

Wallaby Creek Wind Farm Economic Assessment

Prepared for

Environmental Resource Management Australia Pty Ltd

By



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DEFINITIONS

Consumption-induced flow-on	the spending by households of the extra income they derive from the production of the extra \$1 of output and production induced effects. This spending in turn generates further production by industries.
Economic activity	measures of economic activity include output, value-added, income and employment.
Economic impact	refers to the effect of a project on economic activity within a local area, region, state or nation.
Employment	the number of people employed (including full-time and part-time).
Gross regional product	one of several measures of the size of an economy. It is the market value of all final goods and services produced by all firms in an economy.
Direct impact	economic activity of the project itself e.g. revenue, employment, value-added and wages/income.
Household income	the wages paid to employees including imputed wages for self-employed and business owners.
Indirect impact	economic activity that arises from the project purchasing inputs to production and the supplier of those inputs to production in turn purchasing inputs to its production etc, and employment from the project spending their wages to purchase goods and services, and the provider of those goods and services in turn purchasing goods and services etc.
Input-output analysis	a method to assess the direct and indirect economic activity generated by a proposal through spending.
Multiplier	a summary measures used for predicting the total impact on all industries in an economy from changes in the demand for the output of any one industry. There are many types of multipliers.
Output	total revenue or business turnover.
Producer surplus	a benefit of a project that accrues to producers (businesses). It is equal to the price a producer receives for providing a good or service less the costs of production.
Production-induced flow-on	the sum of the first-round effects and industrial support effects (i.e. the total amount of output from all industries in the economy required to produce the initial change in output).
Type 11a ratio multiplier	summarises the total impact on all industries in an economy in relation to the initial own sector effect e.g. total income effect from an initial income effect and total employment effect from an initial employment effect, etc.
Value-added	the difference between the gross value of business turnover and the costs of the inputs of raw materials, components and services bought in to produce the gross regional output.

ABBREVIATIONS

Abbreviation	Meaning
ABS	Australian Bureau of Statistics
ANZSIC	Australian and New Zealand Standard Industrial Classification
BESS	Battery Energy Storage System
DIDO	Drive-In Drive-Out
DPHI	NSW Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act
FTE	Full-Time Equivalent
FIFO	Fly-In Fly-Out
GRIT	Generation of Regional Input Output Tables
IO	Input-Output (analysis/model/table)
LGA	Local Government Area
MWh	Megawatt Hour
MW	Megawatt
NEM	National Electricity Market
NSW	New South Wales
REZ	Renewable Energy Zone
SEARs	Secretary's Environmental Assessment Requirements
SSD	State Significant Development

EXECUTIVE SUMMARY

Introduction

Acciona Energy Australia Global Australia Pty Ltd (the Proponent) proposes to construct, operate and decommission the Wallaby Creek Wind Farm (Project), located 10 kilometres (km) south of Narromine and 15 km north of Tomingley in the Narromine Shire Council Local Government Area (LGA) of New South Wales (NSW). The Project would consist of up to 38 wind turbines with an estimated capacity of up to 236 Megawatts (MW) and supporting infrastructure, including a Battery Energy Storage System (BESS) facility with a capacity of up to 200 MW, and storage of up to 400 MW hours (MWh), and an accommodation camp for construction workers.

The Project is considered to be State Significant Development (SSD) pursuant to schedule 1 of State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP). This Economic Assessment analyses the potential economic impacts of the construction, operation and decommissioning of the Project on the regional and NSW economy. It forms part of the Environmental Impact Statement (EIS) for the Project.

The impacts have been assessed in accordance with the Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW Department of Planning, Housing and Infrastructure (DPHI) and against the relevant legislation and guidelines as they apply to economics.

Methodology

The benefit of the Project, as an integral component of the NSW Electricity Strategy which aims to deliver reliable, affordable and sustainable electricity systems for NSW, was assessed qualitatively.

The Project's potential economic activity impacts on the regional and NSW economies were assessed using Input-Output (IO) analysis.

Qualitative consideration based on economic principles of demand and supply was also given to potential cumulative impacts of the project and other relevant projects, and demand for regional and NSW labour resources and other inputs to production.

Existing environment

The study area / regional economy for this economic impact assessment was defined as the Narromine LGA. This is the region within which the Project is located and will be relevant for providing employment, goods and services and worker accommodation. It is also the region that may experience impacts from reduction in agricultural activity and from increased demand for labour and other inputs to production. While the region is the focus of the analysis, impacts on the NSW economy are also assessed.

The region, with a 2021 population of 6,360 and a labour force of 2,773, is characterised by an older median age and a significantly higher proportion of Aboriginal and / or Torres Strait Islanders compared to NSW. Education attainment and household incomes are lower than the state average, while unemployment is slightly below the NSW rate. Major occupations of usual residents are *Managers* (including *Farm Managers*), *Professionals*, *Technicians / Trade Workers*, and *Laborers*, with many residents employed in the *Agriculture*, *Education*, *Health*, and *Transport* sectors. Around one-third of workers who live in the LGA commute outside the region for work, mainly to Dubbo Regional LGA.

The population has been declining at -0.2% annually since 2006, contrasting with NSW's growth, though slight regional growth is projected over the next two decades. Exporting sectors are key drivers of regional economies and reflect a region's endowments and competitive advantages. Key industries driving exports are *Mining*, *Agriculture*, *Manufacturing*, *Utilities*, and *Transport*. In terms of value-added, the Australian and New Zealand Standard Industrial Classification (ANZSIC) one-digit industry sectors of *Agriculture/Forestry/Fishing*, *Mining*, *Rental, Hiring and Real Estate Services*, *Education and Training*, and *Health Care and Social Assistance*, had the highest value-added in total, equal to approximately 72 per cent (%) of the regional economy and 60% of regional employment.

Potential construction impacts

The average annual construction impacts of the Project (for 24 months) on the regional economy are estimated at up to:

- \$97 Million (M) in annual direct and indirect output.
- \$38 M in annual direct and indirect value added.
- \$18 M in annual direct and indirect household income.
- 168 direct and indirect jobs.

The average annual construction impacts of the Project on the NSW economy are estimated at up to:

- \$159 M in annual direct and indirect output.
- \$89 M in annual direct and indirect value added.
- \$29 M in annual direct and indirect household income.
- 289 direct and indirect jobs.

The impacts of construction of the workforce accommodation camp are included in the above. However, the operation of the accommodation camp will also provide some economic activity to the region. This has not been modelled but would be minor in comparison to the construction impacts.

The construction phase of the Project will result in a temporary reduction in up to 562.1 hectares (ha) of land available for agricultural activity – sheep grazing and cropping. The economic activity impacts associated with this were assessed and identified as negligible relative to the economic activity impacts of the Project construction.

The construction of the Project will create demand for regional labour resources and regional inputs to production which has the potential to result in some regional wage and price increases. However, these impacts will be moderated by the Project using an accommodation camp to house in the order of 70% of the construction workforce who will be sourced from outside the region.

Potential operational benefits and impacts

By adding up to 236 MW of clean wind generation alongside a 200 MW / 400 MWh battery, the Wallaby Creek Wind Farm will boost electricity supply to the National Electricity Market (NEM). This will help the transition away from fossil fuel sources, reduces overall carbon intensity, and suppress wholesale prices, ultimately benefiting consumers. The co-located battery will provide grid-support services such as frequency control and firming capacity, which will enhance the stability and reliability across the NEM.

The Project operation will also provide economic activity to the regional and NSW economies. The Project operation is estimated to make up to the following total annual contribution to the regional economy:

- \$82 M in annual direct and indirect regional output.
- \$73 M in annual direct and indirect regional value-added.
- \$1 M in annual direct and indirect household income.
- 10 direct and indirect jobs.

The Project operation is estimated to make up to the following total annual contribution to the NSW economy:

- \$88 M in annual direct and indirect regional output.
- \$78 M in annual direct and indirect regional value-added.
- \$2 M in annual direct and indirect household income.
- 22 direct and indirect jobs.

The construction and operation impacts are larger for the NSW economy because there is less leakage of direct and indirect expenditure out of the NSW economy compared to the regional economy i.e. the NSW economy because of its size and diversity is better placed to provide more of the inputs to production than the regional economy.

Businesses that can provide the inputs to the production process required by the Project and / or the products and services required by the workforce would directly benefit from the Project by way of an increased economic activity. However, because of the inter-linkages between sectors, many indirect businesses also benefit.

The operation phase of the Project will result in a reduction in up 530.6 ha of land available for agricultural activity – sheep grazing and cropping. The economic activity impacts associated with this are negligible.

The operation of the Project will create a small demand for regional labour resources and regional inputs to production. Consequently, no wage or price increases or production shortages are anticipated.

Cumulative impact assessment

The main cumulative economic impact of this and other prospective projects in the region is to generate large demand for a suitably qualified construction workforce in the region and surrounds. This demand can help address the jobs growth imbalance between Australia's biggest cities and regions. The Project will provide opportunities for the existing and future regional workforces, attracting middle skilled and high skilled workers and families to regional areas, reducing outmigration of the regional workforce to look for employment in cities, and increase regional labour force participation.

