Romani Battery Energy Storage System
Economic Assessment

Prepared for

Environmental Resource Management Australia Pty Ltd

By

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Introduction

Samsung C&T and Renewable Energy Australia Pty Ltd (the Proponent) proposes to construct, operate and decommission the Romani Battery Energy Storage System (the Project), located approximately 44 kilometres (km) southwest of Hay in the Riverina Murray Region of New South Wales (NSW).

The project is 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.

The Project would provide economic activity to the regional and NSW economy during the construction, operation and decommissioning phases. It would also result in some reduction in regional economic activity from foregone potential agricultural within the disturbance footprint.

Economic activity impacts in the regional and NSW economy arises from:

- direct impact or stimulus of the Project;
- expenditure on non-labour inputs to production – production induced flow-on effects; and
- expenditure of labour wages – consumption induced flow-on effects.

Methodology

These regional and NSW economic impacts are assessed using input-output (IO) analysis. Qualitative consideration is also given to potential impacts of the Project, and cumulative projects, on demand for regional and NSW labour resources and other inputs to production.

Existing environment

The study area/regional economy for this economic impact assessment is defined as the combined local government areas (LGAs) of Edward River and Hay. This is the region that contains the nearest towns of Deniliquin and Hay and would be relevant for providing employment, goods and services and worker housing. 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 population of the region in 2021 was 13,338 and has been contracting at approximately one per cent per annum since 2006. The Edward River LGA accounts for 75 per cent of the total regional population and 75 per cent of the total regional labour force. Aggregated one-digit Australian and New Zealand Industry Classification (ANZSIC) place of work data for the region indicates the significance of the *Agriculture, Forestry and Fishing* sector and the *Health Care and Social Assistance* sector. The *Health Care and Social Assistance* sector is the most significant industry sector for employment the Edward River LGA, followed by the *Agriculture, Forestry and Fishing* sector. In the Hay LGA, the most significant industry sector for employment is the *Agriculture, Forestry and Fishing* sector followed by the *Retail Trade* sector.

Exporting sectors are key drivers of regional economies and reflect a region's endowments and competitive advantages. Using the one-digit ANZSIC, the largest exporting industries in the region by output value are *Agriculture, Forestry and Fishing, Utilities,* and *Manufacturing*.

Potential construction impacts

The construction period is 20 months. The annual construction impacts of the Project on the regional economy are estimated at up to:

- $23M in annual direct and indirect output;
- $8M in annual direct and indirect value added; and
- $5M in annual direct and indirect household income.
- 56 direct and indirect jobs.

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

- $49M in annual direct and indirect output;
- $21M in annual direct and indirect value added;
- $13M in annual direct and indirect household income; and
- 137 direct and indirect jobs.

The above level of impacts on the regional and NSW economy would be felt for the first year of construction, with two thirds this level of impact occurring in the second year of construction (as construction only occurs for eight months of the second year).

The construction phase of the Project would result in a temporary reduction in around 20 ha of land available for agricultural activity – sheep grazing. 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 would create demand for regional labour resources and regional inputs to production which is unlikely to result in any observable regional wages and price increases.

Potential operational impacts

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

- $7M in annual direct and indirect regional output;
- $2M in annual direct and indirect regional value-added;
- $1M in annual direct and indirect household income; and
- 10 direct and indirect jobs.

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

- $10M in annual direct and indirect regional output;
- $4M in annual direct and indirect regional value-added;
- $2M in annual direct and indirect household income; and
- 21 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 Project operation would have minor agricultural impacts.

The operation of the Project would 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 would 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), rising prices as firms pass wage costs onto consumers. The extent of these impacts for regional economies would 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 would 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;
- Establishment of a Community Benefit Fund to be managed through a Voluntary Planning Agreement with Councils 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; and
- Reinstatement of full pre-project agricultural capability following project decommissioning.

1 INTRODUCTION

1.1 Project overview

Gillespie Economics was engaged by ERM Australia Pty Ltd to conduct an Economic Assessment of the Romani Battery Energy Storage System (BESS) (the Project) for Samsung C&T and Renewable Energy 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) Development Consent approval under Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (SSD- 67105475), as part of the Environmental Impact Statement (EIS) for the Project.

The Project is located approximately 44 kilometres (km) southwest of Hay in the Riverina Murray Region of New South Wales (NSW). The entire Project Area is within the Edward River Local Government Area (LGA). The land is predominantly used for agricultural purposes (sheep grazing). The Project Area covers approximately 20 hectares (ha).

