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HumeLink

Economic Impact Assessment
EIS Technical Report 6

HillPDA CONSULTING

HUMELINK

EIS Technical Report 6

Economic Impact Assessment

Prepared for Transgrid

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Report Contacts

Henry Zheng

Consultant

B.LArch(Hons), AdvGradDip.Built environments, Cert R.E Econ&Finance

henry.zheng@hillpda.com

Aneta Ramos

Senior Consultant

Bachelors of Psyc (Hons) and Commerce (Economics), PgCert Behavioural Economics

Aneta.Ramos@hillpda.com

Supervisor

Adrian Hack

Principal, Urban and Retail Economics

M. Land Econ. B.Town Planning (Hons). MPIA

Adrian.Hack@hillpda.com

Quality Control

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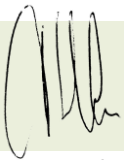
Signature		Dated	26/05/23
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EXECUTIVE SUMMARY

Transgrid proposes to increase the energy network capacity in southern New South Wales (NSW) through the development of new high-voltage transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle. This project is collectively referred to as HumeLink.

The project includes the construction and operation of around 360 kilometres of new electricity transmission lines, substations, permanent and temporary access tracks and roads, and ancillary facilities required during construction.

Construction of the project is targeted to commence in 2024, subject to the required planning and regulatory approvals. Once construction has commenced, the project is estimated to take approximately 2.5 years to construct and become operational by the end of 2026.

Objectives of this report

The main purpose of this report is to identify and assess the potential economic impacts from construction and operation of the project to support the environmental assessment of the project in accordance with Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report is one of several technical reports that form part of the Environmental Impact Statement (EIS) for the project. The NSW Department of Planning and Environment has provided the Planning Secretary's Environmental Assessment Requirements (SEARs) for the EIS. This report has been prepared to address the SEARs which relate to economic impacts. It provides an assessment of potential economic impacts of the project and outlines proposed management measures.

Methodology

The approach for assessing the economic impacts involved the following tasks:

- reviewing legislation and policy context for economic impacts
- defining the study area
- describing the existing economic environment of the study area
- assessing potential positive and negative economic impacts during construction and operation of the project
- describing potential cumulative impacts
- identifying measures to manage impacts relating to construction and operation.

HillPDA used input-output (I-O) modelling, to estimate the economic impacts at the regional, State and national level.

Study area

The study area for this Economic Impact Assessment has been defined to include the local government areas (LGAs) that are most likely to be impacted by the project, including:

- Wagga Wagga City
- Cootamundra-Gundagai Regional
- Goulburn-Mulwaree
- Hilltops
- Snowy Valleys
- Upper Lachlan Shire
- Yass Valley.

It should be noted that the study area for this report extends beyond the five LGAs that the project footprint falls within to include two adjacent LGAs, being Hilltops and Goulburn-Mulwaree. This is because the potential economic benefits and impacts are likely to extend into these additional LGAs given their close proximity to the project (eg increased spend in local businesses associated with the construction workers and increased job opportunities).

Legislation and policy context

The State, regional and local planning policies emphasise the need to improve energy related infrastructure to deliver more reliable and affordable energy as this would help to boost productivity and support economic growth. Supporting renewable energy, along with creating job opportunities and supporting regional economic growth are also common features of these policies.

On top of supporting a significant number of construction jobs, HumeLink would also increase the amount of renewable energy that can be delivered across the national electricity grid and deliver more reliable and affordable energy. As such, HumeLink aligns with the underpinning principles of the State, regional and local planning policies and would create benefits for the NSW economy (particularly regional NSW) and employment opportunities for workers in NSW.

Study area economic drivers

Population growth

The study area accommodated 171,005 residents as at 2021, of which 40 per cent resided in the Wagga Wagga City LGA. The resident population in the study area is projected to grow to 188,414 residents by 2041, which represents an annual growth rate of 0.5 per cent per year. Most of this growth is expected to occur in the Goulburn-Mulwaree LGA.

Employment profile

In the 2022 March quarter, the study area's labour force totalled 84,223 persons and the unemployment rate was at 4.1 per cent, down from 4.4 per cent in the corresponding quarter last year. This is consistent with national trends and is reflective of the tight labour market. However, unemployment remained high and above the regional NSW average (4.3 per cent) in the Hilltops and Goulburn-Mulwaree LGAs. The study area's declining unemployment rate may also in part be due to the labour force population declining over this period and since 2020. As such, a number of people previously unemployed may have drop out of the labour force as discouraged workers.

Gross regional product and output

The study area's gross regional product (GRP) was $9.3 billion.

Output by industry is a gross measure of the total sales of each industry sector in a region (ie the industry revenue). It does not measure how productive each industry sector is at producing this output – which is measured by gross value added (and addressed in Section 5.1.3). The three largest industries in the study area in terms of output are:

- agriculture, forestry and fishing ($2.5 billion and 14 per cent)
- construction ($2.3 billion and 13 per cent).
- manufacturing ($2.3 billion and 13 per cent of total industry output).

The electricity, gas, water and waste industry also accounted for a notable four per cent of the study area's total industry output.

Economic impacts

The economic benefits during construction of the project at regional, State and national level are summarised in Section 6.0 and below.

	$6.3 billion in direct and indirect gross output or business turnover (regional) $8.9 billion in direct and indirect gross output or business turnover (State wide) $9.4 billion in direct and indirect gross output or business turnover (nation-wide)
	$2.8 billion in direct and indirect GVA (regional) $4.0 billion in direct and indirect GVA (State wide) $4.3 billion in direct and indirect gross value added (GVA) (nation-wide)
	17,462 direct and indirect jobs (regional) 25,817 direct and indirect jobs (State wide) 27,294 direct and indirect jobs (nation-wide)
	$1.5 billion in direct and indirect remuneration (regional) $2.1 billion in direct and indirect remuneration (State wide) $2.2 billion in direct and indirect remuneration (nation-wide)

Figure: Economic benefits of the HumeLink project

The project's total contribution to the regional economy would be influenced by the extent to which local businesses can provide the inputs to production (ie labour, capital, materials etc) to support the construction and operation of the project. Transgrid has been and would continue to consult with landowners, community members, local councils and interest groups to identify methods to minimise adverse impacts, where possible, and maximise benefits for the region.

The main economic benefit of the project is the increase in the amount of electricity that can be delivered to customers across the National Electricity Market and would enable NSW businesses and households to have greater access to reliable and affordable electricity (Transgrid, 2022). Increased competition in wholesale energy would help to lower and stabilise electricity price and reduce volatility over the longer term. More reliable and affordable energy in turn is associated with increased business productivity and lower living expenses.

Several major infrastructure projects are scheduled for construction in the study area in the coming years which may impact the availability of short-term rental accommodation. The cumulative impacts with other projects including Snowy 2.0 would increase demand for workers' accommodation during the construction phase. As part of the project Transgrid would build a fully serviced temporary accommodation facility in Tumbarumba to house up to 200 workers to ease the demand on short-term rental accommodation. Transgrid will prepare a Worker Accommodation Strategy prior to the commencement of construction. Councils and other relevant stakeholders will be consulted to identify additional potential options for temporary worker accommodation during construction. The strategy will aim to maximise benefits for the communities within the study area and minimise potential social and economic impacts.

As a worst case scenario, based on the indicative concept design, it is likely that the project would result in approximately 391.2 hectares of forestry land during construction and 351.8 hectares of forestry land during operation being permanently removed from production as a result of the project. This would equate to approximately 0.2 per cent of the total area of forestry land use within the directly impacted LGAs. In terms of any permanent losses in private plantation, owners would be compensated under just terms under the *Land Acquisition (Just Terms Compensation) Act 1991* for any loss of forest. Overall, the economic impact on forestry associated with the project is considered insignificant.

The project is estimated to deliver $1.3 billion in net market benefits to electricity customers (AEMO, 2022), through:

- avoided unserved energy
- avoided fuel costs
- avoided generation/storage costs (excluding fuel costs)
- avoided renewable energy zone (REZ) transmission capex
- avoided voluntary load curtailment
- competition benefits (including wholesale market cost savings and demand response benefits).

Contents

Tables

Figures

Glossary of terms

Term	Definition
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
Aurecon	Aurecon Australasia Pty Ltd (principal EIS consultant for the project)
ANO	Authorised Network Operator
CBA	Cost–benefit analysis
CGE	Computable generated equilibrium
CSSI	Critical State Significant Infrastructure
Economic base	Refers to companies and other employers that generate lots of jobs in a local or regional area
EIA	Economic Impact Assessment
EIS	Environmental Impact Statement
Employment self-containment	Percentage of local residents employed in local jobs
EnergyConnect	An electrical interconnector of around 900 kilometres between the electricity grids of South Australia and New South Wales, with an added connection to north-west Victoria
EP&A Act	(NSW) *Environmental Planning and Assessment Act 1979*
FTE	Full-time equivalent
Gregadoo Solar Farm	This project which proposed to comprise construction, operation and decommissioning of a maximum 47 megawatt solar farm and associated infrastructure
GDP	Gross domestic product
GRP	Gross regional product (GRP) is a measure of size or net wealth generated by the local economy
GVA	Gross value added (GVA) of an industry refers to the value of outputs less the costs of inputs. It also measures the contribution that the industry makes to the economy or gross domestic product (GDP)
Impacted LGAs / the Region	The seven local government areas (LGAs) of Wagga Wagga City, Snowy Valleys, Cootamundra-Gundagai Regional, Hilltops, Goulburn-Mulwaree, Upper Lachlan Shire and Yass Valley which would be most economically impacted by the project
I-O	Input-Output
Jeremiah Wind Farm	This project which proposes to construct, maintain and operate a 65-wind turbine generator wind farm and associated infrastructure