Notwithstanding, cumulative demand for construction workers can in the short run potentially lead to increased construction wages, attraction of workers from other relevant sub-sectors and sectors of the economy leading to labour shortages in these other areas of the economy (and associated shortages of goods and services), and rising prices as firms pass wage costs onto consumers. The extent of these impacts for regional economies will depend on the balance of labour supply from inside the region, outside the region and Drive-In Drive-Out (DIDO)/Fly-In Fly-Out (FIFO), as well as adjustment of the overall labour market to respond to increased demand.

In addition, in the short run excess demand for inputs to construction such as quarry materials and concrete can result in rising costs for these factor inputs and potentially shortages for other uses.

These potential impacts will be more likely and larger because of cumulative projects across the region and the State, than from the individual Project.

Management measures

The positive local employment and business opportunities can be maximised via:

- Employment of regional residents where they have the required skills and experience.
- Participating, as appropriate, in business groups, events or programs in the regional community.
- Locally sourcing non-labour inputs to production where local producers can be cost and quality competitive.
- Preparation and implementation of a benefits sharing scheme administered and distributed by Narromine Council via a planning agreement with the intention of supporting local non-profit organisations, community programs/events, local businesses, training, and services / infrastructure.
- Lease payments to host landowners that provide an alternative drought proof income with potential flow-on benefits to the regional economy.
- Continued agricultural activities during the operational phase of the Project and reinstatement of full pre-project agricultural production following project decommissioning.

1 INTRODUCTION

1.1 Introduction

Gillespie Economics was engaged by ERM Australia Pty Ltd to conduct an Economic Assessment of the Wallaby Creek Wind Farm (the Project) for Acciona Energy Australia Global Australia Pty Ltd (the Proponent). Economic impacts from the construction, operation and decommissioning phases of the Project are addressed in this report in accordance with relevant regulatory requirements and guidelines. This report supports a State Significant Development (SSD) application under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (SSD- 67105475), as part of the Environmental Impact Statement (EIS) for the Project. It also supports the controlled action decision under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Project is located 10 kilometres (km) south of Narromine and 15 km north of Tomingley in the Narromine Shire Council Local Government Area (LGA) of New South Wales (NSW). The Project will consist of up to 38 wind turbines with an estimated capacity of up to 236 Megawatts (MW) and supporting infrastructure, including a Battery Energy Storage System (BESS) facility with a capacity of up to 200 MW, and storage of up to 400 MW hours (MWh), and an accommodation camp for construction workers.

1.2 Assessment guidelines and requirements

This assessment has been prepared in accordance with requirements of the NSW Department of Planning, Housing and Infrastructure (DPHI) which were set out in the Planning Secretary's Environmental Assessment Requirements (SEARs) for the project, issued on 11 February 2025. The SEARs identify matters which must be addressed in the EIS. **Table 1.1** lists individual requirements relevant to this Economic Assessment and where they have been addressed.

Table 1.1 – Economic Assessment Related SEARs

Requirement	Section addressed
The EIS must address the following:	
Any benefits of the economic impacts or benefits of the project for the region and the State as a whole	Chapters 4, 5, 6 and 7 of this report.
Consideration of any increase in demand for community infrastructure services	See the Social Impact Assessment
Details of how the construction workforce will be managed to minimise local impacts, including a consideration of the construction workforce accommodation	See the Social Impact Assessment
Details of proposed benefit-sharing arrangements, in accordance with the Benefit-Sharing Guideline.	Chapter 4 and the Social Impact Assessment

To inform preparation of the SEARs, DPHI invited relevant government agencies to advise on matters to be addressed in the EIS. These matters were considered by the Secretary for DPHI when preparing the SEARs.

There are no economic assessment guidelines for SSD wind farm projects.

1.3 Structure of the report

This report is structured as follows:

- Section 2 outlines the methodology used for the Economic Assessment.
- Section 3 provides an overview of the regional economy within which the Project is located.
- Section 4 assesses the economic impacts of construction of the Project on the regional and NSW economy.
- Section 5 assesses the economic benefits of the Project and the impacts of operation of the Project on the regional and NSW economy.
- Section 6 assesses the economic impacts of decommissioning of the Project on the regional and NSW economy.
- Section 7 considers potential cumulative impacts on the region and State.
- Section 8 identifies measures to mitigate and manage economic impacts.
- Section 9 provides the conclusions of the assessment.

2 Methodology

2.1 Overview

The Project would form an integral component of the NSW Electricity Strategy which aims to deliver reliable, affordable and sustainable electricity systems for NSW. The benefits of the Project to the NSW electricity system have been assessed qualitatively.

The Project would also generate economic activity within the regional and NSW economy, during construction, operation and decommissioning. It would also result in a minor contraction in agricultural economic activity from the construction and operation footprint. The assessment of these potential economic impacts has been undertaken using Input-Output (IO) analysis. Other potential impacts are discussed qualitatively.

2.2 Study area

The Project is in the Narromine LGA which contains the towns of Narromine (population 3,507), Trangie (population 768), Tomingley (population 342) and Tullamore (population 218). The closest regional centre to the Project is Dubbo (population 38,783) which is located 40 km to the northeast in the Dubbo Regional LGA (population 54,922). The towns nearest to the Project will be relevant for providing labour, goods and services and some worker housing. They are also the towns that may experience impacts from reduction in agricultural activity and from increased demand for labour and other inputs to production. The study area/regional economy for this economic assessment is defined as the LGA of Narromine, recognising that there will also be impacts on the Dubbo LGA. While the Narromine LGA is the focus of the analysis, impacts on the NSW economy are also assessed.

2.3 Data used to describe the regional economy

Prior to the assessment of impacts using IO analysis, a description of the regional economy is provided. This is based on Australian Bureau of Statistics (ABS) Census of Population and Housing data and information from the model of the regional economy developed for the IO analysis. Data is provided at different levels of aggregation i.e. one-digit and four-digit Australian and New Zealand Standard Industrial Classification (ANZSIC),¹ and IO sector classifications,² to provide a more complete picture of the regional economy.

2.4 Input-output analysis

IO analysis is used to assess the direct and indirect impacts (gross economic footprint) of the construction and operation of the Project on the regional and NSW economy.

IO analysis involves two key steps:

- Development of an appropriate IO table (regional transaction table) that can be used to identify the economic structure of the region and multipliers for each existing sector of the economy. IO tables for the regional and NSW economy were developed using the Generation of Regional IO Tables (GRIT) procedure developed by the University of Queensland and recognised internationally - Refer to **Attachment 1**.
- Identification of the direct impact or stimulus of the Project, in a form that is compatible with the IO equations, so that the IO multipliers and flow-on effects for the impacts or stimulus of the project can then be estimated (West, 1993). The direct impact of the project was estimated from data provided by the proponent, published data on the operating costs of renewable energy projects and

¹ The ANZSIC classifies industries at four levels – Divisions (the broadest level), Subdivisions, Groups and Classes (the finest level). The broadest level of Divisions (one-digit level) comprises 17 industries and provides a broad overall picture of the economy. The finest level of Classes (four-digit level) comprises 720 industry categories.

² Input Output Product Classifications are based on the characteristic products of industry sectors. There are currently 115 intermediate sector classifications.

wages, and production ratios in the IO tables (see more detailed explanation below). Indirect effects were estimated using the *EconImp2* program.³

IO analysis identifies the economic activity of a project on the economy in terms of four main indicators:

- Gross regional output – the gross value of business turnover in a region.
- Value-added – the difference between the gross value of business turnover and the costs of the inputs of raw materials, components and services bought in to produce the gross regional output. These costs exclude wage costs.
- Income – the wages paid to employees including imputed wages for self-employed and business owners.
- Employment – the number of people employed (including self-employed, full-time, and part-time).

IO analysis is focused on economic activity that occurs in a region. Direct effects e.g. output, value-added, income and employment, of construction of the Project in the region are counted even if these effects do not accrue to existing regional businesses and residents. Production induced flow-on effects and consumption induced flow-on are estimates of flow-on effects to the region that arise from the direct expenditures that occur in the region.

The standard IO method is based on several assumptions that are outlined in Attachment 2. Notably, IO analysis assumes that the regional economy has access to sufficient labour and capital resources (from both inside and outside the region) so that an individual project does not result in any regional price changes e.g. wages in other industries or house rentals, which would lead to contractions (“crowding out”) of economic activity in other sectors in the same region. Any “crowding out” is implicitly assumed to occur outside the region where the project is concentrated, and the regional impact analysis is focused. A dynamic computable general equilibrium modelling approach may overcome the limitation of IO analysis but is unlikely to be warranted at a local or regional scale or with small scale impacts.

Qualitative consideration is given to potential “crowding out” impacts from the Project and cumulative projects on the region and State.

Another major assumption of the standard IO method is that each industry exhibits constant returns to scale in production. This linearity assumption implies a strict proportional relationship between output changes and inputs, including labour. In this study, this assumption has been relaxed by using marginal (elasticity-adjusted) technical coefficients rather than average technical coefficients. Consequently, the IO modelling reflects sectoral supply responsiveness—yielding credible, “next-unit” estimate of gross economic impact.