The Project would involve the construction, operation, and decommissioning of a BESS and associated infrastructure. This includes:

- a lithium-ion BESS with a storage capacity of 200 MW / 800 MWh;
- an electrical reticulation network that is comprised of a 220 kV substation and grid connection to the existing X5 transmission line;
- a 220 kV power transformer with a height of approximately 6m;
- a permanent O&M compound, control building / control room, switch room with a height of approximately 5m;
- landscaping works, asset protection zones, access tracks, drainage; and
- vehicle access to/from Booroorban-Tchelery Road.

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 19 June 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:	
an assessment of the economic impacts or benefits of the project for the region and the State as a whole, and	Chapters 4, 5, 6 and 7 of this report.
provide details of any proposed voluntary benefit sharing, having regard for the Benefit-Sharing Guideline 2024 and Private Agreement Guideline 2024	See the Social Impact Statement

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 BESS 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 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; and
- Section 9 provides the conclusions of the assessment.

2 Methodology

2.1 Overview

The Project would 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 located in Edward River LGA which contains the town of Deniliquin. However, the town of Hay (within the Hay LGA) is only 44 km to the northeast. Deniliquin and Hay are the nearest towns to the Project, and it is anticipated that both would be relevant for providing employment, goods and services and 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 therefore defined as the combined LGAs of Edward River and Hay. While the region is the focus of the analysis, impacts on the NSW economy are also assessed.

2.3 Description of 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] 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 Input Output Tables (GRIT) procedure developed by the University of Queensland and recognised internationally - Refer to Attachment 1; and
- 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 and production ratios in the IO tables. Indirect effects were estimated using the *EconImp* program.[2]

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;

[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] The EconImp program uses the Leontif Inverse Matrix to estimate indirect effects.

- Income – the wages paid to employees including imputed wages for self-employed and business owners; and
- Employment – the number of people employed (including self-employed, full-time, and part-time).

The IO method is based on several assumptions that are outlined in Attachment 2. Most 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 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.

The consequence of the assumptions of IO analysis, is that IO modelling provides an upper bound estimate of the gross economic impact or footprint of the Project which is also an upper bound estimate of net economic activity impacts.

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

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.

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 11,338 and a labour force of 5,255, with Edward River LGA accounting for 75 per cent of the total population and 75 per cent of the total labour force. The median age of the regional population was 47, eight 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 (5.7 per cent) than NSW (3.4 per cent). The regional population had a lower level of educational attainment than NSW, with 11.3 per cent holding a bachelor's degree or higher, compared to 27.8 per cent for NSW. In the region, the level educational attainment was highest in the Edward River LGA.

In the 2021 Census, 194 people (3.7 per cent of the total regional labour force) were unemployed with the majority of these (72 per cent) located in the Edward River LGA. The median weekly household income in the region was $1,239 compared to $$1,829 for NSW. Median weekly rents in the region were $208 compared to $420 for NSW, and the highest in the Edward River LGA ($220).

The main occupations of usual residents in the region (Figure 3.1) were Managers (including Farm Managers) (20 per cent), Professionals (14 per cent), Labourers (14 per cent) and Technicians and Trade Workers (14 per cent). While Edward River LGA has the greatest number of all occupations, the relative importance of different occupations varied by LGA. In the Edward River LGA the main occupations were Managers, Professionals, and Community Service Workers, while in the Hay LGA the main occupations were Managers, Labourers, and Technician and Trade Workers.

