light as the example - of the $350 million the assumptions above suggest that 15% will be spent in the region. But 10% of that is spent on regionally sourced labour, and as such much of what household income is spent on is imported into the region (and they also pay tax which is modelled as a leakage). From the IO table developed for this study for Light Regional Council only 42% is spend in the region the other 58% is imported (or taxes paid). The smaller the region, the higher this leakage. So therefore the actual expenditure in the region is only 9.2% of the total spend of $350 million (or $32.0 million as in Table 14.4).

This also explains the differences between Goyder and Light. Goyder is a smaller less contained region than Light and as such household consumption has more imports. Further because of that, it has slightly smaller multipliers. Therefore despite the assumptions being the same – the results are slightly higher for Light than for Goyder.

4.4 Additional Economic Impacts

This report focusses primarily on the potential employment and income benefits of the proposed Twin Creek Wind Farm Project. Job creation is an important community benefit and, at the regional level, the level of job creation is dependent upon two key factors:

1. The amount of investment and operational activity that can be captured by the region; and

2. The preparedness of the region and its people to apply for and accept available job vacancies. Having suitably trained people and geared up companies will maximize regional employment and incomes.

Examples of jobs created in the construction phase include:

- Project developers
- Field engineers
- Environmental managers and consultants
- Legal support
- Administrative and office support
- Numerous construction-related positions
- Transportation managers
- Contract and sub-contract managers
- On-site quarry operation
- Project controls engineers
- Safety technicians

Examples of jobs created in the operational phase include:

- Project managers
- Project coordinators
- Production managers
- Wind turbine technicians
- Wind turbine maintenance
- Environmental consultants
- Administrative and office support

Wind farms generally can have positive and negative socio-economic impacts depending on a variety of factors and the specific communities being impacted by the developments. For example, farmers hosting turbines may receive positive financial benefits while other communities might be subject to visual impacts with financial implications. Other than employment and income generation, two of the possible externalities of wind farms that are often discussed are on property values and carbon emissions. These are considered below.

4.4.1 Property Values

Many studies by independent organisations around the world have failed to find any correlation between wind turbines and declining property values. Some studies found positive property value impacts associated with:

- Improved regional amenities and infrastructure including local roads, firefighting access roads, etc.
- Increased regional incomes, jobs and property demand (as assessed above).
- Additional rental income from hosting wind turbine generators.
- Provision of a drought-proofing income streams.
- Provision of post-retirement income for farmers.
- Improved biodiversity via less intensive farm activity.
- Prevention of land subdivision and slowing down the process of productive agricultural land changing to rural residential uses in the short to medium term with the shift caused by the additional income generated from the wind farm providing additional cash flows to supplement the underlying agricultural use..
- Erosion control and passive wind protection for stock from sub stations and turbine wind turbine generators structures.

A report on community acceptance of rural wind farms by the CSIRO's Science into Society found that rural landowners with wind farm infrastructure on their properties stood to gain from such benefits.[16]

For properties without wind farm infrastructures but in the line of sight of turbines, statistical evidence supports that property values do not perform worse than properties in comparable regions without wind turbines. In many cases, property values have actually gone up faster than values in the comparable regions.

[16] CSIRO report http://www.csiro.au/Organisation-Structure/Flagships/Energy-Transformed-Flagship/Exploring-community-acceptance-of-rural-wind-farms-in-Australia.aspx, reported in Wind Energy the Facts, Clean Energy Council, March 2013.