2.5 Assessing construction direct impacts

Construction expenditure is associated with manufacturing of equipment and expenditure across the following three construction sectors of the IO industry classification:

- The *Heavy and Civil Engineering Construction Sector* which includes businesses involved in engineering construction and project management services for a diverse range of activities including on-site assembly of heavy electrical machinery from prefabricated components, transmission lines, road construction etc.
- The *Construction Services Sector* which includes businesses involved in earthmoving work such as levelling of construction sites, excavation of foundations, trench digging, concreting services, electrical services, hire of earthmoving plant with operator etc.
- The *Non-Residential Building Construction Sector* which includes businesses engaged in the construction of industrial buildings including worker accommodation camps.

³ The *EconImp2* program uses the Leontief Inverse Matrix and marginal coefficients to estimate indirect effects.

Conservatively, all machinery manufacturing is assumed to occur outside Australia. It is recognised that some machinery may be sourced from the region and in particular NSW, however no data is currently available to include this in the analysis.

Project construction over a 24-month period is estimated to be associated with an average annual Full time Equivalent (FTE) workforce of 123 workers, with 30% sourced from the region, and 54% from NSW. Based on the IO coefficients of the *Heavy and Civil Engineering Construction* sector, *Construction Services* sector, and *Non-Residential Building* sector in the IO transactions table for the local area, \$74 M of expenditure would be required across these sectors for this workforce. Construction impacts are therefore based on expenditure of \$74 M.

2.6 Assessing operation direct impacts

For the analysis of the operational phase of the Project, a new Project operation sector was developed, reflecting average annual operation.

This sector is based on costs and revenues / output at the Project boundary. Output was estimated from the installed capacity and an estimate of the wholesale bundled electricity and renewable energy certificate revenue per annum. The proponent advised of an operational employment of five (all of which are assumed to reside in the region). Wages for this level of employment were based on IBISworld (2025). Total nonwage expenditure was estimated from Aurecon (2024). Nonwage expenditure was allocated between imports and 115 intermediate sectors based on an assumed expenditure breakdown and application of regional location quotients, and converted to basic values, taxes and margins.

3 THE REGIONAL ECONOMY

3.1 Introduction

This section characterises the regional economy from two perspectives, residents of the region and workers in the region. Characterisation of the NSW economy is provided where appropriate for comparison with the regional economy.

3.2 Residents of the region

Table 3.1 provides some characteristics of the usual residents of the regional economy based on the 2021 ABS Census of Population and Housing. In 2021, the region had a population of 6,360 and a labour force of 2,773, 0.1% of the population and workforce of NSW. The median age of the regional population was 41, two years older than the median age of the NSW population. The region had a higher percentage of the population identifying as Aboriginal and / or Torres Strait Island (20.4%) than NSW (3.4%). The regional population had a lower level of educational attainment than NSW, with 11.0% holding a bachelor’s degree or higher, compared to 27.8% for NSW.

In the 2021 Census, 4.4% of the total regional labour force (121 people) were unemployed compared to 4.9% of the labour force of NSW. The median weekly household income in the region was \$1,308 compared to \$1,829 for NSW. Median weekly rents in the region were \$240 compared to \$420 for NSW.

The main occupations of usual residents in the region (**Figure 3.1**) were Managers (including Farm Managers) (21%), Technicians and Trade Workers (13%), Technicians and Trade Workers (13%) and Labourers (12%). This compares to NSW where the main occupation of usual residents were Professionals (26%), Managers (15%) and Clerical and Administrative Workers (13%).

Figure 3.1 – Employment by Occupation of Usual Residents

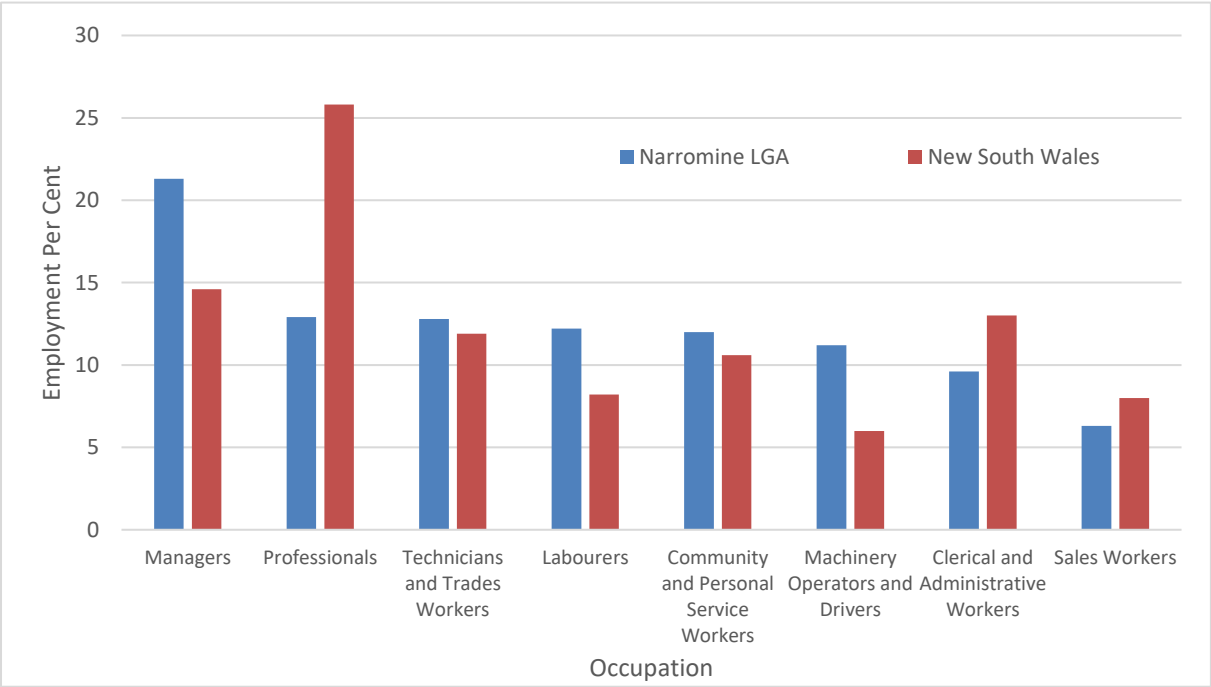


Table 3.1 - Characteristics of Usual Residents

	Narromine LGA		NSW	
Population	6,360		8,072,163	
% Aboriginal and/or Torres Strait Islanders	20.4		3.4	
Median Age	41		39	
% of population <15 years	21.2		18.2	
% of population 65+	21.8		17.7	
In labour force	2,773		3,874,012	
Unemployed	%	4.4	%	4.9
		No. 121		189852
Labour force to population ratio	43.6		48.0	
Median household weekly income	1,308		\$1,829	
Unoccupied private dwellings	%	12.5	%	9.4
		No. 317		299,524
Median weekly rent	\$240		\$420	
Level of highest education attainment - 15+	No.	%	%	No.
Year 9 or below	581	11.6	487,855	7.4
Year 10	826	16.5	698,390	10.6
Year 12	624	12.4	954,987	14.5
Bachelor's degree and above	551	11.0	1,838,502	27.8
Occupations	No.	%	No.	%
Managers	565	21.3	536,820	14.6
Professionals	341	12.9	952,131	25.8
Technicians and Trades Workers	338	12.8	436,589	11.9
Labourers	324	12.2	300,966	8.2
Community and Personal Service Workers	317	12.0	390,779	10.6
Machinery Operators and Drivers	296	11.2	222,186	6.0
Clerical and Administrative Workers	253	9.6	480,612	13.0
Sales Workers	168	6.3	294,889	8.0

Source: Australian Bureau of Statistics, 2021 Census of Population and Housing, Community Profiles

The main four-digit ANZSIC industry sectors in which usual residents were employed in 2021 is provided in **Table 3.2**. *Grain-Sheep or Grain-Beef Cattle Farming, Other Grain Growing, Primary Education, Hospitals (except Psychiatric Hospitals) and Road Freight Transport*, were the most significant employment sectors for usual residents of the region.

A total of 32% of employed usual residents work outside the region, mainly Dubbo Regional LGA (23%) and No fixed address (NSW) (4%).

Table 3.2 - Top 5 Industry Sectors of Employment for Usual Residents (Four Digit ANZSIC)

Narromine LGA	%	NSW	%
Grain-Sheep or Grain-Beef Cattle Farming	5.2	Hospitals (except Psychiatric Hospitals)	4.2
Other Grain Growing	4.8	Supermarket and Grocery Stores	2.5
Primary Education	3.6	Other Social Assistance Services	2.4
Hospitals (except Psychiatric Hospitals)	3.3	Computer System Design and Related Services	2.3
Road Freight Transport	2.7	Aged Care Residential Services	2.2

Source: Australian Bureau of Statistics, 2021 Census of Population and Housing, Community Profiles

An indication of the health of an economy can be gained from population changes. This theory of regional economic growth suggests that places that can attract population immigration⁴ create increased demand for goods and services and thus more jobs. This growth leads to increasing local multiplier effects, scale economies and an increase in the rate of innovation and capital availability

⁴ Mainly due to natural endowments and comparative advantage in certain industry sectors.

(Sorensen, 1990). Conversely, population losses can contribute to a cycle of decline whereby reduced populations results in closure of services, which in turn makes it difficult to attract new populations (Sorensen, 1990).