Figure 3.1 – Employment by Occupation of Usual Residents

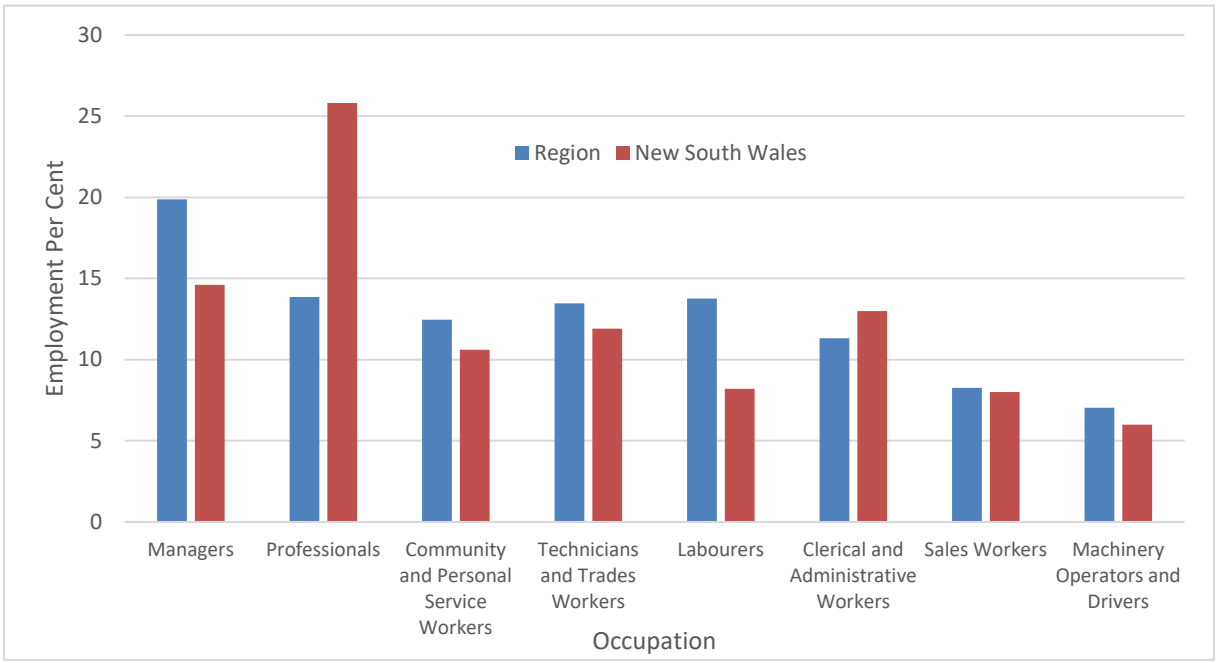


Table 3.1 - Characteristics of Usual Residents

	Edward River LGA		Hay LGA		Total Region		NSW	
Population	8,456		2,882		11,338		8,072,163	
% Aboriginal and/or Torres Strait Islanders	4.8		8.3		5.7		3.4	
Median Age	46		48		47		39	
% of population <15 years	17.4		16.1		17.1		18.2	
% of population 65+	24.9		23.3		24.5		17.7	
In labour force	3,918		1,337		5,255		3,874,012	
Unemployed %	3.6		4.0		3.7		4.9	
No.	140		54		194		189852	
Labour force to population ratio	46.3		46.4		46.3		48.0	
Median household weekly income	$1,240		$1,236		$1,239		$1,829	
Unoccupied private dwellings %	13.6		17.4		14.58		9.4	
No.	523		239		762		299,524	
Median weekly rent	$220		$175		$208		$420	
Level of highest education attainment - 15+	**No.**	**%**	**No.**	**%**	**No.**	**%**	**%**	**No.**
Year 9 or below	883	12.7	326	13.5	1,209	12.9	487,855	7.4
Year 10	1,075	15.4	416	17.2	1,491	15.9	698,390	10.6
Year 12	724	10.4	330	13.7	1,054	11.2	954,987	14.5
Bachelor's degree and above	863	12.4	200	8.3	1,063	11.3	1,838,502	27.8
Occupations	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Managers	728	19.3	256	19.9	984	19.9	536,820	14.6
Professionals	553	14.7	133	10.3	686	13.9	952,131	25.8
Community and Personal Service Workers	495	13.1	122	9.5	617	12.5	390,779	10.6
Technicians and Trades Workers	477	12.6	190	14.8	667	13.5	436,589	11.9
Labourers	453	12.0	228	17.7	681	13.8	300,966	8.2
Clerical and Administrative Workers	426	11.3	134	10.4	560	11.3	480,612	13.0
Sales Workers	299	7.9	110	8.6	409	8.3	294,889	8.0
Machinery Operators and Drivers	251	6.7	97	7.5	348	7.0	222,186	6.0

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. *Sheep Farming (Specialised), Other Social Assistance Services, Hospitals (except Psychiatric Hospitals), Primary Education and Supermarket and Grocery Stores* were the most significant employment sectors for usual residents of the region. *Other Social Assistance Services and Hospitals (except Psychiatric Hospitals)* were the most significant employment sector for usual residents of Edward River LGA while *Sheep Farming (Specialised)* and *Local Government Administration* were the most significant employment sector for residents of the Hay LGA.

Nine per cent of employed usual residents work outside the region, mainly No fixed address (NSW) (4.4 per cent), Murray River (2.1 per cent), Berrigan (0.9 per cent) and Carrathool (0.5 per cent).

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

Edward River LGA	%	Hay LGA	%	Total Region	%	NSW	%
Other Social Assistance Services	4.5	Sheep Farming (Specialised)	7.5	Sheep Farming (Specialised)	3.8	Hospitals (except Psychiatric Hospitals)	4.2
Hospitals (except Psychiatric Hospitals)	3.7	Local Government Administration	4.0	Other Social Assistance Services	3.5	Supermarket and Grocery Stores	2.5
Grain-Sheep or Grain-Beef Cattle Farming	3.3	Primary Education	3.8	Hospitals (except Psychiatric Hospitals)	3.5	Other Social Assistance Services	2.4
Primary Education	3.2	Supermarket and Grocery Stores	3.4	Primary Education	3.3	Computer System Design and Related Services	2.3
Supermarket and Grocery Stores	3.2	State Government Administration	3.1	Supermarket and Grocery Stores	3.3	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 immigration[3] 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 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; and
- 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.