Term	Definition
Job years	A job year is one full-time equivalent job over one year. This is used to measure jobs generated and supported in design and construction. This unit of measure is better than jobs because construction has a short life and hence the jobs are not permanent. Dividing the number of job years by the number of years of construction gives the average number of jobs during construction
kV	Kilovolt
LGA	Local government area
Local industry GRP	Local industry GRP shows the value of the local economy, generated by the local workers within the area regardless of where they live, after taxes and dividends leave the area
Local resident GRP	Local residents GRP refers to the economic output of the residents of the area regardless of where they work (ie reflects the income received by people in the City)
LSPS	Local Strategic Planning Statements
NEM	National Electricity Market
NIEIR	National Institute of Economic and Industry Research
NSW	New South Wales
OPGW	Optical fibre ground wire
Planning Systems SEPP	State Environmental Planning Policy (Planning Systems) 2021
Project footprint	The area that has been assumed for the purpose of this EIS to be directly affected by the construction and operation of the project. It includes the indicative location of project infrastructure, the area that would be directly disturbed during construction and any easement required during operation.
(the) project	The CSSI project "HumeLink", which is described in Section 1.1 of this document. The project involves the construction and operation of high voltage transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle.
(the) proponent	The project is proposed to be undertaken by NSW Electricity Networks Operations Pty Ltd (referred to as Transgrid). Transgrid is the operator and manager of the main high voltage transmission network in NSW and the ACT, and is the Authorised Network Operator (ANO) for the purpose of an electricity transmission or distribution network under the provisions of the *Electricity Network Assets (Authorised Transactions) Act 2015*. Transgrid is also classified as an energy services corporation under the *Energy Services Corporations Act 1995* and a transmission operator under the *Electricity Supply Act 1995*.
RIA	Regional impact analysis
Rye Park Wind Farm	This project proposes to construct a wind farm with the capacity to generate up to 327 megawatts of power with a potential for over a terawatt hour of production each year.
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
Snowy 2.0 – Main Works	This project involves the development of an underground pumped hydro power station and ancillary infrastructure linking the existing Tantangara and Talbingo Reservoirs.
Snowy 2.0 – Transmission Connection Project	This project involves the construction and operation of an overhead transmission line connection and substation to connect Snowy 2.0 to the NEM.

Term	Definition
SSI	State Significant Infrastructure
transmission line route	The location of the transmission line structures along the middle of the transmission line easement
TSRs	Travelling stock reserves
Unserved energy	A measure of the amount of customer demand that cannot be supplied within a region due to a shortage of generation, demand-side participation or interconnector capacity (AEMO,2019)
VNI West	The Victoria to NSW Interconnector West project, which involves the development of a new 500 kV targeted interconnector between Victoria and NSW to address transmission network limitations, and improve supply reliability.
Voluntary load curtailment	The voluntary specific removal or reduction of electrical loads for a limited period of time from a utility grid system in response to a request from the utility or electrical grid system operator
Yass Solar Farm	This is an 80 megawatt solar and 20 megawatt storage project proposed on land directly adjacent to the Transgrid Yass substation and on land to the south-west of the township of Yass.

1.0 INTRODUCTION

1.1 Overview

The Australian energy landscape is transitioning to a greater mix of low-emission renewable energy sources, such as wind and solar. To support this transition, meet our future energy demands and connect Australian communities and businesses to these lower cost energy sources, the national electricity grid needs to evolve.

Transgrid proposes to increase the energy network capacity in southern New South Wales (NSW) through the development of around 360 kilometres of new 500 kilovolt (kV) high-voltage transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle. This project is collectively referred to as HumeLink. The project would be located across five Local Government Areas (LGAs) including Wagga Wagga City, Snowy Valleys, Cootamundra-Gundagai Regional, Upper Lachlan Shire and Yass Valley. The location of the project is shown on Figure 1.1.

HumeLink would involve construction of a new substation east of Wagga Wagga as well as connection to existing substations at Wagga Wagga and Bannaby and a future substation at Maragle in the Snowy Mountains (referred to as the future Maragle 500 kV substation). The future Maragle 500 kV substation is subject to a separate major project assessment and approval (reference SSI-9717, EPBC 2018/836).

The project would deliver a cheaper, more reliable and more sustainable grid by increasing the amount of renewable energy that can be delivered across the national electricity grid, helping to transition Australia to a low carbon future. It would achieve this by supporting the transfer of energy from existing renewable generation as well as facilitate development of new renewable generation in the Wagga Wagga and Tumut Renewable Energy Zones (REZs). The project would provide the required support for the network in southern NSW, allowing for the increase in transfer capacity between new renewable generation sources and the state's demand centres of Sydney, Newcastle and Wollongong. The project would also improve the efficiency and reliability of the current energy transfer in this part of the network.

Furthermore, HumeLink would form a key part of the transmission line infrastructure that supports the transfer of energy within the National Electricity Market (NEM) by connecting with other major interconnectors. The NEM incorporates around 40,000 kilometres of transmission lines across Queensland (QLD), NSW, Australian Capital Territory (ACT), Victoria (VIC), South Australia (SA) and Tasmania (TAS).

Construction of the project is targeted to commence in 2024, subject to the required planning and regulatory approvals. Once construction has commenced, the project is estimated to take approximately 2.5 years to build and would become operational by the end of 2026.

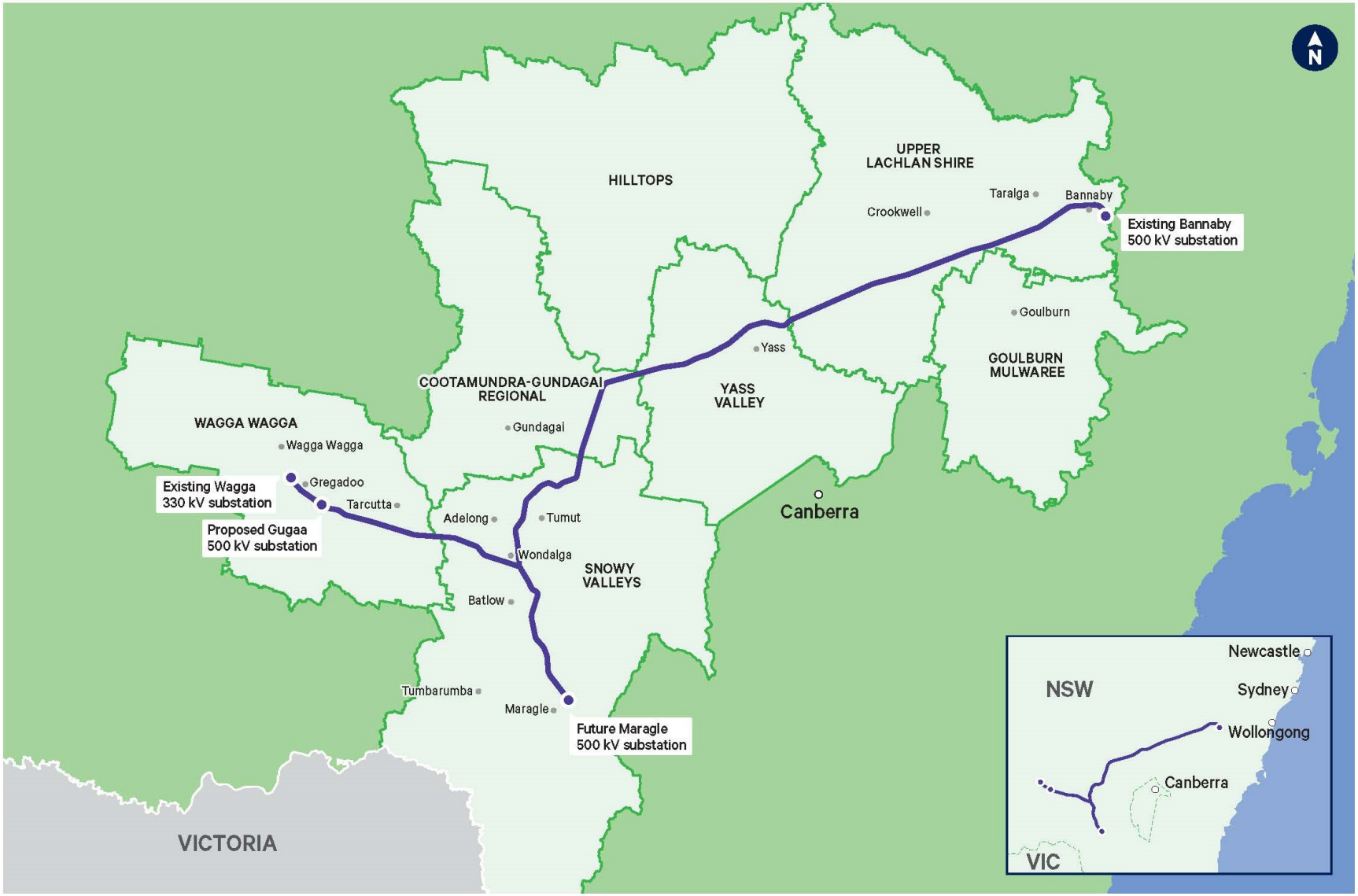
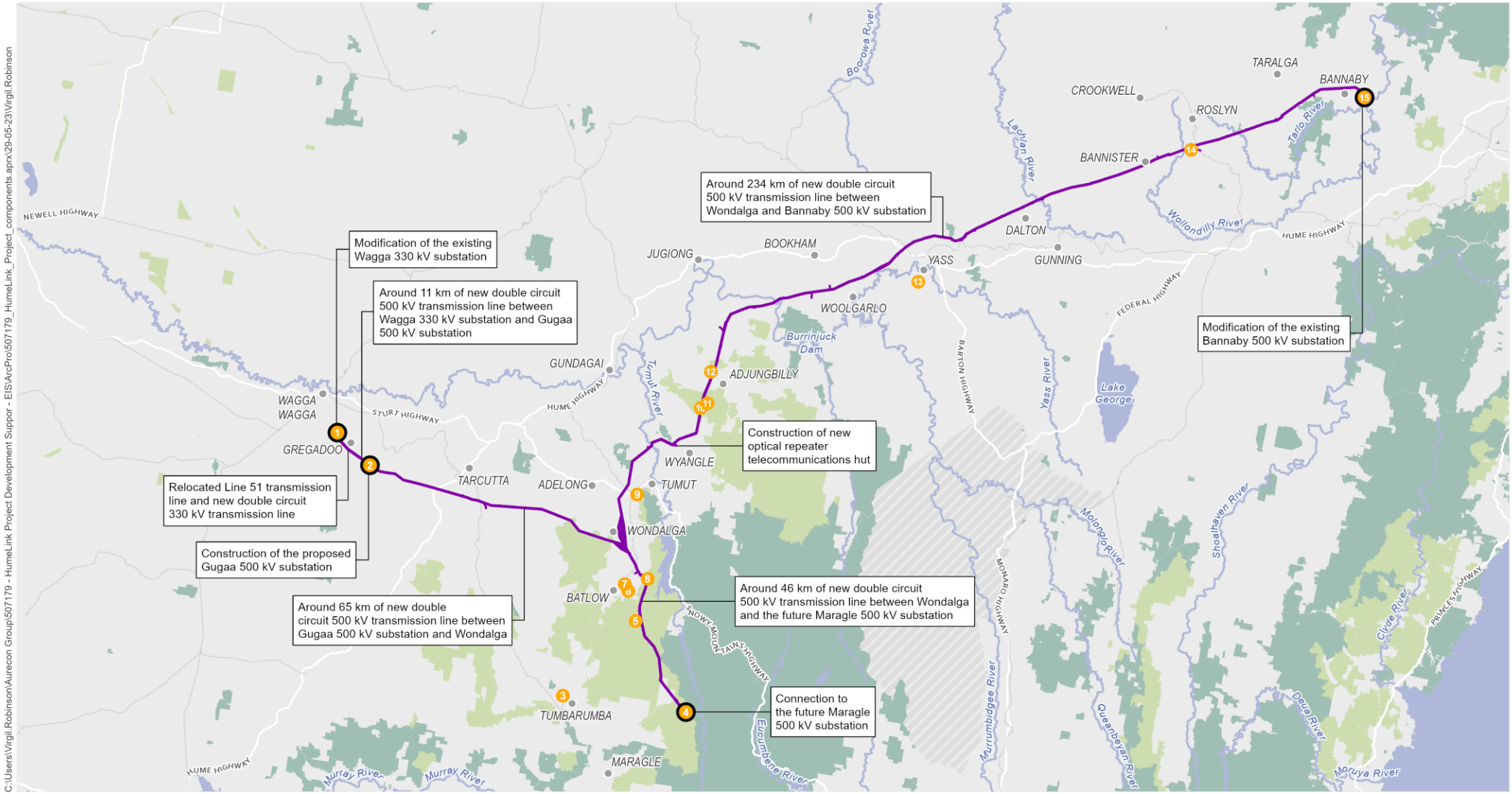