Trends in regional economies of NSW because of globalisation and associated structural adjustment include:

- Loss of significant industries such as abattoirs and timber mills from many rural areas.
- Increased mechanisation of agriculture and aggregation of properties, resulting in loss of employment opportunities in this industry.
- Growth of regional centres, at the expense of smaller towns.
- Preference of Australians for coastal living, particularly for retirement.
- Preference of many of today's fastest growing industries for locating in large cities (Collits, 2000).

The result is that there has been declining population in many rural LGAs that are in non-coastal areas in NSW. There has also been a decline in the population of smaller towns even in regions where the population has been growing.

Against this backdrop, it is evident that the population of the regional economy has been declining at an average annual rate of -0.2% per cent since 2006, compared to an average annual growth rate of 1.25% for NSW.

Table 3.3 - Population growth

	Population				Average Annual Growth Rate			
	2006	2011	2016	2021	2006 - 2011	2011 - 2016	2016 - 2021	2006 - 2021
Narromine LGA	6,691	6,832	6,617	6,448	0.4%	-0.6%	-0.5%	-0.2%
NSW	6,742,690	7,218,529	7,732,858	8,093,815	1.4%	1.4%	0.9%	1.3%

Source: Australian Bureau of Statistics, 2023 Estimated Resident Population, Local Government Areas, Australia

The population of the region (**Table 3.4**) is predicted to grow at an average annual rate of 0.14%, a fraction of that for NSW (NSW DPHI, 2024).

Table 3.4 – Projected population growth

Local Government Area	2021	2041	Change	Annual %
Narromine LGA	6,448	6,624	176	0.14%
NSW	8,097,062	10,070,467	1,973,405	1.22%

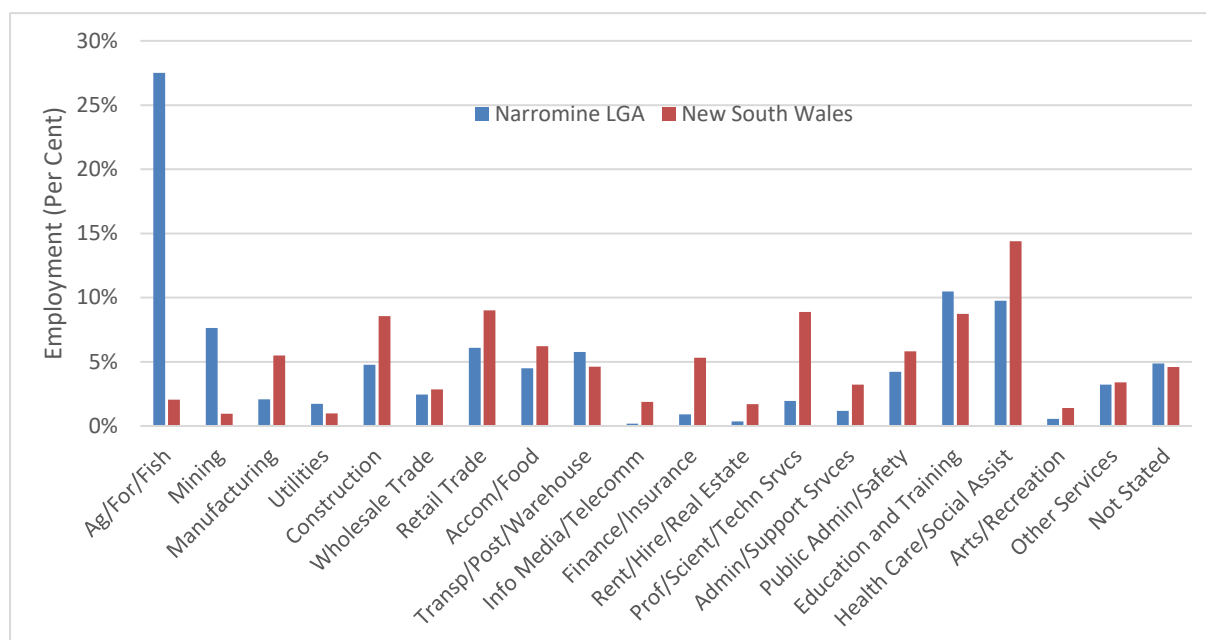
Source: NSW Department of Planning and Environment (2024)

3.3 Economic activity in the region

An indication of the nature of the regional economy can be gained by examining one-digit ANZSIC place of work employment by industry data - refer to **Figure 3.2**. This indicates the significance of the *Agriculture, Forestry and Fishing* sector.

Seventeen per cent of people who work in the region live outside the region, mainly in Dubbo Regional LGA (13%), Parkes LGA (1%), and Warren LGA (1%).

Figure 3.2 - Place of work employment by industry (One-digit ANZSIC)



Source: Australian Bureau of Statistics, 2021 Census of Population and Housing, Working Population Profiles

At the more disaggregated level (place of work employment by four-digit ANZSIC) the main industry sectors of employment in the region are *Gold Ore Mining, Grain-Sheep or Grain-Beef Cattle Farming, Other Grain Growing, Primary Education* and *Road Freight Transport*.

Table 3.5 - Place of Work Top 5 Industry Sectors of Employment (Four-digit ANZSIC Sectors)

Narromine LGA	%	NSW	%
Gold Ore Mining	7.2	Hospitals (except Psychiatric Hospitals)	4.1
Grain-Sheep or Grain-Beef Cattle Farming	6.7	Supermarket and Grocery Stores	2.5
Other Grain Growing	6.0	Other Social Assistance Services	2.4
Primary Education	4.5	Computer System Design and Related Services	2.3
Road Freight Transport	3.2	Aged Care Residential Services	2.2

Source: Australian Bureau of Statistics, 2021 Census of Population and Housing, Table Builder

Exporting sectors are based on a region's endowments and competitive advantages, and in regional economic development economics are the key drivers of the economy. The largest exporting industries (One-digit ANZSIC) are:

- *Mining (\$328 million)* mainly *Non Ferrous Metal Ore Mining (Gold Ore)*.
- *Agriculture, Forestry and Fishing (\$286 million)* mainly *Sheep, Grains, Beef and Dairy Cattle*.
- *Manufacturing (\$31 million)* mainly *Basic Non Ferrous Metal Manufacturing*.
- *Utilities (\$20 million)* mainly *Gas Supply and Water Supply, Sewerage and Drainage Services*.
- *Transport, Postal and Warehousing (\$17 million)* mainly *Road Transport*.

In combination these five industries accounted for \$682M in total or 95% of the total exports by industry in the region (REMPPLAN, 2025).

In terms of value-added, the ANZSIC one-digit industry sectors of *Agriculture/Forestry/Fishing, Mining, Rental, Hiring and Real Estate Services, Education and Training*, and *Health Care and Social Assistance*, had the highest value-added in total, equal to approximately 72 per cent of the regional economy and 60% of regional employment - **Table 3.6**.

Table 3.6 - Gross Value Added for the 5 Largest Industries in the regional economy (ANZSIC One Digit)

Industry	Gross Value Added (\$m)	Proportion of Regional Economy (%)	Proportion of Regional Employment (%)
Agriculture/Forestry/ Fishing	158	31	31
Mining	92	18	8
Rental, Hiring & Real Estate Services	63	12	0
Education & Training	29	6	11
Health Care & Social Assistance	28	5	10
Total	371	72	60

Source: REMPLAN (2025)

4 CONSTRUCTION IMPACTS

4.1 Project economic activity

4.1.1 Impacts

The estimated direct and indirect regional economic impact of \$74 M expenditure in the regional and NSW economy is reported in **Tables 4.2** and **4.3**.

Table 4.2 – Average Annual Economic Impacts of the Construction on the Regional Economy (\$2025)

	Direct	Production induced	Consumption induced	Total Flow on	TOTAL EFFECT
OUTPUT (\$M)	74	20	3	23	97
<i>Type 11A Ratio</i>	1.00	0.27	0.04	0.31	1.31
VALUE ADDED (\$M)	22	14	3	17	38
<i>Type 11A Ratio</i>	1.00	0.65	0.13	0.78	1.78
INCOME (\$M)	16	2	0	3	18
<i>Type 11A Ratio</i>	1.00	0.14	0.03	0.17	1.17
EMPL. (No.)	123	36	9	45	168
<i>Type 11A Ratio</i>	1.00	0.29	0.07	0.36	1.36

Note: Totals may have minor discrepancies due to rounding.

Table 4.3 – Average Annual Economic Impacts of the Construction on the NSW Economy (\$2025)

	Direct	Production induced	Consumption induced	Total Flow on	TOTAL EFFECT
OUTPUT (\$M)	74	64	21	85	159
<i>Type 11A Ratio</i>	1.00	0.87	0.29	1.15	2.15
VALUE ADDED (\$M)	22	49	19	68	89
<i>Type 11A Ratio</i>	1.00	2.29	0.86	3.15	4.15
INCOME (\$M)	16	10	3	13	29
<i>Type 11A Ratio</i>	1.00	0.62	0.22	0.83	1.83
EMPL. (No.)	123	112	54	166	289
<i>Type 11A Ratio</i>	1.00	0.91	0.44	1.35	2.35

Note: Totals may have minor discrepancies due to rounding.