[3] Mainly due to natural endowments and comparative advantage in certain industry sectors.

Against this backdrop, it is evident that the population of the regional economy has been contracting at an average annual rate of -0.9 per cent since 2001, compared to an average annual growth rate of 1.2 per cent for NSW. The contraction in population has been occurring in both the Edward River LGA and the Hay LGA.

Table 3.3 - Population growth

	Population					Average Annual Growth Rate				
Local Government Area	**2001**	**2006**	**2011**	**2016**	**2021**	**2001-2006**	**2006 - 2011**	**2011 - 2016**	**2016 - 2021**	**2006 - 2021**
Edward River LGA	10,074	9,287	8,888	8,991	8,437	-1.6%	-0.9%	0.2%	-1.2%	-0.8%
Hay LGA	3,620	3,483	3,085	2,984	2,883	-0.8%	-2.3%	-0.7%	-0.7%	-1.0%
Total Region	13,694	12,770	11,973	11,975	11,320	-1.3%	-1.2%	0.0%	-1.1%	-0.9%
NSW	6,530,349	6,742,690	7,218,529	7,732,858	8,093,815	0.7%	1.4%	1.4%	0.9%	1.2%

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

The population of the region (Table 3.4) is predicted to continue to contract at an average annual rate of 0.14 per cent, with most of contraction occurring in the Hay LGA (NSW DPE, 2022).

Table 3.4 – Projected population growth

Local Government Area	2021	2041	Change	Annual %
Edward River LGA	9,073	9,012	-61	-0.03%
Hay LGA	2,862	2,594	-268	-0.47%
Total Region	11,935	11,606	-329	-0.14%
NSW	8,166,757	9,872,934	1,706,177	1.04%

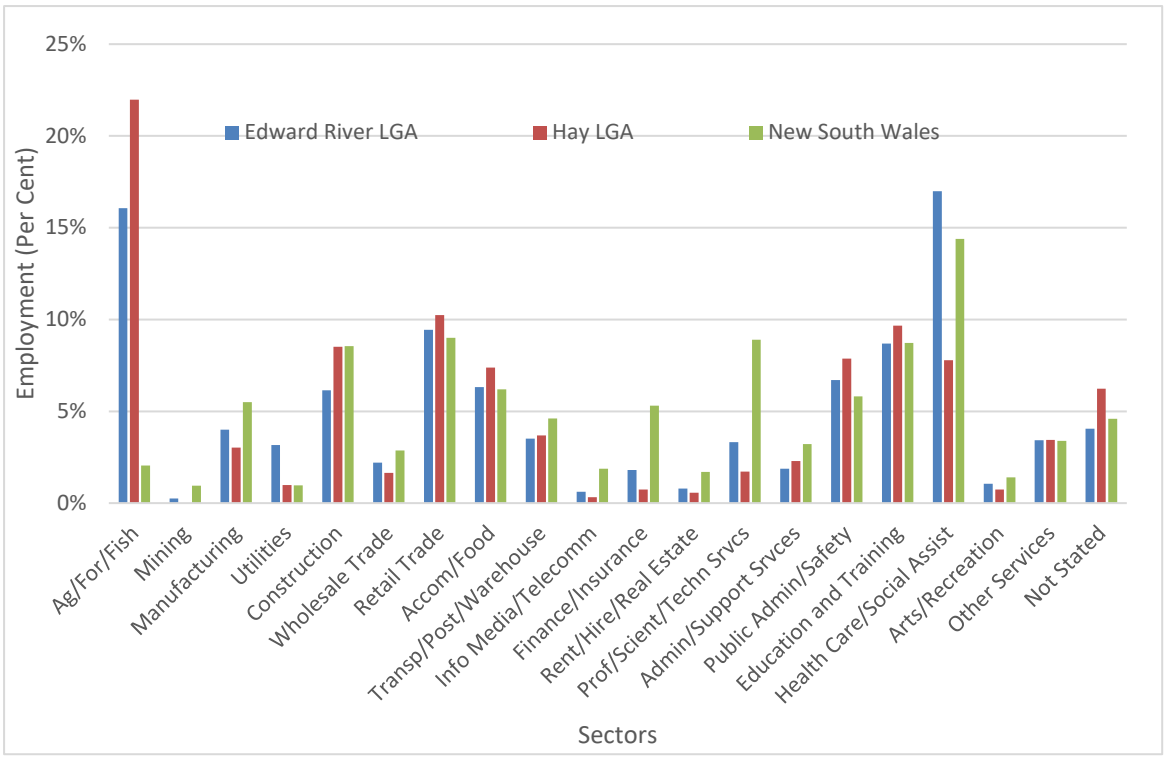
Source: NSW Department of Planning and Environment (2022)

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. The *Agriculture, Forestry and Fishing* sector and *Health Care and Social Assistance* sector are two largest employment sectors in the Edward River LGA, while the *Agriculture, Forestry and Fishing* sector *and Retail Trade* sector are the two largest employment sectors in the Hay LGA.