Figure 1.1: Location of the project

1.2 Key components

The project includes the following key components (refer to Figure 1-2):

- construction and operation of around 360 kilometres of new double circuit 500 kV transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle
- construction of a new 500/330 kV substation at Gregadoo (Gugaa 500 kV substation) approximately 11 kilometres south-east of the existing Wagga 330/132 kV substation (Wagga 330 kV substation)
- demolition and rebuild of a section of Line 51 (around two kilometres in length) as a double circuit 330 kV transmission line connecting into the Wagga 330 kV substation
- modification of the existing Wagga 330 kV substation and Bannaby 500/330 kV substation (Bannaby 500 kV substation) to accommodate the new transmission line connections
- connection of transmission lines to the future Maragle 500/330 kV substation (Maragle 500 kV substation, approved under the Snowy 2.0 Transmission Connection Project (SSI-9717))
- provision of one optical repeater telecommunications hut and associated connections to existing local electrical infrastructure
- establishment of new and/or upgraded temporary and permanent access tracks
- ancillary works required for construction of the project such as construction compound, worker accommodation facilities, utility connections and/or relocations, brake and winch sites, and helipad/helicopter support facilities.



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:925,000

0 20 40km

Projection: GDA 1994 MGA Zone 55

HumeLink **Economic Impact Assessment**

FIGURE 1-2: Key components of the project

1.3 Purpose and scope of this report

The main purpose of this report is to identify and assess the potential economic impacts from construction and operation of the project to support the environmental assessment of the project in accordance with Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report has the following objectives to:

- identify the economic impacts attributable to developing the project
- assess and quantify, where possible, all the potential economic costs and benefits during construction and operation of the project
- estimate the changes to economic activity associated with developing the project compared to a 'no action' alternative (ie the base case)
- estimate the project's contribution to the economy at regional, State and national level
- evaluate the economic impacts of the project on local businesses.

1.4 Secretary's environmental assessment requirements

This report is one of several technical reports that form part of the Environmental Impact Statement (EIS) for the project. The NSW Department of Planning and Environment has provided the Planning Secretary's Environmental Assessment Requirements (SEARs) for the EIS. This report has been prepared to address the SEARs which relate to economic impacts. It provides an assessment of potential economic impacts of the project and outlines proposed management measures.

Table 1-1 outlines the SEARs relevant to this report along with a reference to where these are addressed.

Table 1-1: SEARs for economic impacts

Reference	Requirement	Where addressed in this document
Economic	An assessment of the benefits of the project for the region and the State as a whole, including consideration of any increase in demand for community infrastructure and services, and details of how the construction workers would be managed to minimise local impacts, including a consideration of the construction workers accommodation and an assessment of the impacts to State Forests.	■ Refer to Sections 6.3, 6.4, 6.4.1, 6.5 and 6.6 for potential benefits of the project for the region and the State as a whole. ■ Refer to Sections 2.2 and 8.7 for details of how the construction workers would be managed to minimise local impacts, including a consideration of the construction worker accommodation in Tumbarumba for 200 workers. ■ Refer to Section 7.3 for potential impacts to State forests.

1.5 Structure of this report

The structure and content of this report is as follows:

- Chapter 1 – Introduction: outlines the background and need for the project, and the purpose of this report
- Chapter 2 – Project description summary: summarises the key components of the project and provides a description of the construction and operation of the project
- Chapter 3 – Legislation and policy context: provides an outline of the key legislative requirements and policy guidelines relating to the project
- Chapter 4 – Methodology: provides an outline of the methodology used for the preparation of this report
- Chapter 5 – Existing environment: reviews the study area's current economic conditions, including an outline of the major economic parameters
- Chapter 6 – Construction impacts: describes the potential construction impacts associated with the project
- Chapter 7 – Operational impacts: describes the potential operational impacts associated with the project
- Chapter 8 – Cumulative impacts: outlines the potential cumulative impacts with respect to other known developments within the vicinity of the project
- Chapter 9 – Management of impacts: outlines the proposed mitigation measures for the project
- Chapter 10 – Conclusion: provides a conclusion on the potential economic impacts of the project
- Chapter 11 – References: identifies the reports and documents used to generate this report.

1.6 Key project terms

1.6.1 Project footprint

The project footprint has been assumed for the purpose of this EIS to be directly affected by the construction and operation of the project. It includes the indicative location of project infrastructure, the area that would be directly disturbed during construction and any easement required during operation.

1.6.2 Study area

The study area has been defined to include the local government areas (LGAs) that are most likely to be impacted, and include the following:

- Wagga Wagga City
- Cootamundra-Gundagai Regional
- Goulburn-Mulwaree
- Hilltops
- Snowy Valleys
- Upper Lachlan Shire
- Yass Valley.

Refer to Figure 1.1 above.

2.0 PROJECT DESCRIPTION

The project description in this chapter is based on a concept design and indicative construction methodology for the project. The design and construction methodology would continue to be refined and confirmed during detailed design and construction planning by the construction contractors. Further details on the project are provided in Chapters 3 and 4 of the EIS.

2.1 Summary of key components of the project

Key components of the project are summarised in Table 2-1 below.

Table 2-1: Summary of key components of the project

Component	Description
Transmission lines and supporting infrastructure	
Transmission lines and structures	The project includes the construction of new 500 kV transmission line sections between: ■ Wagga 330 kV substation and Gugaa 500 kV substation (approximately 11 km) ■ Gugaa 500 kV substation and Wondalga (approximately 65 km) ■ Wondalga and Maragle 500 kV substation (approximately 46 km) ■ Wondalga and Bannaby 500 kV substation (approximately 234 km). The transmission line section between the Wagga 330 kV substation and proposed Gugaa 500 kV substation would operate at 330 kV under HumeLink. The project also includes the rebuild of approximately 2 km of Line 51 as a new 330 kV transmission line between the Wagga 330 kV substation and around Ivydale Road, Gregadoo. This would be adjacent to the new transmission line between the existing Wagga 330 kV and proposed Gugaa 500 kV substations. The 500 kV transmission lines would be supported on a series of free-standing steel lattice structures that would range between around 50 m up to a maximum of 76 m in height and generally spaced between 300 to 600 m apart. The typical transmission line structure height would be around 60 m. Earth wire and communications cables would be co-located on the transmission line structures. The 330 kV structures for the rebuild of Line 51 would range between 24 m and 50 m in height and have a typical height of 40 m. Indicative configurations of transmission line structures that may be used as part of the project are shown in Figure 2.1. The type and arrangement of the structures would be refined during detailed design. The footings of each structure would require an area of up to 300 m^2 to 450 m^2, depending on ground conditions and the proposed structure type. Additional disturbance at each structure site may be required to facilitate structure assembly and stringing.