In estimating the average annual regional impacts, it is important to separate the flow-on effects that are associated with firms buying goods and services from each other (production-induced effects) and the flow-on effects that are associated with employing people who subsequently buy goods and services as households (consumption-induced effects). This is because these two effects operate in different ways and have different spatial impacts.

Production-induced effects occur in a near-proportional way within a region, whereas the consumption-induced flow-on effects only occur in a proportional way if workers and their families are in the region or migrate into the region. Where workers commute from outside the region, some of the consumption-induced flow-on effects leak from the region.

It is estimated that approximately 30% of the construction workforce would be sourced from the region, with the remainder residing outside the region and commuting to the worker accommodation camp.

Based on the above, it is assumed for this analysis that approximately 70% of the consumption induced expenditure leaks from the region. Consequently, **Table 4.2** has been adjusted to only include 30 per cent of consumption-induced flow-ons. A total of 54% of the workforce are assumed to come from NSW and so 54% of consumption induced impacts are included in **Table 4.3**.

The average annual construction impacts of the Project on the regional economy are estimated at up to:

- \$97 M in annual direct and indirect output.
- \$38 M in annual direct and indirect value added.
- \$18 M in annual direct and indirect household income.
- 168 direct and indirect jobs.

The average annual construction impacts of the Project on the NSW economy are estimated at up to:

- \$159 M in annual direct and indirect output.
- \$89 M in annual direct and indirect value added.
- \$29 M in annual direct and indirect household income.
- 289 direct and indirect jobs.

The impacts are larger for the NSW economy because there is less leakage of direct and indirect expenditure out of the NSW economy compared to the regional economy and hence greater production induced and consumption induced flow-on effects.

4.1.2 Multipliers

Multipliers are summary measures used for predicting the total impact on all industries in an economy from changes in the demand for the output of any one industry (ABS, 1995). There are many types of multipliers that can be generated from IO analysis (refer to Attachment 2). Type 11A ratio multipliers summarise the total impact on all industries in an economy in relation to the initial own sector effect e.g., total income effect from an initial income effect and total employment effect from an initial employment effect, etc.

At the regional level, the adjusted type 11A ratio multipliers for the construction workforce of the Project range from 1.17 for income up to 1.78 for value added. The NSW type 11A ratio multipliers for the construction workforce range from 1.83 for income up to 4.15 for value added. The multipliers are large for the NSW economy because of the greater level of intersectoral linkages in the larger economy and hence larger level of flow-on impacts i.e., less leakages compared to the regional economy.

4.1.3 Main sectors affected

The IO analysis indicates construction is most likely to directly impact the *Heavy and Civil Engineering Construction Sector*, *Construction Services Sector* and *Non-Residential Building Construction Sector*. Flow-on impacts from the construction of the Project are likely to affect several different sectors of the regional and NSW economy.

The sectors of the regional economy most impacted by output, value-added, income and employment production induced flow-ons are likely to be as follows:

- *Construction Services.*
- *Professional, Scientific and Technical Services.*
- *Wholesale and Retail Trade.*
- *Road Transport.*
- *Transport Support Services and Storage.*
- *Automotive Repairs and Maintenance.*
- *Structural Metal Product Manufacturing.*

For the NSW economy the *Finance sector*, and *Auxiliary Finance and Insurance sector*, are also important production induced flow-on sectors.

Consumption induced flow-on effects in the region will be mainly in the following sectors:

- *Retail and Wholesale Trade.*
- *Food and Beverage Services.*
- *Health Care Services.*
- *Actual Rent for Housing.*
- *Primary and Secondary Education.*
- *Residential Care and Social Assistance.*
- *Automotive Repairs and Maintenance.*
- *Personal Services.*

For the NSW economy the *Finance; Professional, Scientific and Technical Services; Insurance and Superannuation; Employment, Travel Agency and Other Administrative Services*, are also important consumption induced flow-on sectors.

Businesses that can provide the inputs to the production process required by the construction contractor and/or the products and services required by the workforce would directly benefit from the project by way of an increased economic activity. However, because of the inter-linkages between sectors, many indirect businesses also benefit.

4.2 Benefit sharing

Positive outcomes for the regional economy will be enhanced via the preparation and implementation of a benefits scheme. Consistent with the Benefit-Sharing Guideline (DPHI, 2024), the proposed benefit sharing includes a contribution of \$1,050 per MW per annum to administered and distributed by Narromine Council via a planning agreement under section 7.4 of the EP&A Act 1979.

4.3 Temporary accommodation camp

Construction of the temporary worker accommodation would result in spending in the *Non-Residential Building Construction* sector which includes construction of non-residential buildings such as hotels, motels, hospitals and industrial buildings. The impacts from construction of the temporary worker accommodation are a subcomponent of the impact of the Project in **Section 4.1**. This assessment assumed that 70% of the required direct construction workforce for the project would reside in the temporary workforce accommodation and that none of the wages of these people would be spent in the regional economy. However, some portion of construction workforce wages may be spent in the regional economy. Overall, construction of the temporary worker accommodation would represent a minor component of overall construction impacts and has not been assessed separately.

The operation of the temporary worker accommodation during the construction phase may also potentially have some regional economic impacts from purchases of goods and services from the regional economy. In this respect, the worker accommodation operator would have certain targets in relation to procurement of local goods and services. However, there may be a limit to local procurement because of local unavailability of required inputs. Notwithstanding, some regional businesses may be able to supply some of the non-labour inputs to production.

4.4 Agricultural impacts

The construction of the Project will impact 562.1 ha of agricultural land which could be used for grazing and cropping. The loss of gross income on this land during operation of the Project is \$261,290 per annum (Tremain Ivey Advisory, 2025).

Using revenue, expenditure and employment ratios in the *Sheep, Grain, Beef and Dairy Cattle* sector of the regional and NSW IO table, the direct and indirect impact of this level of revenue is summarised in **Tables 4.5** and **4.6**. Indirect impacts include economic activity associated with suppliers to agricultural production. These impacts would occur for approximately 24 months.

Table 4.5 Annual Regional Economic Impacts of Foregone Agriculture During Project Construction (\$2025)

	Direct	Production induced	Consumption induced	Total Flow on	TOTAL EFFECT
OUTPUT (\$M)	0.26	0.05	0.01	0.05	0.31
<i>Type 11A Ratio</i>	1.00	0.18	0.03	0.20	1.20
VALUE ADDED (\$M)	0.18	0.03	0.01	0.04	0.22
<i>Type 11A Ratio</i>	1.00	0.18	0.04	0.22	1.22
INCOME (\$M)	0.01	0.00	0.00	0.00	0.02
<i>Type 11A Ratio</i>	1.00	0.29	0.07	0.36	1.36
EMPL. (No.)	0.26	0.08	0.02	0.10	0.36
<i>Type 11A Ratio</i>	1.00	0.31	0.08	0.39	1.39

Table 4.6 Annual NSW Economic Impacts of Foregone Agriculture During Project Construction (\$2025)

	Direct	Production induced	Consumption induced	Total Flow on	TOTAL EFFECT
OUTPUT (\$M)	0.26	0.10	0.03	0.13	0.39
<i>Type 11A Ratio</i>	1.00	0.37	0.12	0.49	1.49
VALUE ADDED (\$M)	0.19	0.08	0.03	0.11	0.29
<i>Type 11A Ratio</i>	1.00	0.41	0.15	0.56	1.56
INCOME (\$M)	0.01	0.01	0.01	0.02	0.03
<i>Type 11A Ratio</i>	1.00	0.95	0.36	1.31	2.31
EMPL. (No.)	0.26	0.17	0.08	0.25	0.51
<i>Type 11A Ratio</i>	1.00	0.66	0.32	0.98	1.98

The annual regional direct and indirect impact of foregone agriculture during Project construction is estimated at up to:

- \$0.31 M in annual direct and indirect regional output.
- \$0.22 M in annual direct and indirect regional value-added.
- \$0.02M in annual direct and indirect household income.
- 0.36 direct and indirect jobs.

This represents less than 0.15% of direct agricultural economic activity in the region.

It is evident from the above that agricultural impacts from the construction of the Project are negligible.

4.5 Other impacts

The construction of the project would create demand for regional labour resources and regional inputs to production. Where there is excess capacity in the regional economy, or the region has access to labour and other resources from outside the region this demand would increase economic activity in the region as per the above analysis.

Non-marginal changes in labour demand from an individual project can in the short run potentially lead to increased construction wages, attraction of workers from other relevant sectors of the economy leading to labour shortages in these other areas of the economy (and associated shortages of goods and services), rising costs as firms pass wage costs onto consumers etc. The extent of these impacts for regional economies would depend on the balance of labour supply from inside the region and outside the region (DIDO/ FIFO), as well as adjustment of the overall labour market to respond to increased demand (e.g. increased labour force participation, decrease in out migration). In addition, in the short run excess demand for inputs to construction of an individual project such as quarry materials, concrete etc can result in rising costs for these factor inputs and potentially shortages for other uses.

Regional employment growth, accompanied by in-migration of labour, may also increase demand for short-term and long-term accommodation. This can lead to higher housing prices, rising rents, and reduced short-term accommodation for tourism or other uses. The extent of housing price impacts for regional economies would depend on the level of in-migration of labour seeking local accommodation in between shifts (during which they are accommodated in the accommodation camp), as well as the level of availability of accommodation options, and the adjustment of the accommodation supply in response to increased demand. Early provision of accommodation options can reduce housing price impacts.