Eleven per cent of people who work in the region live outside the region, mainly in Murray River (4.3 per cent), and Berrigan (0.8 per cent).

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 *Hospitals (except Psychiatric Hospitals), Other Social Assistance Services, Primary Education, Supermarket and Grocery Stores, and Sheep Farming (Specialised)* (See Table 3.5). *Other Social Assistance Services* and *Hospitals (except Psychiatric Hospitals)* are the two largest employment sectors in Edward River LGA. In the Hay LGA, the two largest employment sectors are *Sheep Farming (Specialised)* and *Local Government Administration.*

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

Edward River LGA	%	Hay LGA	%	Total Region	%	NSW	%
Other Social Assistance Services	4.8	Sheep Farming (Specialised)	7.1	Hospitals (except Psychiatric Hospitals)	3.9	Hospitals (except Psychiatric Hospitals)	4.1
Hospitals (except Psychiatric Hospitals)	4.2	Local Government Administration	4.4	Other Social Assistance Services	3.6	Supermarket and Grocery Stores	2.5
Supermarket and Grocery Stores	3.5	Primary Education	3.9	Primary Education	3.6	Other Social Assistance Services	2.4
Primary Education	3.5	Supermarket and Grocery Stores	3.8	Supermarket and Grocery Stores	3.6	Computer System Design and Related Services	2.3
Grain-Sheep or Grain-Beef Cattle Farming	3.2	Accommodation	3.8	Sheep Farming (Specialised)	3.4	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:

- *Agriculture, Forestry and Fishing ($269 million)* mainly *Sheep, Grains, Beef and Dairy Cattle;*

- *Utilities ($119 million)* mainly *Water Supply, Sewerage and Drainage Services;*
- *Manufacturing ($92 million)* mainly *Petroleum and Coal Product Manufacturing;*
- *Public Administration and Safety ($50 million)* mainly *Public Administration and Regulatory Services; and*
- *Construction ($49 million)* mainly *Heavy and Civil Engineering Construction.*

In combination these five industries accounted for $580 million in total or 79 per cent of the total exports by industry in the region.

In terms of value-added, the ANZSIC one-digit industry sectors of *Agriculture/Forestry/Fishing, Utilities, Heath Care and Social Assistance, Public Administration and Safety and Construction* had the highest value-added in total, equal to approximately 56 per cent of the regional economy and 51 per cent 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	155	22%	18%
Utilities	75	10%	3%
Health Care and Social Assistance	70	10%	15%
Public Administration and Safety	53	7%	8%
Construction	49	7%	7%
Total	**403**	**56%**	**51%**

Source: Gillespie Economics Input Output Table of the Regional Economy

4 CONSTRUCTION IMPACTS

4.1 The Project

The Project would provide economic activity to the regional and NSW economy during both the construction and operation phase. It could also result in some reduction in regional economic activity from foregone agricultural activity within the disturbance footprint.

4.1.1 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; and
- The *Non-Residential Building Construction Sector* which includes businesses engaged in the construction of industrial buildings.

Conservatively, all machinery manufacturing is assumed to occur outside the region/NSW.

Construction is anticipated to occur over an 20-month period with a peak construction workforce of 80 to 100 full-time equivalents (FTE) and an average workforce of 40 full-time equivalents in the first year of construction and this level of average workforce for an additional six months.

Based on the IO coefficients of the abovementioned three construction sectors in the regional IO table, $15M of expenditure would be required across these sectors to generate an average annual construction workforce of 40.

The estimated direct and indirect regional economic impact of $15M 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 ($2024)

	Direct	Production induced	Consumption induced	Total Flow on	TOTAL EFFECT
OUTPUT ($M)	15	7	1	8	23
Type 11A Ratio	1.00	0.48	0.07	0.55	1.55
VALUE ADDED ($M)	6	2	1	2	8
Type 11A Ratio	1.00	0.26	0.11	0.37	1.37
INCOME ($M)	4	1	0	1	5
Type 11A Ratio	1.00	0.25	0.08	0.33	1.33
EMPL. (No.)	40	12	4	16	56
Type 11A Ratio	1.00	0.29	0.11	0.40	1.40

Note: Totals may have minor discrepancies due to rounding.