Component	Description
Transmission line easements	The easements for the 500 kV transmission lines are typically 70 m wide. However, a number of locations may require wider easements of up to 110 m wide at transposition locations[1] and up to 130 m wide where the new transmission line would parallel the relocated section of Line 51. The easement provides a right of access to construct, maintain and operate the transmission line and other operational assets. The easement also generally identifies the zone of initial vegetation clearance and ongoing vegetation management to ensure safe electrical clearances during the operation of the lines. Vegetation management beyond the easement may also occur where nearby trees have the potential to fall and breach safety clearances.
Telecommunications huts	Telecommunications huts, which contain optical repeaters, would be required to boost the signal in the optical fibre ground wire (OPGW). One telecommunications hut would be required for the project. The telecommunications hut would be located adjacent to existing transmission line structures. Cables would be installed between the transmission line structure and the local power supply. The telecommunications hut would be surrounded by a security fence. A new easement would be established for the telecommunications hut power connection. The project also involves a telecommunications connection of OPGW between two proposed transmission line structures and the future Rye Park Wind Farm substation (SSD-6693). This removes the need for an additional telecommunications hut in this area of the project.
Substation activities	
Construction of the proposed Gugaa 500 kV substation	A new 500/330 kV substation would be constructed at Gregadoo, about 11 km south-east of the Wagga 330 kV substation. The substation would include seven new 500/330 kV transformers and three 500 kV reactors. The proposed Gugaa 500 kV substation is expected to occupy an area of approximately 22 hectares.
Modification of the existing Bannaby 500 kV substation	The existing Bannaby 500 kV substation on Hanworth Road, Bannaby would be expanded to accommodate connections for new 500 kV transmission line circuits. The modification would include changes to the busbars, line bays, bench and associated earthworks, steelwork, drainage, external fence, internal/external substation roads, secondary containment dams, sediment containment dams, cabling, and secondary systems. All of the work would be restricted to the existing substation property.
Modification of the existing Wagga 330 kV substation	The existing Wagga 330 kV substation on Ashfords Road, Gregadoo would be reconfigured to accommodate new bays for two new 500 kV transmission line circuits within the existing substation property. This would include modifications to the busbars, line bays, existing line connections, bench and associated earthworks, relocation of existing high voltage equipment, drainage, external fence, internal substation roads, steelwork, cabling, and secondary systems.
Connection to the future Maragle 500 kV substation	The project would connect to the future Maragle 500 kV substation approved under the Snowy 2.0 Transmission Connection Project (SS1-9717). Construction of the Maragle substation is proposed to be undertaken between 2023 and 2026. Further detail on the Snowy 2.0 Transmission Connection project is available at the Department of Planning and Environment's Major Projects website: www.planningportal.nsw.gov.au/major-projects/project/10591.

1 Transposition is the periodic swapping of positions of the conductors of a transmission line in order to improve transmission reliability.

Component	Description
Ancillary facilities	
Access tracks	Access to the transmission line structures and the substations would be required during construction and operation. Wherever possible, existing roads, tracks and other existing disturbed areas would be used to minimise vegetation clearing or disturbance. Upgrades to existing access tracks may be required. In areas where there are no existing roads or tracks, suitable access would be constructed. This may include waterway crossings.
Construction compounds	Construction compounds would be required during construction to support staging and equipment laydown, concrete batching, temporary storage of materials, plant and equipment and worker parking required to construct the various elements of the project. Fourteen potential construction compound locations have been identified. The proposed use of the construction compounds and their proposed boundaries/layout would be refined as the project design develops in consultation with relevant stakeholders and the construction contractors.
Worker accommodation facility	Existing accommodation facilities within towns adjacent to the project would provide temporary accommodation for the majority of the construction workers. However, a potential shortage in accommodation has been identified close to the project footprint. A potential option to provide additional temporary worker accommodation during the construction period is the establishment of a temporary worker accommodation facility at the corner of Courabyra Road and Alfred Street, Tumbarumba to accommodate about 200 construction workers. The worker accommodation facility would consist of demountable cabins and would be connected to existing utilities. All required amenities for the accommodation facility would be provided including services and worker parking for light and heavy vehicles. However, the ultimate delivery of the project may include multiple temporary worker accommodation facilities in various forms, which would be outlined in the Worker Accommodation Strategy for the project. The strategy will be developed in consultation with councils, and other relevant stakeholders. Any new or changed worker accommodation facility would be subject to additional environmental assessment, as required.
Helipad/helicopter facilities	To facilitate construction of the project, helicopters may be used to deliver materials/equipment and transfer personnel to construction areas particularly within high alpine regions. To enable helicopters to operate safely and allow easy access to the site, a helicopter landing pad would be required. The helipad is expected to occupy an area of around 30 m by 30 m, and would be remediated after construction. These areas would typically be located on existing disturbed land not subject to inundation and a reasonable distance from waterways, sensitive receivers and drainage lines. Eight locations have been identified and assessed as potential helipad locations. The exact locations to be used would be confirmed during detailed design by the construction contractors. In addition to this, the existing facilities at the Wagga Wagga Airport and Tumut Airport may be used.
Utility connections, adjustments and protection	The project would require utility connections, adjustments and protection. Such works include interfaces with other transmission lines and connections to existing services for temporary facilities . Potential impacts to existing services and utilities would be confirmed during detailed design and any proposed relocation and/or protection works would be determined in consultation with the relevant asset owners.

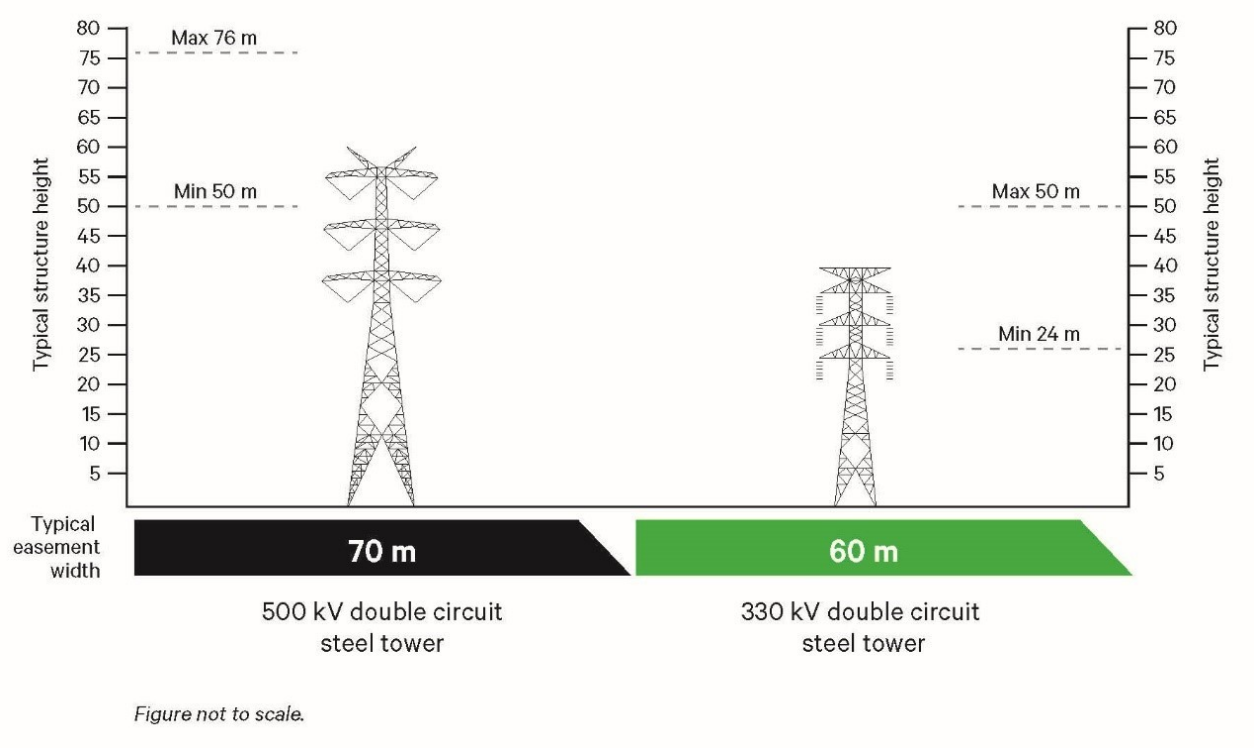


Figure 2.1 Indicative transmission line structures

2.2 Construction of the project

2.2.1 Construction activities

Key construction activities would generally include (but are not limited to):

- site establishment work, such as:
  - clearing of vegetation and topsoil
  - establishment of construction compounds and helipad/helicopter facilities
  - utility relocations and/or adjustments
  - construction of new access tracks and waterway crossings and/or upgrade of existing access tracks to transmission line structures
  - road improvement work
  - establishment of environmental management measures and security fencing
  - construction of temporary worker accommodation
- construction of the transmission lines, including:
  - earthworks and establishment of construction pads and brake and winch sites for each transmission line structure
  - construction of footings and foundation works for the new transmission line structures including boring and/or excavation, steel fabrication works and concrete pours
  - erection of the new transmission line structures
  - stringing of conductors, overhead earth wires and OPGW
  - installation of associated transmission line structure fittings inclusive of all earthing below ground level