A study conducted by the South Australia Department of Lands looked at properties located near eight wind farms and found no evidence that wind turbines caused property values to drop. The report found that wind farms "do not appear to have negatively affected property values in most cases". The report also found that "no reductions in sale price were evident for rural properties or residential properties located in nearby townships with views of the wind farm".[17]

Internationally, a decade long study across nine different states in the US by the Lawrence Berkeley National Research Laboratory found no negative relationship between wind turbines and property values. The study found "neither the view of the wind facilities nor the distance of the home to those facilities is found to have any consistent, measurable, and statistically significant effect on home sales prices".[18]

Also, the University of New Hampshire's Impact of the Lempster Wind Power Project on Local Residential Property Values from January 2012 found no evidence that the project had an impact on property values in the region. The study also said "this is consistent with the near unanimous findings of other studies — based their analysis on arms-length property sales transactions — that have found no conclusive evidence of wide spread, statistically significant changes in property values resulting from wind power projects".[19]

While the above studies and evidence support that wind farms have no long term detrimental impact on overall property values, it must be recognised that over time many other factors impact property values such as general market conditions, population trends and the local property supply/demand balance.

There will be localised positive and negative impacts associated with wind farms depending on individual property locations and characteristics. Some may appreciate faster than market trends due to improved farm incomes from hosting wind turbine generators (more than offsetting the marginal loss of productive land) and improved access to infrastructure. Some may fail to keep pace with market trends due to perceptions of visual and noise impacts. Potential disruption during wind turbine generator assembly and infrastructure establishment

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[17] South Australia Department of Lands report http://www.lpi.South Australia.gov.au/__data/assets/pdf_file/0018/117621/t0L51WT8.pdf reported in Wind Energy the Facts, Clean Energy Council, March 2013.

[18] Lawrence Berkeley study, United States http://eetd.lbl.gov/ea/ems/reports/lbnl-2829e.pdf, reported in Wind Energy the Facts, Clean Energy Council, March 2013. This study was further confirmed in the August 2013 study by the Berkley National Laboratory "A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States" which used data for 50,000 home sales across the USA for homes from within 1 mile ot within 10 miles of a wind farm to conclude that "we find no statistical evidence that home values near turbines were affected in the post-construction or post-announcement/pre-construction periods"

[19] *Impact of the Lempster Wind Power Project on Local Residential Property Values*, January 2012 http://antrim-wind.com/files/2012/05/14B_lempster_property_value_impacts_final-copy-copy.pdf reported in Wind Energy the Facts, Clean Energy Council, March 2013

is also noted. However, the evidence supports no overall long term negative impact on property values associated with wind farm developments.

4.4.2 Carbon Emissions

Renewable wind energy generation has significant environmental benefits through carbon emissions reduction where it replaces coal or gas generated electricity. The debate in this area comes down conclusively on the carbon reduction benefits of wind farms relative to fossil fuels[20]

To estimate the value of this reduction it is assumed that the Twin Creek Wind Farm will have the following operating characteristics:

- Total wind farm capacity of up to 183 megawatts.
- Annual average utilisation rate of 40%[21].
- Total generation of 613 Gigawatt hours (Gwh) per annum.

It is conservatively assumed that when electricity is generated through coal fired stations, it produces 0.8 tonnes of carbon per megawatt hour[22] of electricity generated. So the generation of 613 Gwh per annum through coal generation would produce in the order of 0.491 million tonnes of carbon emissions. At a carbon price of $20 per tonne (historically conservative relative to international trading schemes, and much lower than what is expected in the longer term – but matching current prices[23]), the value of carbon emission savings therefore associated with the Twin Creek Wind Farm is estimated to be $9.8 million per annum or a net present value of $104million over a 20 year period (real discount rate of 7%).

[20] The arguments re carbon emissions in wind versus fossil fuels generated electricity is summarized by Professor Barry Brooks (University of Adelaide) at http://bravenewclimate.com/2010/09/01/wind-power-emissions-counter/
[21] Defined as the actual output of the project relative to its maximum possible output

[22] Annual carbon emissions from the National Electricity Market fell by over 12 million tonnes (CO2-e) between June 2012 and May 2013. They fell by only around 1.5 million tonnes over the previous twelve-month period. Carbon pollution per megawatt-hour has also fallen: from 0.86 to 0.81 tonnes per unit of output, or a little over 5 per cent. Source: The Climate Institute – www.climateinstitute.org.au
[23] http://www.worldbank.org/en/programs/pricing-carbon cites "Royal DSM has put a so-called internal price on carbon of EUR50 per ton of CO2e. Sijbesma said this will 'future proof' the business by changing the mindset when reviewing large investment decisions". http://calcarbondash.org/ indicates a current price of US$13 per tonne (having fallen somewhat in the last few years)