Table 4.3 – Average Annual Economic Impacts of the Construction on the NSW Economy ($2024)

	Direct	Production induced	Consumption induced	Total Flow on	TOTAL EFFECT
OUTPUT ($M)	15	17	17	34	49
Type 11A Ratio	1.00	1.14	1.13	2.27	3.27
VALUE ADDED ($M)	6	6	9	15	21
Type 11A Ratio	1.00	1.00	1.60	2.60	3.60
INCOME ($M)	5	4	5	9	13
Type 11A Ratio	1.00	0.89	1.10	1.99	2.99
EMPL. (No.)	40	38	59	97	137
Type 11A Ratio	1.00	0.95	1.49	2.44	3.44

Note: Totals may have minor discrepancies due to rounding.

In estimating the 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 per cent of the construction workforce would be sourced from the region, with the remainder residing outside the region and commuting.

Based on the above, it is assumed for this analysis that approximately 70 per cent 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. All of the workforce are assumed to come from NSW and all of consumption induced impacts are included in Table 4.3.

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

- $23M in annual direct and indirect output;
- $8M in annual direct and indirect value added;
- $5M in annual direct and indirect household income; and
- 56 direct and indirect jobs.

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

- $49M in annual direct and indirect output;
- $21M in annual direct and indirect value added;
- $13M in annual direct and indirect household income; and
- 137 direct and indirect jobs.

The above level of impacts on the regional and NSW economy would be felt for the first year of construction, with two thirds this level of impact occurring in the second year of construction (as construction only occurs for eight months of the second year).

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 phase of the Project range from 1.33 for income up to 1.55 for output. The NSW type 11A ratio multipliers for the construction phase range from 2.99 for income up to 3.60 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:

- *Professional, Scientific and Technical Services;*
- *Wholesale and Retail Trade;*
- *Road Transport;*
- *Non-Residential Property Operators and Real Estate Services;*
- *Structural Metal Product Manufacturing;*
- *Employment, Travel Agency and Other Administrative Services; and*
- *Building Cleaning, Pest Control and Other Support Services.*

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 would 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; and*
- *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.

4.2 Agricultural impacts

Construction of the Project would impact up to 20 ha of agricultural land that is currently used for sheep grazing. Based on average sheep grazing gross margin budgets (NSW DPI, 2024) 20 ha of impacted sheep grazing would result in approximately $19,000 per annum of foregone revenue.

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 construction impacts would occur in the first year of construction with half this level of impact occurring in the second year of construction.

Table 4.5 Annual Regional Economic Impacts of Foregone Agriculture During Project Construction ($2024)

	Direct	Production induced	Consumption induced	Total Flow on	TOTAL EFFECT
OUTPUT ($M)	0.02	0.01	0.00	0.01	0.03
Type 11A Ratio	1.00	0.36	0.15	0.51	1.51
VALUE ADDED ($M)	0.01	0.00	0.00	0.00	0.01
Type 11A Ratio	1.00	0.35	0.19	0.54	1.54
INCOME ($M)	0.00	0.00	0.00	0.00	0.00
Type 11A Ratio	1.00	0.61	0.33	0.94	1.94
EMPL. (No.)	0.04	0.02	0.01	0.03	0.07
Type 11A Ratio	1.00	0.56	0.30	0.86	1.86

Table 4.6 Annual NSW Economic Impacts of Foregone Agriculture During Project Construction ($2024)

	Direct	Production induced	Consumption induced	Total Flow on	TOTAL EFFECT
OUTPUT ($M)	0.02	0.01	0.01	0.03	0.05
Type 11A Ratio	1.00	0.75	0.69	1.44	2.44
VALUE ADDED ($M)	0.01	0.01	0.01	0.01	0.02
Type 11A Ratio	1.00	0.75	0.80	1.54	2.54
INCOME ($M)	0.00	0.00	0.00	0.01	0.01
Type 11A Ratio	1.00	1.47	1.44	2.91	3.91
EMPL. (No.)	0.04	0.04	0.04	0.08	0.12
Type 11A Ratio	1.00	1.05	1.14	2.20	3.20

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

- $0.03M in annual direct and indirect regional output;
- $0.01M in annual direct and indirect regional value-added;
- $0.004M in annual direct and indirect household income; and
- 0.07 direct and indirect jobs.

The above level of impacts on the regional and NSW economy would be felt for the first year of construction, with half this level of impact occurring in the second year of construction (as construction only occurs for six months of the second year).

This represents less than 0.06 per cent 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.

4.3 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 (drive-in drive-out (DIDO)/fly-in fly-out (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. The impact can be increases in housing prices and rents, and shortages of short-term accommodation that might otherwise be used for tourism or other purposes. The extent of housing price impacts for regional economies would depend on the level of in migration of labour seeking local accommodation, 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 IMPACTS

5.1 The Project

For the analysis of the operational phase of the Project, a new Project operation sector was inserted into regional and NSW IO tables 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 uplift of electricity price (net of transmission costs) from operation of the BESS (e.g. frequency control ancillary services, energy arbitrage etc). The proponent advised of an operational employment of 4 (all of which are assumed to reside in the region). Wages for this level of employment were based on IBISworld (2023). 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. The indirect impacts of this sector were estimated using the *EconImp* program.