- relocation of a section of Line 51, including:
  - demolition of the existing section of Line 51
  - erection of new transmission line structures for the rebuild of Line 51 in a new location
  - stringing of conductors, overhead earth wires and OPGW
  - installation of associated transmission line structure fittings inclusive of all earthing below ground level
- construction of the proposed Gugaa 500 kV substation, including:
  - bulk earthworks to form the substation bench, access roads, drainage and oil containment structures
  - installation of concrete foundations, bund walls, fire walls, noise walls and kerbs including excavation
  - installation of reinforced concrete and piled foundations for the electrical equipment and associated steel support structures
  - installation of electrical conduits, electrical trenches, site stormwater drainage, oil containment work and associated concrete pits, pipes and tanks including excavation
  - installation of new ancillary and equipment control buildings
  - erection of galvanised steel structures to support electrical equipment
  - installation of electrical equipment on foundations and/or steel support structures
  - installation of conductors, cabling, wiring, electrical panels and electrical equipment
  - erection of the substation site boundary security fencing, including site access gates
  - connection of the proposed transmission lines to the substation
- modification of the existing Wagga 330 kV substation to enable the proposed connection and operation of the new transmission lines, including:
  - demolition and removal of redundant electrical equipment, fencing and cabling
  - bulk earthworks to form the extended substation bench and modified drainage structures
  - installation of concrete foundations and kerbs including excavation
  - installation of reinforced concrete and piled foundations for the electrical equipment and associated steel support structures
  - erection of galvanised steel structures to support electrical equipment
  - installation of electrical equipment on foundations and/or steel support structures
  - installation of electrical conduits, electrical trenches, and modified site stormwater drainage including excavation
  - installation of conductors, cabling, wiring, electrical panels and electrical equipment
  - installation of fencing, lighting and other security features
  - testing and commissioning
  - connection of the proposed transmission lines to the substation

- modification of the existing Bannaby 500 kV substation to enable the proposed connection and operation of the new transmission lines, including:
  - bulk earthworks to form the extended substation bench, new access road, modified stormwater drainage, modified oil containment and modified sediment control structures
  - installation of concrete foundations, retaining walls, bund walls, fire walls and kerbs including excavation
  - installation of reinforced concrete and piled foundations for the electrical equipment and associated steel support structures
  - erection of galvanised steel structures to support electrical equipment
  - installation of electrical equipment on foundations and/or steel support structures
  - installation of electrical conduits, electrical trenches, site stormwater drainage, oil containment works and associated concrete pits, pipes and tanks including excavation
  - installation of conductors, cabling, wiring, electrical panels and electrical equipment
  - installation of fencing, lighting and other security features
  - demolish redundant fencing including footings and kerbs
  - testing and commissioning
  - connection of the proposed transmission lines to the substation.
- connection of the proposed transmission lines to the future Maragle 500 kV substation including:
  - stringing conductors between transmission line structures and the future Maragle 500 kV substation gantry (including overhead earth wire (OHEW) and OPGW)
  - installing droppers from the future substation gantry to the switchgear
- construction of the telecommunications hut, including:
  - bulk earthworks to form the pad for the hut
  - excavation and preparation for concrete foundations
  - installation of reinforced concrete and piled foundations
  - excavation and installation of electrical equipment conduits, trenches and general site drainage work
  - installation of the building, site wiring and electrical equipment
  - installation of security fencing and site access gates
- installation of buried cabling from the 500 kV transmission line structures to Rye Park Wind Farm substation
- testing and commissioning of new electrical infrastructure
- demobilisation and rehabilitation of areas disturbed by construction activities.

A number of activities are expected to commence in accordance with the project conditions of approval before the key construction activities outlined above. These activities are considered pre-construction minor work and would comprise low impact activities that would begin after planning approval but prior to approval of the Construction Environmental Management Plan.

2.2.2 Construction program

Construction of the project is targeted to commence in 2024, and is estimated to take about 2.5 years to complete. The project is expected to be fully operational by the end of 2026 (refer to Figure 2.2).

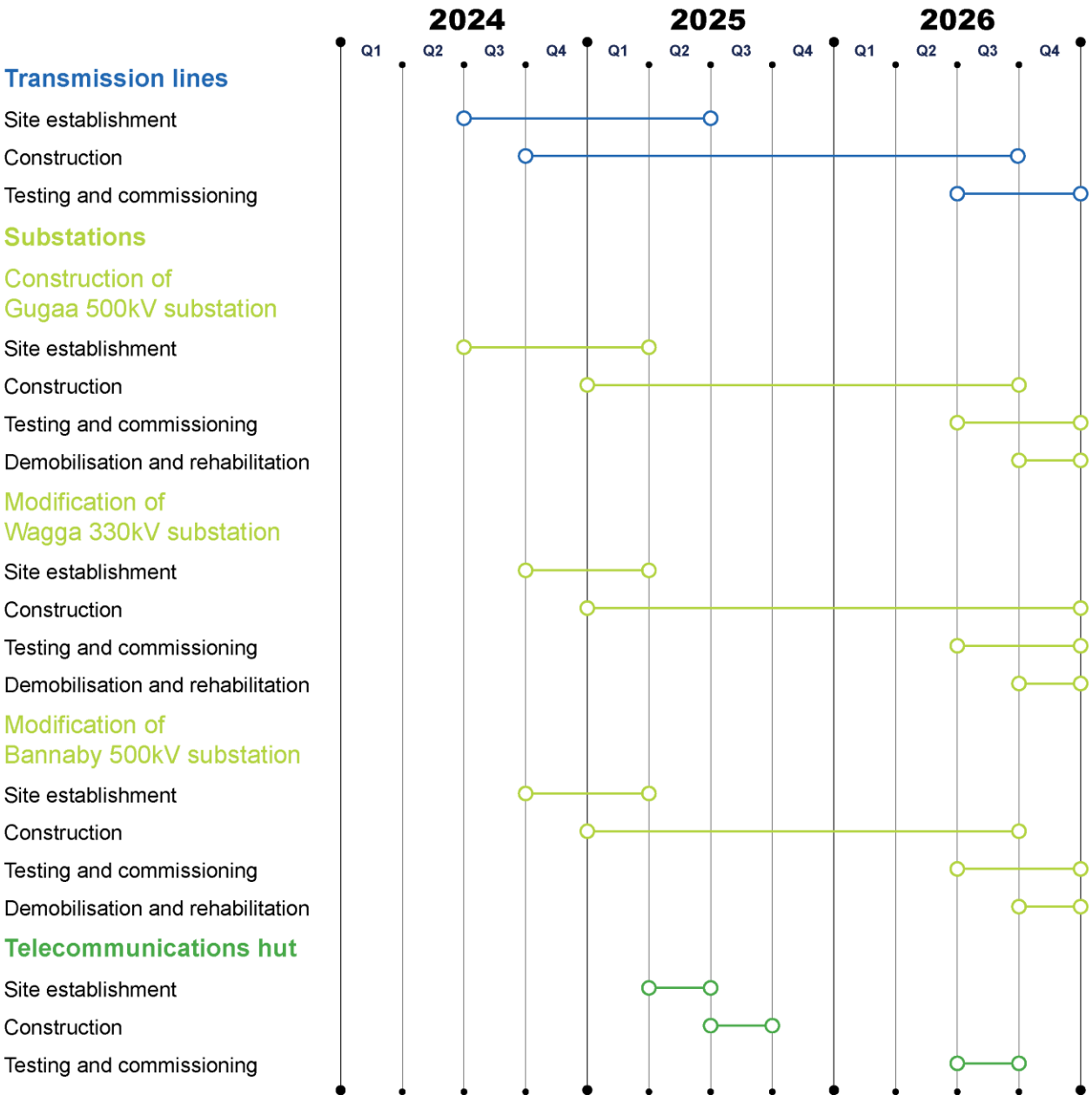


Figure 2.2: HumeLink indicative construction program

Indicative duration of construction activities

Construction at each transmission line structure would be intermittent and construction activities would not occur for the full duration at any one location. Durations of any particular construction activity, and inactive/respite periods, may vary for a number of reasons including (but not limited to):

- multiple work fronts
- resource and engineering constraints
- works sequencing and location.

Figure 2.3 immediately below presents an indicative duration of construction activities associated with an individual transmission line structure.

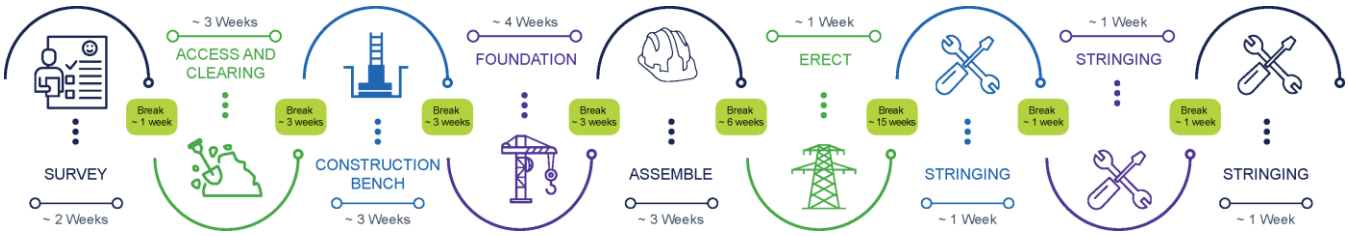


Figure 2.3: Indicative duration and sequence of construction activities for transmission line structures

Construction of the proposed Gugaa 500 kV substation could take up to 2.5 years.

2.2.3 Construction hours

It is expected that construction activities would largely be undertaken during standard construction hours. However, there would be times when working outside of standard construction hours would be required (as defined by the *Interim Construction Noise Guideline* (DECC, 2009)), subject to approval. As the details of construction methodology and project needs are developed, these hours will be refined for certain activities.

Where extended hours are proposed for activities in proximity to sensitive receivers, additional measures would be implemented and the work would be managed through an out-of-hours work protocol.