5 CONCLUSION

This socio-economic impact assessment focuses on the effect of the Twin Creek Wind Farm Project on regional incomes and employment associated with the construction and operating phases of the project. This effect arises through the primary expenditure directly associated with the project, and then from further 'rounds' of indirect expenditure that this direct expenditure stimulates as it flows to supplying industries and into incomes and consumption.

The economic modelling for the project has been undertaken using indicative assumptions with respect to labour supply. The commitment of the project developers is that there will be prioritisation of local contractors wherever possible, but the modelling assumes that the wind turbine generators are imported from interstate or overseas, and the major local impact is based on transport and assembly.

From a **State perspective**, economic modelling indicates that the project will generate $209 million of value added (which is a net contribution to Gross State Product[24]) in the State of South Australia over the period of construction and that this would happen over three years (allowing for lagged flow through effects). 1,447 person years[25] of employment in South Australia would be supported – or an average of over 480[26] jobs sustained per year over three years. Once operational the project is estimated to support annually $15.5 million of value added in South Australia, and support directly and indirectly in the order of 105 jobs per year. The impact at the national level would be similar to the state level, unless there are constraints in national labour and capital markets with such constraints likely to be limited in the current macroeconomic environment.

From a **regional perspective**[27], the modelling indicates that the project will generate $64 million of value added (contribution to Gross Regional Product) in the region (Barossa and Lower North) over the period of construction and, again allowing for lagged flow through effects, this would happen over three years. 477 person years of employment would be supported, or an average of 159 jobs sustained per year over three years. Once operational the project is estimated to support annually $6.2 million of value added in the region, and support directly and indirectly (including the multiplier impact) approximately 44 jobs per year.

[24] Value added is the way in which economic activity is measured in the National Accounting system. At the national level this is equivalent to Gross Domestic Product (GDP) and is made up of returns to labour (wages and salary and taxes on labour) and returns to capital (gross operating surplus (or profits plus depreciation and financing costs) and company tax and GST). At the state level, the national accounts call this amount the Gross State Product.
[25] i.e. the number of full time equivalent annual jobs created over the period.
[26] 1,474÷3
[27] Regional in this context is defined as the ABS regions of the Barossa and Lower North.

From a **local perspective**[28], based on the assumptions used (which involve project drawing labour from both the Goyder and Light areas the modelling indicates that the project will generate:

- $18 million of value added (contribution to Gross Regional Product) in the LGA of Goyder over the period of construction and, again allowing for lagged flow through effects, this would happen over three years. 130 person years of employment for local residents would be supported, or an average of 43 jobs sustained per year over three years. Once operational the project is estimated to support annually $1.8 million of value added in the region, and support directly and indirectly (including the multiplier impact) approximately 12 jobs per year.

- $20 million of value added (contribution to Gross Regional Product) in the LGA of Light over the period of construction over three years. 146 person years of employment for local residents would be supported, or an average of 49 jobs sustained per year over three years. Once operational the project is estimated to support annually $2.3 million of value added in the region, and support directly and indirectly (including the multiplier impact) approximately 16 jobs per year.

These outcomes are based on assumed levels of local supply, and where more of the activity can be retained in the region (while acknowledging the specialist nature of the construction itself), the more extensive the degree of regional economic activity.

Wind farms can have other positive and negative socio-economic impacts depending on a variety of factors and the specific communities being impacted by the developments. For example, farmers hosting turbines may receive positive financial benefits while other communities might be subject to visual impacts from windfarm infrastructure with no financial benefits. In addition to employment and income generation, property values and carbon emissions are socio-economic externalities of wind farms as measured in this report.

[28] Local in this context is the LGA's of Goyder and Light.