5.1.1 Impacts

On this basis the total and disaggregated average annual impacts of the Project on the regional and NSW economy (in 2024 dollars) is shown in Tables 5.1 and 5.2.

Table 5.1 – Annual Economic Impacts of the Project on the Regional Economy ($2024)

	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	TOTAL EFFECT
OUTPUT ($M)	5	1	1	1	7
Type 11A Ratio	1.00	0.14	0.14	0.28	1.28
VALUE ADDED ($M)	2	0	0	1	2
Type 11A Ratio	1.00	0.23	0.27	0.50	1.50
INCOME ($M)	0.7	0.2	0.2	0.4	1.1
Type 11A Ratio	1.00	0.35	0.28	0.63	1.63
EMPL. (No.)	4	3	3	6	10
Type 11A Ratio	1.00	0.75	0.74	1.49	2.49

Table 5.2 – Annual Economic Impacts of the Project on the NSW Economy ($2024)

	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	TOTAL EFFECT
OUTPUT ($M)	5	2	3	5	10
Type 11A Ratio	1.00	0.46	0.56	1.01	2.01
VALUE ADDED ($M)	2	1	2	3	4
Type 11A Ratio	1.00	0.71	1.01	1.73	2.73
INCOME ($M)	0.7	0.8	0.8	1.6	2.3
Type 11A Ratio	1.00	1.09	1.22	2.31	3.31
EMPL. (No.)	4	7	10	17	21
Type 11A Ratio	1.00	1.73	2.52	4.25	5.25

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

- $7M in annual direct and indirect regional output;
- $2M in annual direct and indirect regional value-added; and
- $1M 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:

- $10M in annual direct and indirect regional output;
- $4M in annual direct and indirect regional value-added;
- $2M in annual direct and indirect household income; and
- 21 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.

5.1.2 Multipliers

The Type 11A ratio multipliers for the Project's impact on the regional economy range from 1.28 for output up to 2.49 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 2.01 for output up to 5.25 for income. 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.

5.1.3 Main Sectors Affected

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

- *Wholesale Trade;*
- *Building Cleaning, Pest Control and Other Support Services;*
- *Professional, Scientific and Technical Services;*
- *Road Transport;*
- *Electricity Transmission, Distribution, On Selling and Electricity Market Operation;*
- *Retail Trade;*
- *Insurance and Superannuation Funds;*
- *Construction Services;*
- *Non Residential Property Operators and Real Estate Services; and*
- *Employment, Travel Agency and Other Administrative Services.*

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

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

- *Retail and Wholesale Trade;*
- *Food and Beverage Services;*
- *Health Care Services;*
- *Actual Rent for Housing;*
- *Professional, Scientific and Technical Services;*

- *Primary and Secondary Education;*
- *Residential Care and Social Assistance; and*
- *Personal Services.*

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

5.2 Agricultural impacts

Conservatively, operation of the Project is assumed to impact up to 20 ha of agricultural land that is currently used for sheep grazing. However, this impact could be reduced depending on how Project Area land not required for the BESS and associated infrastructure is utilised. Based on average sheep grazing gross margin budgets (NSW DPI, 2024) 20 ha of impacted sheep grazing would result in approximately $19,000 per annum of foregone revenue.

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 ($2024)

	Direct	Production induced	Consumption induced	Total Flow on	TOTAL EFFECT
OUTPUT ($M)	0.02	0.01	0.00	0.01	0.03
Type 11A Ratio	1.00	0.36	0.15	0.51	1.51
VALUE ADDED ($M)	0.01	0.00	0.00	0.00	0.01
Type 11A Ratio	1.00	0.35	0.19	0.54	1.54
INCOME ($M)	0.00	0.00	0.00	0.00	0.00
Type 11A Ratio	1.00	0.61	0.33	0.94	1.94
EMPL. (No.)	0.04	0.02	0.01	0.03	0.07
Type 11A Ratio	1.00	0.56	0.30	0.86	1.86

Table 5.4 Annual NSW Economic Impacts of Foregone Agriculture During Project Operation ($2024)

	Direct	Production induced	Consumption induced	Total Flow on	TOTAL EFFECT
OUTPUT ($M)	0.02	0.01	0.01	0.03	0.05
Type 11A Ratio	1.00	0.75	0.69	1.44	2.44
VALUE ADDED ($M)	0.01	0.01	0.01	0.01	0.02
Type 11A Ratio	1.00	0.75	0.80	1.54	2.54
INCOME ($M)	0.00	0.00	0.00	0.01	0.01
Type 11A Ratio	1.00	1.47	1.44	2.91	3.91
EMPL. (No.)	0.04	0.04	0.04	0.08	0.12
Type 11A Ratio	1.00	1.05	1.14	2.20	3.20

These annual agricultural impacts are minor.