A series of work outside the standard construction hours is anticipated to include (but is not limited to) the following:

- transmission line construction at crossings of a main road or railway as these locations are expected to have restricted construction hours requiring some night work for activities such as conductor stringing over the crossing(s)
- work where a road occupancy licence (or similar) is required, depending on licence conditions
- transmission line cutover and commissioning
- the delivery of equipment or materials outside standard hours requested by police or other authorities for safety reasons (such as the delivery of transformer units)
- limited substation assembly work (eg oil filling of the transformers)
- connection of the new assets to existing assets under outage conditions (eg modification and/or connection work at Bannaby 500 kV substation, Wagga 330 kV substation and Maragle 500 kV substation), which is likely to require longer working hours
- emergency work to avoid the loss of lives and/or property and/or to prevent environmental harm
- work timed to correlate with system planning outages
- situations where agreement is reached with affected sensitive receivers
- activities that do not generate noise in excess of the applicable noise management level at any sensitive receiver.

2.2.4 Construction plant and equipment

An indicative list of construction plant and equipment likely to be required during construction is provided below.

- air compressor
- backhoe
- bobcat
- bulldozers
- concrete agitator
- concrete pump
- cranes (various sizes up to 400 tonnes)
- crawler crane with grab attachments
- drill and blast units and associated support plant/equipment
- drones
- dumper trucks
- elevated working platforms
- excavators (various sizes)
- flatbed hiab trucks
- fuel trucks
- generators
- graders
- helicopters and associated support plant/equipment
- mulchers
- piling rig
- pneumatic jackhammers
- rigid tippers
- rollers (10 to 15 and 12 to 15 tonnes)
- semi-trailers
- tilt tray trucks
- trenchers
- transport trucks
- watercarts
- winches.

2.2.5 Construction traffic

Construction vehicle movements would comprise vehicles transporting equipment, waste, materials and spoil, as well as workers' vehicles. A larger number of heavy vehicles would be required during the main civil construction work associated with the substations. Non-standard or oversized loads would also be required for the substation work (eg for transformer transport) and transportation of transmission line structure materials and conductors.

Hume Highway, Sturt Highway, Snowy Mountains Highway, Batlow Road and Gocup Road are the main national and state roads proposed to provide access to the project footprint. These roads would be supported by regional and local roads throughout the Local Government Areas (LGAs) of Wagga Wagga City, Snowy Valleys, Yass Valley, Cootamundra-Gundagai Regional and Upper Lachlan Shire that connect to the project footprint.

2.2.6 Construction workers

The construction worker numbers would vary depending on the stage of construction and associated activities. During peak construction activities, the project could employ up to 1,200 full-time equivalent construction workers across multiple work fronts. It is expected that the maximum number of construction workers at any one location would not exceed 200.

2.2.7 Testing and commissioning

Prior to energisation of the infrastructure, a series of pre-commissioning activities would be conducted. This would include testing the new transmission lines and substation earthing, primary and secondary equipment.

2.2.8 Demobilisation and rehabilitation

Demobilisation and site rehabilitation would be undertaken progressively throughout the project footprint and would include the following typical activities:

- demobilisation of construction compounds and worker accommodation facility
- removal of materials, waste and redundant structures not required during operation of the project
- removal of temporary fencing and environmental controls.

2.3 Operation of the project

The design life of the project is 50 years, which can be extended to more than 70 years for some assets.

The substations and transmission lines would be inspected by field staff and contractors on a regular basis, with other operational activities occurring in the event of an emergency (as required). The project would require about five workers (in addition to Transgrid's existing workers) during operation for ongoing maintenance activities. Likely maintenance activities would include:

- regular inspection (ground and aerial) and maintenance of electrical equipment
- general building, asset protection zone and access road/track
- vegetation clearing/trimming within the easement
- fire detection system inspection and maintenance
- stormwater drainage systems maintenance.

It is expected that these activities would only require light vehicles and/or small to medium plant (depending on the work required).

3.0 LEGISLATION AND POLICY CONTEXT

This chapter provides a review and analysis of legislation, planning and policy documents at regional and local levels to understand impacts and implications on policy for different levels of governance.

3.1 Legislation

3.1.1 *Environment Planning and Assessment Act 1979* and State Environmental Planning Policy (Planning Systems) 2021

The project is subject to environmental assessment under Part 5 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). Under clause 2.14 of State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP), HumeLink is deemed State Significant Infrastructure (SSI). The project therefore requires approval from the NSW Minister for Planning under Division 5.2 of the EP&A Act. In addition, in March 2018 the Minister declared the project to be Critical State Significant Infrastructure (CSSI) which is now included in Schedule 5 of the Planning Systems SEPP in association with the Snowy 2.0 project.

This report supports the HumeLink SSI application to the Minister for Planning under Part 5, Division 5.15 of the EP&A Act.

3.2 State and regional planning policies

3.2.1 2022 Integrated System Plan

The *2022 Integrated System Plan* (ISP) was published by the Australian Energy Market Operator (AEMO) on 30 June 2022. It is a 'whole of system plan' that sets out an optimal development path (ODP) with committed and anticipated projects underway, actionable projects to commence at the earliest planned time and future ISP projects to augment the National Electricity Market (NEM).

The ISP identifies the project as being a fundamental part of *Australia's Long -term Emissions Reduction Plan* (Australian Government Department of Industry, Science, Energy and Resources, 2021) and classifies the project as an actionable project. It further notes that the delivery of the project and the Victoria – New South Wales Interconnector West (VNI West) as early as possible, with early works as the first stage, would protect consumers against:

- the risk of faster than anticipated coal retirements
- the risk of project delivery delays
- the risk that storage of more than eight hour duration takes longer than expected to materialise.

The ISP states that the identified need for HumeLink has not changed since the 2020 ISP, that is 'to deliver net market benefit by:

- increasing the transfer capacity and stability limits between the Snowy Mountains and major load centres of Sydney, Newcastle and Wollongong
- enabling greater access to lower cost generation to meet demand in these major load centres
- facilitating the development of renewable generation in high quality renewable resource areas in southern New South Wales, which would further lower the overall investment and dispatch costs in meeting New South Wales demand while also ensuring emissions targets are met at the lowest overall cost to consumers.

The above would help accelerate electrification of the region, and by providing electricity customers with the lowest-cost supply, would contribute to economic growth. HumeLink is estimated to contribute roughly

$1.3 billion of the $24.5 billion in net market benefits delivered by the ODP in the most likely scenario and deliver value in all scenarios. The net market benefits of HumeLink would accrue once a fourth NSW coal-fired power station (including Liddell) retires. The optimal timing of HumeLink therefore depends heavily on the timing of projected coal retirement. Without HumeLink, investment in more long-duration storage would be required to maintain power system reliability in NSW (AEMO, 2022) which is considerably more costly.

3.2.2 Other state and regional plans

Other key State and regional planning policies relevant to this project include:

- *NSW Transmission Infrastructure Strategy*
- *State Infrastructure Strategy 2022-2042*
- *NSW Electricity Strategy*
- *Riverina Murray Regional Plan 2036*
- *The South East and Tablelands Regional Plan 2036.*

These planning policies emphasise the need to improve energy related infrastructure to deliver more reliable and affordable energy as this would help boost productivity and support economic growth. Supporting renewable energy, along with creating job opportunities and supporting regional economic growth are also common features of these policies.

On top of supporting a significant number of construction jobs, the project would also increase the amount of renewable energy that can be delivered across the national electricity grid and deliver more reliable and affordable energy. As such, HumeLink aligns with the underpinning principles of the aforementioned policies and would create benefits for the State economy (particularly regional NSW) and employment opportunities for workers in NSW.

3.3 Local planning policies

In terms of local policy, this report considers the project's alignment, from an economic perspective, to the Local Strategic Planning Statements (LSPS) and economic development strategies for the LGAs most likely to be economically impacted by the project. These LGAs include Wagga Wagga City, Cootamundra-Gundagai Regional, Goulburn-Mulwaree, Hilltops, Snowy Valley, Upper Lachlan and Yass Valley LGAs. The LSPS and economic development strategies considered includes:

- Cootamundra-Gundagai Council LSPS (2020)
- Cootamundra-Gundagai Regional Council: Tourism and Economic Development Strategy (2019)
- Envisage 2040: Our Path to a Sustainable Future (2020)
- Goulburn-Mulwaree Council LSPS (2020)
- Hilltops Economic Growth and Land Use Strategy (2019)
- Hilltops LSPS 2020-2040 (2020)
- Local Strategic Planning Statement: Planning for the future: Wagga Wagga 2020 (2021)
- Southern Tablelands Regional Economic Development Strategy 2018–2022 (2018)
- Snowy Valleys Council Regional Economic Development Strategy (REDS) 2018-2022 (2018)
- Upper Lachlan Shire LSPS (2020)
- Yass Valley Council LSPS (2020).

The need to create local employment opportunities and promote economic growth is consistent across the LSPS and economic development strategies for each of the LGAs. The project would create a significant number of job opportunities within the LGAs that form the study area (including Wagga Wagga City, Cootamundra-Gundagai Regional, Goulburn-Mulwaree, Hilltops, Snowy Valley, Upper Lachlan and Yass Valley LGAs) and would contribute to economic activity in these LGAs, stimulating economic growth. As such the project is also consistent with the local policies listed above.

4.0 METHODOLOGY

This chapter provides an outline of the methodology used for the economic impact assessment, including an outline of the key assumptions and limitations relating to the modelling adopted.