Notwithstanding, whether, and the extent to which these types of effects would arise from an individual project is uncertain. For instance, a study by Deloitte Access Economics (2011) of the construction and operation of a large coal mine (with increased demand for labour and housing in the region) found no evidence of price rises (house prices, rents, or groceries) in the Singleton economy relative to non-mining regional economies. In any case, any "crowding out" of other economic activities represents the operation of the market system where scarce resources are reallocated to where they are most highly valued and where society would benefit the most from them. This reallocation of resources is therefore a positive thing for the economy not a negative. Notwithstanding, it may be associated with social impacts.

5 OPERATION BENEFITS AND IMPACTS

5.1 Project benefits

The Australian and State Governments are managing significant changes in electricity generation within the NEM. As Australia progresses towards a net zero emissions goal, coal-fired and other fossil fuel-based generation are being replaced by renewable energy sources, energy storage, and other forms of firming capacity.

By adding up to 236 MW of clean wind generation alongside a 200 MW / 400 MWh battery, the Wallaby Creek Wind Farm will boost zero-emissions electricity supply to the NEM. This will help the transition away from fossil fuel sources, reduces overall carbon intensity, and suppresses wholesale prices, ultimately benefiting consumers.

The co-located battery will provide grid-support services such as frequency control and firming capacity, which will enhance the stability and reliability across the NEM.

Strategically situated near the a point of connection to the grid in Narromine, , the Project strengthens transmission efficiency and aligns NSW's broader Renewable Energy Zone (REZ) strategy—clustering clean energy assets to optimize infrastructure and reduce development costs.

The Project is therefore an integral component of the NSW Electricity Strategy which aims to deliver reliable, affordable and sustainable electricity systems for NSW.

5.2 Project economic activity

5.2.1 Impacts

On this basis the total and disaggregated average annual impacts of the Project on the regional and NSW economy (in 2025 dollars) is shown in **Tables 5.1** and **5.2**.

Table 5.1 – Annual Economic Impacts of the Project on the Regional Economy (\$2025)

	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	TOTAL EFFECT
OUTPUT (\$M)	79	3	0	3	82
<i>Type 11A Ratio</i>	1.00	0.04	0.01	0.04	1.04
VALUE ADDED (\$M)	70	2	0	2	73
<i>Type 11A Ratio</i>	1.00	0.03	0.01	0.03	1.03
INCOME (\$M)	0.6	0.3	0.1	0.3	1.0
<i>Type 11A Ratio</i>	1.00	0.42	0.08	0.50	1.50
EMPL. (No.)	5	4	1	5	10
<i>Type 11A Ratio</i>	1.00	0.72	0.23	0.95	1.95

Table 5.2 – Annual Economic Impacts of the Project on the NSW Economy (\$2025)

	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	TOTAL EFFECT
OUTPUT (\$M)	79	8	2	10	88
<i>Type 11A Ratio</i>	1.00	0.10	0.03	0.12	1.12
VALUE ADDED (\$M)	70	6	2	8	78
<i>Type 11A Ratio</i>	1.00	0.09	0.03	0.11	1.11
INCOME (\$M)	0.6	1.1	0.3	1.4	2.1
<i>Type 11A Ratio</i>	1.00	1.76	0.52	2.27	3.27
EMPL. (No.)	5	12	5	17	22
<i>Type 11A Ratio</i>	1.00	2.36	1.04	3.40	4.40

The Project operation is estimated to make up to the following total annual contribution to the regional economy:

- \$82 M in annual direct and indirect regional output.
- \$73 M in annual direct and indirect regional value-added.
- \$1 M in annual direct and indirect household income.
- 10 direct and indirect jobs.

The Project operation is estimated to make up to the following total annual contribution to the NSW economy:

- \$88 M in annual direct and indirect regional output.
- \$78 M in annual direct and indirect regional value-added.
- \$2.1 M in annual direct and indirect household income.
- 22 direct and indirect jobs.

The impacts are larger for the NSW economy because there is less leakage of direct and indirect expenditure out of the NSW economy compared to the regional economy.

5.2.2 Multipliers

The Type 11A ratio multipliers for the Project's impact on the regional economy range from 1.03 for value-added up to 1.95 for employment. Capital intensive developments tend to have a high level of linkage with other sectors in an economy thus contributing relatively high rates of flow-on employment and income while at the same time only having a lower level of direct employment and income (relative to output levels). This tends to lead to a relatively high ratio multiplier for employment and income. The Project also has a relatively low ratio multiplier for output and value-added reflecting the relatively high direct output and value-added compared to that in flow-on sectors.

The NSW Type 11A ratio multipliers for the Project range from 1.11 for value-added up to 4.40 for income and employment. The multipliers are larger for the NSW economy because of the greater level of intersectoral linkages in the larger economy and hence larger level of flow-on impacts i.e. less leakages compared to the regional economy.

5.2.3 Main Sectors Affected

The sectors of the regional economy most impacted by output, value-added, income and employment production induced flow-ons are likely to be as follows:

- *Electricity Transmission, Distribution, On Selling and Electricity Market Operation.*
- *Wholesale Trade.*
- *Retail Trade.*
- *Professional, Scientific and Technical Services.*
- *Specialised and other Machinery and Equipment Manufacturing.*
- *Building Cleaning, Pest Control and Other Support Services.*
- *Road Transport.*
- *Non Residential Property Operators and Real Estate Services.*

For the NSW economy the *Computer Systems Design and Related Services* sector, *Finance* sector and *Insurance and Superannuation Funds* sector are also an important production induced flow-on sectors.

Consumption induced flow-on effects in the region will be mainly in the following sectors:

- *Retail and Wholesale Trade.*

- *Food and Beverage Services.*
- *Health Care Services.*
- *Actual Rent for Housing.*
- *Primary and Secondary Education.*
- *Residential Care and Social Assistance.*
- *Primary and Secondary Education Services.*
- *Automotive Repairs and Maintenance.*

For the NSW economy the *Finance; Insurance and Superannuation Funds; Professional, Scientific and Technical Services; and Employment, Travel Agency and Other Administrative Service* sectors are also important consumption induced flow-on sectors.

5.2.4 Worker accommodation

The temporary workers accommodation would not operate during the operation phase of the Project and hence no regional or NSW economic impacts would occur.

5.3 Agricultural impacts

The operation of the Project will impact 530.6 ha of agricultural land which could be used for grazing and cropping. The loss of gross income on this land during operation of the Project is \$246,696 per annum (Tremain Ivey Advisory, 2025).

Using revenue, expenditure and employment ratios in the *Sheep, Grain, Beef and Dairy Cattle* sector of the regional and NSW IO table, the direct and indirect impact of this level of revenue is summarised in **Tables 5.3** and **5.4**. Indirect impacts include economic activity associated with suppliers to agricultural production. These impacts would occur for the duration of the Project operation.

Table 5.3 Annual Regional Economic Impacts of Foregone Agriculture During Project Operation (\$2025)

	Direct	Production induced	Consumption induced	Total Flow on	TOTAL EFFECT
OUTPUT (\$M)	0.25	0.04	0.01	0.05	0.30
<i>Type 11A Ratio</i>	1.00	0.18	0.03	0.20	1.20
VALUE ADDED (\$M)	0.17	0.03	0.01	0.04	0.21
<i>Type 11A Ratio</i>	1.00	0.18	0.04	0.22	1.22
INCOME (\$M)	0.01	0.00	0.00	0.00	0.02
<i>Type 11A Ratio</i>	1.00	0.29	0.07	0.36	1.36
EMPL. (No.)	0.24	0.08	0.02	0.10	0.34
<i>Type 11A Ratio</i>	1.00	0.31	0.08	0.39	1.39

Table 5.4 Annual NSW Economic Impacts of Foregone Agriculture During Project Operation (\$2025)

	Direct	Production induced	Consumption induced	Total Flow on	TOTAL EFFECT
OUTPUT (\$M)	0.25	0.09	0.03	0.12	0.37
<i>Type 11A Ratio</i>	1.00	0.37	0.12	0.49	1.49
VALUE ADDED (\$M)	0.18	0.07	0.03	0.10	0.28
<i>Type 11A Ratio</i>	1.00	0.41	0.15	0.56	1.56
INCOME (\$M)	0.01	0.01	0.00	0.02	0.03
<i>Type 11A Ratio</i>	1.00	0.95	0.36	1.31	2.31
EMPL. (No.)	0.24	0.16	0.08	0.24	0.48
<i>Type 11A Ratio</i>	1.00	0.66	0.32	0.98	1.98

These annual agricultural impacts are minor.

5.4 Other impacts

The operation of the Project will create a very small demand for regional labour resources (five direct jobs in a labour market of 2,773) and regional inputs to production (that from the IO analysis represent 1% of interindustry transactions in the region). Consequently, no material “crowding out” effects on other industry sectors are anticipated.

6 DECOMMISSIONING IMPACTS

At the end of the operating life of the Project the proponent may:

- replace the wind turbines with new technology (subject to landholder agreements, planning approvals and the condition of the equipment).
- decommission the project and remove wind turbines and associated infrastructure.