5.3 Other impacts

The operation of the Project would create a very small demand for regional labour resources (4 direct jobs in a labour market of 5,255) and regional inputs to production (that from the IO analysis represent 0.2 per cent 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 BESS using the latest technology (subject to landholder agreements and planning approvals); and
- remove the BESS and associated infrastructure and rehabilitate the site in accordance with consent conditions and as agreed with the landowner.

However, from an economic impact perspective both would provide stimulus to the regional and NSW economy via spending on inputs to replacement 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 would 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

SSD	Project	Distance	Capacity	Status	Construction start
SSI-9172452	Project Energy Connect (NSW East Section)	1 km	-	Prepare EIS	2026
SSI-72887208	Victoria to NSW Interconnector West	1 km	-	Prepare EIS	2026
SSD-74990235	West Nyangay Solar Farm	1 km	800 MW	Prepare EIS	Unknown
SSD-50629707	The Plains Wind Farm	4 km	1,800 MW	Response to Submissions	2027
SSD-77340978	Abercrombie Wind Farm	9 km	870 GW	Prepare EIS	2028
SSD-70636459	Booroorban (Saltbush) Wind Farm	20 km	400 MW	Prepare EIS	2028
SSD-59254709	Pottinger Solar Farm	30 km	300 MW	Prepare EIS	2026
SSD-59235464	Pottinger Wind Farm	30 km	831 MW	Recommendation	2026
SSD-59701722	Tchelery Wind Farm	35 km	577 MW	Prepare EIS	2026
SSD-40138508	Baldon Wind Farm	35 km	1,400 MW	Assessment	2025
SSD-8113	Hay Solar Farm	50 km	110 MW	Approved	Commenced
SSD-50505215	Bullawah Wind Farm	55 km	1,000 MW	Assessment	2025
SSD-51306206	Wilan Wind Farm	61 km	800 MW	Prepare EIS	2025
SSD-38358962	Keri Keri Wind Farm	65 km	884 MW	Response to Submissions	2027
SSD-50725708	Dinawan Wind Farm	70 km	1,200 MW	Response to Submissions	2025
SSD-50725959	Dinawan Solar Farm	70 km	800 MW	Assessment	2025
SSD-41743746	Yanco Delta Wind Farm	85 km	1,500 MW	Approved	2026
SSD-30448824	Junction Rivers Wind Farm	90 km	750 MW	Response to Submissions	2025

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 would be met from:

- the region:
  - the unemployment pool;
  - increased labour force participation; and
  - 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. Fly-in-fly-out (FIFO) and Drive-in-drive-out (DIDO).

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), including in areas experiencing 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 experiencing population decline. There has also been a decline in the population of smaller towns even in regions where the population has been growing.

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 would 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, 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 facilities, and other accommodation options, as well as adjustment of the overall housing supply in response to increased demand. Early provision of additional accommodation by project proponents and the private sector 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 would 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 would 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, would benefit from the cumulative economic activity.

7.2.6 Impacts on Other Sectors of the Economy

Notwithstanding the above, large cumulative 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 medium-term markets would 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. BESSs utilise a very small area of land, the location of wind farm turbines tends to be on low land capability soils while grazing can continue between and under solar panels. The cumulative impact of projects on the regional economic activity of agriculture is therefore likely to be minor.

7.2.8 Mitigation Measures

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

Greater use of FIFO/DIDO and workforce accommodation would reduce impacts on the regional labour market (wage increases and labour shortages) and accommodation market (price/rent increases) but would also reduce regional economic activity benefits, because FIFO/DIDI workers would 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 Council's 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 would work in partnership with the local councils 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;
- 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;
- Establishment of a Community Benefit Fund to be managed through a Voluntary Planning Agreement with Councils 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; and
- Reinstatement of full pre-project agricultural capability following project decommissioning.

The Agricultural Impact Assessment (Appendix J of the EIS) and the Social Impact Assessment (Appendix R of the EIS) provides additional management measures which are relevant to the impacts discussed in this report.

9 CONCLUSION

The Project would 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. These regional economic impacts were assessed using IO analysis.

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

The Proponent proposes to work in partnership with local councils 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 Generation of Regional Input-Output Tables (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; and
- 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		ADJUSTMENTS TO NATIONAL TABLE
	1	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); and
   - 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).

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.

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

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

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

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

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

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