4.1 Overview of approach

Due to an absence of a formal economic impact assessment guideline for NSW, the *QLD Economic Impact Assessment Guideline* (State of Queensland, Department of State Development, 2017), detailed in Appendix A, was used to develop this assessment's approach. The methodology is summarised as follows:

- review of legislation and policy context for assessing economic impacts (refer to Chapter 2.0)
- define the study area (refer to Section 4.3)
- describe the existing economic environment of the study area (refer to Chapter 5.0)
- assess the potential positive and negative economic impacts during construction and operation of the project (refer to Chapters 6.0 and 7.0)
- describe the potential cumulative impacts (refer to Chapter 8.0)
- identify measures to manage impacts relating to construction and operation (refer to Chapter 9.0).

Economic metrics examined included: population growth, employment, industry analysis, outputs and gross value added. The analysis utilises the latest available data as sourced from Economy.ID and Australian Bureau of Statistics (ABS) and compare current levels (typically 2020/21 data) against historical levels (typically 2015/16) to distil long-term trends.

4.2 Input-output model

For the purposes of assessing the economic impacts of this project at the regional, State and national levels, HillPDA developed an input-output (I-O) model using the Australian National Accounts 2018-19 I-O tables (ABS, 2021). I-O modelling is a recognised way of evaluating economic impact. The model is used to determine the degree to which a particular industry or activity is integrated into the economy. It captures the direct and indirect effects of expenditure in the economy by accounting for backward linkages and supply chain effects between different industries in the economy, known as the multiplier effect. Moreover, multipliers refer to the level of additional economic activity generated and/or supported by a source industry.

The indirect or multiplier impacts are lower at regional level than they are at the State level and the State level impacts are lower than the impacts at the national level. This is understandable as inputs may be sourced from the local, State or interstate suppliers.

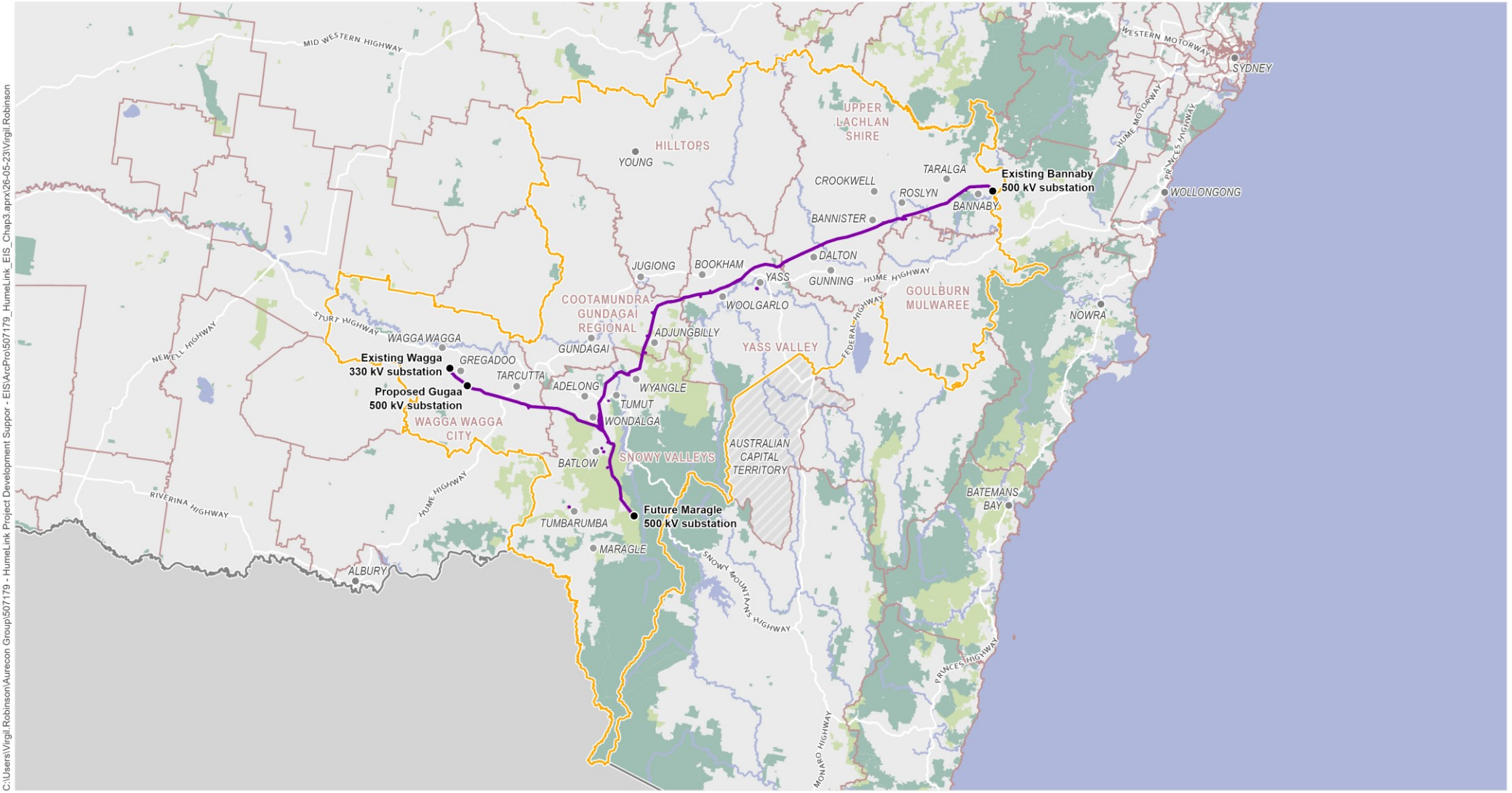
Assessing the level of impacts at the regional and State level was done using location quotient analysis which analyses the range of industries in the region or State and compares it to the national level. An area is considered to have a high level of specialisation in an industry where it has a high level of output and number of workers in that industry compared to the national average. An industry is more likely to source its inputs from its region where the region has a high level of specialisation in source industries. If the region has a very low level of specialisation or underrepresentation, then inputs are likely to be sourced from outside the region. In this case the indirect impacts at the regional level would be lower.

4.3 Study area

The study area has been defined to include the local government areas (LGAs) that are most likely to be impacted, from an economic perspective, by the project. The relevant LGAs include:

- Wagga Wagga City
- Cootamundra-Gundagai Regional
- Goulburn-Mulwaree
- Hilltops
- Snowy Valleys
- Upper Lachlan Shire
- Yass Valley.

The study area is depicted in the map immediately below. It should be noted that the study area for this report extends beyond the five LGAs that are directly impacted by the project footprint to include the adjacent Hilltops and Goulburn-Mulwaree LGAs. This is because the potential economic benefits and impacts are likely to extend into these additional LGAs given their close proximity to the project.



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:1,750,000

0 40 80km

Projection: GDA 1994 MGA Zone 55

HumeLink **Economic Impact Assessment**

FIGURE 4-1: Economic study area

4.4 Key assumptions and limitations

The key assumptions and limitations of the I-O analysis are described in the NSW Government *Guidelines for Economic Appraisal* (NSW Treasury, 2007) as well in the ABS website (ABS, 2020a). The limitations or shortcomings include the following:

- Lack of supply-side constraints: The most significant limitation of economic impact analysis using I-O multipliers is the implicit assumption that the economy has no supply-side constraints, so the supply of each good is perfectly elastic. That is, it is assumed that extra output can be produced in one area without taking resources away from other activities, thus overstating economic impacts. The actual impact is likely to be dependent on the extent to which the economy is operating at or near capacity.
- Fixed prices: Constraints on the availability of inputs, such as skilled labour, require prices to act as a rationing device. In assessments using I-O multipliers, where factors of production are assumed to be limitless, this rationing response is assumed not to occur. The system is in equilibrium at given prices, and prices are assumed to be unaffected by policy and any crowding out effects are not captured. This is not the case in an economic system subject to external influences.
- Fixed ratios for intermediate inputs and production (linear production function): Economic impact analysis using I-O multipliers implicitly assumes that there is a fixed input structure in each industry and fixed ratios for production. That is, the input function is generally assumed linear and homogenous of degree one (which implies constant returns to scale and no substitution between inputs). As such, impact analysis using I-O multipliers can be seen to describe average effects, not marginal effects. For example, increased demand for a product is assumed to imply an equal increase in production for that product. In reality, however, it may be more efficient to increase imports or divert some exports to local consumption rather than increasing local production by the full amount. Further, it is assumed each commodity (or group of commodities) is supplied by a single industry or sector of production. This implies there is only one method used to produce each commodity and that each sector has only one primary output.
- No allowance for economies of scope: The total effect of carrying on several types of production is the sum of the separate effects. This rules out external economies and diseconomies and is known simply as the "additivity assumption". This generally does not reflect real world operations.
- No allowance for purchasers' marginal responses to change: Economic impact analysis using multipliers assumes that households consume goods and services in exact proportions to their initial budget shares. For example, the household budget share of some goods might increase as household income increases. This equally applies to industrial consumption of intermediate inputs and factors of production.
- Absence of budget constraints: Assessments of economic impacts using multipliers that consider consumption induced effects (type two multipliers) implicitly assume that household and government consumption is not subject to budget constraints. Despite these limitations, I-O techniques provide a solid approach for taking account of the inter-relationships between the various sectors of the economy in the short-term and provide useful insight into the quantum of final demand for goods and services, both directly and indirectly, likely to be generated by a project.

In addition to the general limitations of I-O analysis described above, the modelling assumes that the ratio of gross value added and workers' remuneration to gross output in any industry at the regional level is the same as at the national level.

Another important factor is that there is some level of uncertainty with regard to the level of impacts at a regional level and this level of uncertainty increases as the region or study area gets smaller. This is understandable where inputs to production can be sourced from local suppliers but can also be sourced competitively from suppliers in other regions and states. Hence the outputs should be considered as a 'most likely' or reasonable/probable estimate but not necessarily outputs that will be achieved.