At this stage it is not known which of these options will be adopted.

However, from an economic impact perspective both will provide stimulus to the regional and NSW economy via spending on inputs to refurbishment or decommissioning, and demand for labour and associated wage expenditure. These economic impacts would only be short-term and less than those associated with the construction of the Project.

7 CUMULATIVE IMPACTS

7.1 Approach to cumulative impacts

The cumulative impact assessment approach involves considering the impacts of the Project together with the impacts of other relevant future projects on economic activity. Relevant major projects within 100 km of the Project Area with the potential for cumulative impacts with the Project are identified in **Table 6.1**.

The cumulative impact of multiple projects in the region, NSW and Australia will see the magnification of impacts addressed in this report and competition for resources. These are discussed qualitatively below based on general principles of supply and demand and reference to available reports on cumulative impacts of regional projects.

Table 6.1 Significant Projects in the Region

SD/SSI Application Number	Project Name
SSD-50701505	Narromine Battery Energy Storage System
SSD-451258	Forest Glen Solar Farm
SSD-9176045	Tomingley Gold Extension Project
SSD-8777	Maryvale Solar Farm
SSI-7475	Inland Rail Parkes to Narromine
SSI-9487	Inland Rail Narromine to Narrabri
SSD-8696	Suntop Solar Farm
SSD-6785	Gilgandra Solar Farm
SSD-55968733	Burroway Solar Farm
[pending]	Burroway Wind Farm

7.2 Potential cumulative impacts

7.2.1 Initial cumulative labour stimulus

The main cumulative economic impact of these projects (and other regional projects that are not related to energy) is to generate a large demand for a suitably qualified construction workforce in the region.

This labour demand will be met from:

- the region:
 - the unemployment pool.
 - increased labour force participation.
 - workers from other industries.
- the rest of NSW and Australia, with labour:
 - moving into the region to live during the employment period; or
 - commuting from outside the region e.g. FIFO and DIDO.
- In-migration of overseas labour.

7.2.2 Population impact

It is unlikely all the cumulative labour demand can be met from the existing residents of the region, only. To the extent that the cumulative job stimulus results in workers (and their families) relocating to regional

areas, even temporarily, or workers from the region not emigrating from the region in search of work, this can provide population growth (or abate population decline). Trends in regional economies of NSW (because of globalization and associated structural adjustment) has resulted in many non-coastal rural areas in NSW, including Narromine LGA, experiencing population decline.

Population growth is an important driver of the health of regional economies. Places that can attract population immigration create increased demand for goods and services and thus more jobs. This growth leads to increasing local multiplier effects, scale economies and an increase in the rate of innovation and capital availability (Sorensen, 1990). Conversely, population losses can contribute to a 'vicious cycle' of decline whereby reduced populations results in closure of services, which in turn makes it difficult to attract new populations (Sorensen 1990).

7.2.3 Accommodation impacts

Cumulative regional population changes driven by cumulative regional employment growth will increase demand for short-term and long-term accommodation. The impacts can be increases in housing prices and rents, and shortages of short-term accommodation that might otherwise be used for tourism or other purposes.

From an economic perspective, increases in the cost of housing are predominantly a transfer between local owners and renters, or local owners and buyers. The existing homeowners and accommodation providers of the property benefit when this happens, and the renters/buyers experience increased costs (DAE, 2012). However, price rises also impact lower income households who may get squeezed out of the market. In situations where there are no market distortions, and cumulative population changes are longer term, the local housing supply would normally adjust to demand and prices return to their previous levels (DAE, 2012). However, given the more temporary nature of population change, normal longer term housing supply adjustments may be tempered and so there may be a need to encourage and facilitate the provision of additional accommodation including temporary workforce camps (as proposed for this Project), adaptive reuse or extension of existing buildings, use of existing granny flats and spare bedrooms, use of vacant housing etc.

The extent of residual housing price impacts for regional economies would depend on the balance of labour supply from inside the region, outside the region and DIDO/FIFO, the level of provision of workforce accommodation camps across multiple projects, and other accommodation options, as well as adjustment of the overall housing supply in response to increased demand. Early provision of additional accommodation can reduce housing price impacts.

7.2.4 Regional job growth

Cumulative demand for labour in regional areas can help address the jobs growth imbalance between Australia's biggest cities which have grown by an average of 2.4 per cent per annum since 2000 and the regions which have grown at 1.0 per cent per annum (Sobyra, 2022). This imbalance has been attributed to the economy creating relatively more demand for high skilled jobs than previously with the vast majority of these located in big cities rather than regions (Sobyra, 2022).

Regional jobs growth from the cumulative project demand can partly offset this trend by providing opportunities for the existing and future regional workforces, attracting middle-and high-skilled workers and families to regional areas, reducing outmigration of the regional workforce to look for employment in cities, and increase regional labour force participation. Regional projects can therefore provide a boom to non-coastal regional economies that have experienced low growth or decline because of globalisation and associated structural adjustment.

7.2.5 Stimulus to regional economic activity

Cumulative projects in regional NSW will provide a substantial boost in direct economic activity in the region as well as flow-on economic activity to businesses that are able to supply the goods and services:

- required for project construction and operation; and
- demanded by workers i.e. expenditure of wages.

Based on the Economic Assessment in **Sections 4** and **5**, cumulative project construction is most likely to directly impact the heavy and civil engineering construction sector, construction services sector and non-residential building construction sector, and will indirectly impact a range of sectors.

However, any business that can provide the goods and services demanded for project construction and operation, and by workers, will benefit from the cumulative economic activity.

7.2.6 Impacts on other sectors of the economy

Notwithstanding the above, increased demand for construction workers can in the short run lead to increased construction sector (and other sector) wages, attraction of workers from other relevant sectors of the economy leading to labour shortages in these other areas of the economy (and associated shortages of goods and services), rising costs as firms pass wage costs onto consumers etc.

In addition, in the short run, excess demand for inputs to construction such as quarry materials, concrete etc can result in rising costs (prices) for these factor inputs and potentially shortages for other uses. The extent of these short run impacts for regional economies would depend on the balance of labour supply from inside the region, outside the region and DIDO/FIFO, as well as adjustment of the overall labour market, and other markets, in response to increased demand. However, in the short to medium term markets will adjust to some extent (e.g. increased labour force participation, new quarry proposals to supply demand for aggregate etc) and enable wages and prices to return to previous levels.

Notwithstanding, any price increases and crowding out of other economic activities in the region represents the operation of the market system where scarce resources are reallocated to where they are most highly valued and where society would benefit the most from them. This reallocation of resources is therefore a positive thing for the economy not a negative. Notwithstanding, it may be associated with social impacts.

7.2.7 Agricultural impacts

The economic assessment in **Sections 4** and **5**, found that the negative regional economic impacts from the use of agricultural land for the Project, were very small, and small in comparison to the positive regional economic activity from the Project. This finding reflects the small disturbance footprint of the Project and the lower value agricultural activity being impacted.

These findings are likely to be the same across most renewable energy projects e.g. for wind farm projects turbine location tends to be on low land capability soils while grazing can continue between and under turbines. The cumulative impact of projects on the regional economic activity of agriculture is therefore likely to be minor. The minor cumulative impact will also be temporary. This is due to the Project and other renewable energy projects in the region decommissioning project infrastructure once the operational life has ceased. The land will then be rehabilitated and made good for agricultural land uses.

7.2.8 Mitigation measures

The magnitude and duration of cumulative wage, price and supply shortages will largely depend on the ability of the labour, housing, and other markets to make supply adjustments.

Greater use of FIFO/DIDO and workforce accommodation will reduce impacts on the regional labour market (wage increases and labour shortages) and accommodation market (price/rent increases) but will also reduce regional economic activity benefits, because FIFO/DIDI workers will repatriate most of their income back to their home region.

The ability of the labour, housing, and other markets to make timely supply adjustments, may in some instances (e.g. housing supply adjustments, new quarry proposals) be impacted by local planning systems, and so Governments should be cognisant of the planning required to facilitate market adjustments in housing and other markets.

8 MITIGATION AND MANAGEMENT MEASURES

It is evident from **Section 4** and **5** that the economic activity associated with the construction and operation of the Project would outweigh the loss of economic activity from the minor and temporary impact on agricultural production. However, at the same time it would create a demand for a suitably qualified construction workforce in the region.

The Proponent will work in partnership with the local council and community to help maximise the projected economic regional benefits whilst minimising any impacts. In this respect, a range of general economic mitigation and management measures are proposed and would include:

- Employment of regional residents where they have the required skills and experience.
- Participation, as appropriate, in business groups, events or programs in the regional community.
- Locally sourcing non-labour inputs to production where local producers can be cost and quality competitive.
- Preparation and implementation of a benefits sharing scheme administered and distributed by Narromine Council via a planning agreement with the intention of supporting local non-profit organisations, community programs/events, local businesses, training, and services/infrastructure.
- Lease payments to host landowners that provide an alternative drought proof income with potential flow-on benefits to the regional economy.
- Continued agricultural activities during the operational phase of the Project and reinstatement of full pre-project agricultural production following project decommissioning.

The Agricultural Impact Assessment and the Social Impact Assessment provide additional management measures which are relevant to the impacts discussed in this report.

9 CONCLUSION

By adding up to 236 MW of clean wind generation alongside a 200 MW / 400 MWh battery, the Wallaby Creek Wind Farm will boost electricity supply to the NEM. This will help the transition away from fossil fuel sources, reduces overall carbon intensity, and suppress wholesale prices, ultimately benefiting consumers. The co-located battery will provide grid-support services such as frequency control and firming capacity, which will enhance the stability and reliability across the NEM.

The Project will also provide economic activity to the regional economy during both the construction, operation and decommissioning phase. It would also result in a minor and insignificant contraction in regional economic activity from agricultural activity within the development footprint during construction and operation.

The construction and operation of the Project will have net positive impacts on the level of economic activity in the regional and NSW economy.

The Proponent proposes to work in partnership with the local council and the local community so that, as far as possible, the benefits of the projected economic growth in the region are maximised and impacts minimised. In this respect, a range of general economic impact mitigation and management measures are proposed.

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ATTACHMENT 1 – THE GRIT SYSTEM FOR GENERATING INPUT-OUTPUT TABLES

The GRIT system was designed to:

- combine the benefits of survey-based tables (accuracy and understanding of the economic structure) with those of non-survey tables (speed and low cost).
- enable the tables to be compiled from other recently compiled tables.
- allow tables to be constructed for any region for which certain minimum amounts of data were available.
- develop regional tables from national tables using available region-specific data.
- produce tables consistent with the national tables in terms of sector classification and accounting conventions.
- proceed in a number of clearly defined stages.
- provide for the possibility of ready updates of the tables.

The resultant GRIT procedure has a number of well-defined steps. Of particular significance are those that involve the analyst incorporating region-specific data and information specific to the objectives of the study. The analyst has to be satisfied about the accuracy of the information used for the important sectors. The method allows the analyst to allocate available research resources to improving the data for those sectors of the economy that are most important for the study.

An important characteristic of GRIT-produced tables relates to their accuracy. In the past, survey-based tables involved gathering data for every cell in the table, thereby building up a table with considerable accuracy. A fundamental principle of the GRIT method is that not all cells in the table are equally important. Some are not important because they are of very small value and, therefore, have no possibility of having a significant effect on the estimates of multipliers and economic impacts. Others are not important because of the lack of linkages that relate to the particular sectors that are being studied. Therefore, the GRIT procedure involves determining those sectors and, in some cases, cells that are of particular significance for the analysis. These represent the main targets for the allocation of research resources in data gathering. For the remainder of the table, the aim is for it to be 'holistically' accurate (Jensen, 1980). This means a generally accurate representation of the economy is provided by the table, but does not guarantee the accuracy of any particular cell. A summary of the steps involved in the GRIT process is shown in Table A1.1 (Powell and Chalmers, 1995).

Table A1.1**The GRIT Method**

Phase	Step	Action
PHASE I	1	ADJUSTMENTS TO NATIONAL TABLE Selection of national input-output table (1114-sector table with direct allocation of all imports, in basic values).
	2	Adjustment of national table for updating.
	3	Adjustment for international trade.
PHASE II		ADJUSTMENTS FOR REGIONAL IMPORTS (Steps 4-14 apply to each region for which input-output tables are required)
	4	Calculation of 'non-existent' sectors.
	5	Calculation of remaining imports.
PHASE III		DEFINITION OF REGIONAL SECTORS
	6	Insertion of disaggregated superior data.
	7	Aggregation of sectors.
	8	Insertion of aggregated superior data.
PHASE IV		DERIVATION OF PROTOTYPE TRANSACTIONS TABLES
	9	Derivation of transactions values.
	10	Adjustments to complete the prototype tables.
	11	Derivation of inverses and multipliers for prototype tables.
PHASE V		DERIVATION OF FINAL TRANSACTIONS TABLES
	12	Final superior data insertions and other adjustments.
	13	Derivation of final transactions tables.
	14	Derivation of inverses and multipliers for final tables.

Source: Bayne and West (1988).

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ATTACHMENT 2 – UNDERLYING ASSUMPTIONS AND INTERPRETATIONS OF INPUT-OUTPUT ANALYSIS AND MULTIPLIERS

1. “The *basic assumptions* in IO analysis include the following:

- there is a fixed input structure in each industry, described by fixed technological coefficients (evidence from comparisons between IO tables for the same country over time have indicated that material input requirements tend to be stable and change but slowly; however, requirements for primary factors of production, that is labour and capital, are probably less constant).
- all products of an industry are identical or are made in fixed proportions to each other.
- each industry exhibits constant returns to scale in production.
- unlimited labour and capital are available at fixed prices; that is, any change in the demand for productive factors will not induce any change in their cost (in reality, constraints such as limited skilled labour or investment funds lead to competition for resources among industries, which in turn raises the prices of these scarce factors of production and of industry output generally in the face of strong demand).
- there are no other constraints, such as the balance of payments or the actions of government, on the response of each industry to a stimulus.

2. The multipliers therefore describe *average effects, not marginal effects*, and thus do not take account of economies of scale, unused capacity or technological change. Generally, average effects are expected to be higher than the marginal effects.

3. The IO tables underlying multiplier analysis only take account of one form of *interdependence*, namely the sales and purchase links between industries. Other interdependence such as collective competition for factors of production, changes in commodity prices which induce producers and consumers to alter the mix of their purchases and other constraints which operate on the economy as a whole are not generally taken into account.

4. The combination of the assumptions used and the excluded interdependence means that IO multipliers are higher than would realistically be the case. In other words, they tend to *overstate* the potential impact of final demand stimulus. The overstatement is potentially more serious when large changes in demand and production are considered.

5. The multipliers also do not account for some important pre-existing conditions. This is especially true of Type II multipliers, in which employment generated and income earned induce further increases in demand. The implicit assumption is that those taken into employment were previously unemployed and were previously consuming nothing. In reality, however, not all 'new' employment would be drawn from the ranks of the unemployed; and to the extent that it was, those previously unemployed would presumably have consumed out of income support measures and personal savings. Employment, output and income responses are therefore overstated by the multipliers for these additional reasons.

6. The most *appropriate interpretation* of multipliers is that they provide a relative measure (to be compared with other industries) of the interdependence between one industry and the rest of the economy which arises solely from purchases and sales of industry output based on estimates of transactions occurring over a (recent) historical period. Progressive departure from these conditions would progressively reduce the precision of multipliers as predictive device” (ABS 1995, p.24).

To overcome some of the limitations of standard IO analysis, this Project uses the program *EconImp2* which uses marginal technical coefficients rather than average coefficients to assess flow-on impacts and multipliers.

Multipliers indicate the total impact of changes in demand for the output of any one industry on all industries in an economy (ABS, 1995). Conventional output, employment, value-added and income

multipliers show the output, employment, value-added and income responses to an initial output stimulus (Jensen and West, 1986).

Components of the conventional output multiplier are as follows:

Initial effect - which is the initial output stimulus, usually a \$1 change in output from a particular industry (Powell and Chalmers, 1995; ABS, 1995).

First round effects - the amount of output from all intermediate sectors of the economy required to produce the initial \$1 change in output from the particular industry (Powell and Chalmers, 1995; ABS, 1995).

Industrial support effects - the subsequent or induced extra output from intermediate sectors arising from the first round effects (Powell and Chalmers, 1995; ABS, 1995).

Production induced effects - the sum of the first round effects and industrial support effects (i.e. the total amount of output from all industries in the economy required to produce the initial \$1 change in output) (Powell and Chalmers, 1995; ABS, 1995).

Consumption induced effects - the spending by households of the extra income they derive from the production of the extra \$1 of output and production induced effects. This spending in turn generates further production by industries (Powell and Chalmers, 1995; ABS, 1995).

The *simple multiplier* is the initial effect plus the production induced effects.

The *total multiplier* is the sum of the initial effect plus the production-induced effect and consumption-induced effect.

Conventional employment, value-added and income multipliers have similar components to the output multiplier, however, through conversion using the respective coefficients show the employment, value-added and income responses to an initial output stimulus (Jensen and West, 1986).

For employment, value-added and income, it is also possible to derive relationships between the initial or own sector effect and flow-on effects. For example, the flow-on income effects from an initial income effect or the flow-on employment effects from an initial employment effect, etc. These own sector relationships are referred to as ratio multipliers, although they are not technically multipliers because there is no direct line of causation between the elements of the multiplier. For instance, it is not the initial change in income that leads to income flow-on effects, both are the result of an output stimulus (Jensen and West, 1986).

A description of the different ratio multipliers is given below.

Type 1A Ratio Multiplier = $\frac{\text{Initial} + \text{First Round Effects}}{\text{Initial Effects}}$

Initial Effects

Type 1B Ratio Multiplier = $\frac{\text{Initial} + \text{Production Induced Effects}}{\text{Initial Effects}}$

Initial Effects

Type 11A Ratio Multiplier = $\frac{\text{Initial} + \text{Production Induced} + \text{Consumption Induced Effects}}{\text{Initial Effects}}$

Initial Effects

Type 11B Ratio Multiplier = $\frac{\text{Flow-on Effects}}{\text{Initial Effects}}$

Initial Effects

Source: Centre for Farm Planning and Land Management (1989).

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