5.0 THE REGIONAL ECONOMY

This chapter reviews the study area's current economic performance, including an outline of the major economic indicators. For the purposes of this assessment a high level overview of the study area and composite LGAs is undertaken.

5.1 Study area economic drivers

5.1.1 Population growth

As sourced from the ABS Census 2021 (ABS, 2021a), the study area accommodated 171,005 residents as at 2021, of which 40 per cent resided in the Wagga Wagga City LGA. As shown in Table 5-1, the resident population in the study area is projected to grow to 188,414 residents by 2041 (DPE, 2022a), which represents an annual growth rate of 0.5 per cent per annum. As shown in the final column of Table 5-1, most of this growth is expected to occur in the Goulburn-Mulwaree LGA.

Table 5-1: Study area projected population growth 2021-2041

LGA	2021*	2026**	2031**	2036**	2041***	Change 2021-24
Wagga Wagga City	67,609	68,981	70,381	71,810	73,267	5,658
Cootamundra-Gundagai Regional	11,403	11,325	11,248	11,171	11,095	-308
Goulburn-Mulwaree	32,053	33,921	35,898	37,990	40,204	8,151
Hilltops	19,254	19,237	19,220	19,203	19,186	-68
Snowy Valleys	14,891	14,736	14,582	14,430	14,279	-612
Upper Lachlan Shire	8,514	8,796	9,087	9,388	9,699	1,185
Yass Valley	17,281	18,075	18,906	19,775	20,684	3,403
Total / study area	**171,005**	**175,071**	**179,322**	**183,767**	**188,414**	**17,409**

*Source: ABS 2021h; ** Adjusted to align with the NSW Planning, Industry and Environment 2041 projected population, https://www.planning.nsw.gov.au/Research-and-Demography/Population-projections/Projections ;***NSW Planning, Industry and Environment projected population, https://www.planning.nsw.gov.au/Research-and-Demography/Population-projections/Projections

5.1.2 Employment profile

As shown in Table 5-2, in the 2022 March quarter, there were almost 3,500 residents unemployed in the study area. The study area's unemployment rate was at 4.1 per cent, down from 4.4 per cent in the corresponding quarter of the previous year (Economy.ID, 2022a,b,c,d,e,f,g). This is consistent with national trends and is reflective of the tighter labour market. However, unemployment remained high and above the regional NSW average (4.3 per cent) in the Hilltops and Goulburn-Mulwaree LGAs. The study area's declining unemployment rate may also, in part, be due to the decline in the labour force over this period and since 2020. As such some people previously unemployed may have dropped out of the labour force as discouraged workers. It also reflects the trend In regional NSW and Australia where larger towns such as Dubbo, Tamworth, Orange, Coffs Harbour, Albury and Wagga Wagga have enjoyed economic growth and diversification of industry while workers in the smaller LGAs (that are predominantly agricultural based) have been leaving these LGAs to the larger towns and capital cities for alternative work.

Table 5-2: Study area's labour force status:

LGA	2022			2021			2020			2019		
	Unemployed persons	Labour force	Unemploy-ment rate (%)	Unemployed persons	Labour force	Unemploy-ment rate (%)	Unemployed persons	Labour force	Unemploy-ment rate (%)	Unemployed persons	Labour force	Unemploy-ment rate (%)
Wagga Wagga City	918	35,690	2.6	1,535	35,478	4.3	1,929	37,416	5.2	1,608	35,335	4.6
Cootamundra-Gundagai Regional	137	5,233	2.6	218	5,202	4.2	263	5,482	4.8	261	5,210	5
Goulburn-Mulwaree	1,102	14,803	7.4	814	15,545	5.2	761	16,330	4.7	948	15,071	6.3
Hilltops	689	8,216	8.4	520	8,627	6	522	9,173	5.7	635	8,631	7.4
Snowy Valleys	182	7,142	2.5	295	7,100	4.2	359	7,535	4.8	298	7,203	4.1
Upper Lachlan Shire	160	4,118	3.9	131	4,325	3	115	4,505	2.6	129	4,255	3
Yass Valley	305	9,021	3.4	245	9,470	2.6	192	9,898	1.9	229	9,127	2.5
Total study area	**3,493**	**84,223**	**4.1**	**3,758**	**85,747**	**4.4**	**4,141**	**90,339**	**4.6**	**4,108**	**84,832**	**4.8**

Source: Economy .id (2022a,b,c,d,e,f,g)

As shown in Table 5-3, employment in the study area increased from 113,297 jobs in 2015 to 130,359 jobs in 2019 (ABS, 2020). The three largest industries by employment over this period were health care and social assistance, public administration and safety and retail trade. In 2019, the study area's construction and electricity, gas, water and waste services industries employed almost 7,610 persons and 1,241 persons, respectively and accounted for 6.9 per cent and 1.1 per cent of total jobs in the study area. Evidently, the latter two industries, particularly the construction industry, are major employers in the study area.

Table 5-3: Jobs by industry in the study area

Industry	2015	2016	2017	2018	2019
Total no. of employees	113,297	114,167	121,737	131,894	130,359
Agriculture, forestry and fishing	7.0%	6.8%	6.9%	8.1%	7.4%
Mining	0.5%	0.5%	0.5%	0.5%	0.6%
Manufacturing	7.0%	6.7%	6.6%	6.4%	6.3%
Electricity, gas water and waste services	1.2%	1.1%	0.9%	1.1%	1.1%
Construction	6.5%	6.4%	6.4%	6.8%	6.9%
Wholesale trade	3.1%	3.1%	3.1%	3.1%	3.0%
Retail trade	10.8%	10.4%	10.2%	10.0%	9.7%
Accommodation and food services	8.5%	8.8%	9.0%	8.4%	8.7%
Transport, postal and warehousing	4.7%	4.2%	4.4%	4.0%	3.9%
Information media and telecommunications	0.9%	0.8%	0.8%	0.7%	0.6%
Finance and insurance services	2.8%	2.9%	2.8%	2.7%	2.8%
Rental, hiring and real estate services	1.4%	1.6%	1.7%	1.6%	1.5%
Professional, scientific and technical services	4.2%	4.3%	4.7%	4.4%	4.4%
Administrative and support services	6.0%	6.2%	6.2%	6.7%	6.6%
Public administration and safety	10.5%	10.0%	10.3%	9.6%	10.0%
Education and training	9.1%	9.2%	8.8%	8.6%	8.4%
Health care and social assistance	12.0%	12.9%	12.7%	13.1%	13.8%
Arts and recreation services	1.2%	1.3%	1.3%	1.3%	1.3%
Other services	2.8%	2.8%	2.8%	2.9%	3.0%

Source: ABS (2021a,b,c,d,e,f,g), Data by Region

As of 2021, there were 5,457 construction workers working in the study area. An estimated 85 per cent of these construction workers also lived in the study area (Economy.ID 2022a,b,c,d,e,f,g) and hence 15% of these workers live outside the study area. Conversely there were 7,181 construction workers that live in the study area, which means that around 2,543 (35%) leave the study area to work.

5.1.3 Study area GRP and output

Gross regional product (GRP) is a measure of size or net wealth generated by the regional economy over one year. The study area's GRP was $9.3 billion in 2021 (Economy.ID, 2022a,b,c,d,e,f,g).

Gross output by industry is a gross measure of the total sales of each industry sector in a region (ie the industry revenue).

As shown in Table 5-4, the three largest industries in terms of output in the study area are:

- agriculture, forestry and fishing ($2.5 billion and 14 per cent)
- construction ($2.3 billion and 13 per cent).
- manufacturing ($2.3 billion and 13 per cent of total industry output).

The electricity, gas, water and waste industry also accounted for a notable four per cent of total industry output.

The gross value added (GVA) of an industry refers to the value of outputs less the costs of inputs. It also measures the contribution that the industry makes to the regions' wealth or gross domestic product (GDP). The main components of GVA are workers' remunerations, profits and government taxes.

As shown in Table 5-4, the three most productive industries in the study area are:

- agriculture, forestry and fishing ($932 million being 12 per cent of total GVA)
- public administration and safety ($912 million being 12 per cent of total GVA)
- health care and social assistance ($876 million being 12 per cent of total GVA).

Table 5-4: Study area gross output and GVA by industry

Industry	2020/21	
	Gross Output ($m)	GVA ($m)
Agriculture, forestry and fishing	2,477	932.2
Mining	277	118.5
Manufacturing	2,287	622.5
Electricity, gas, water and waste	652	251.5
Construction	2,296	734.8
Wholesale trade	535	268.9
Retail trade	733	439.2
Accommodation and food services	590	259.0
Transport, postal and warehousing	758	333.9
Information media and telecommunications	173	64.0
Financial and insurance services	476	277.4
Rental, hiring and real estate services	1,000	183.0
Professional, scientific and technical services	578	287.1
Administrative and support services	329	190.2
Public administration and safety	1,575	911.7
Education and training	862	586.3

Industry	2020/21	
	Gross Output ($m)	GVA ($m)
Health care and social assistance	1,302	876.3
Arts and recreation services	74	25.0
Other services	430	179.7
Total	**17,406**	**7,541.1**

Source: Economy.ID (2022a,b,c,d,e,f,g); HillPDA Research * The output is a summation of the industry output for each of the LGAs which form the study area as sourced from Economy.id. Note the Cootamundra-Gundagai Regional LGA output by industry data was not publicly available at the time of this report and a weighted average of the surrounding LGAs was applied to the total output of Cootamundra-Gundagai Regional LGA data to derive industry output for this region.

5.2 LGA economic baseline analysis

This section considers the economic base for each of the LGAs within the study area.

A more detailed analysis of the seven composite LGAs is provided in Appendix B.

5.2.1 Gross regional product

Table 5-5 includes the GRP for each of the LGAs.

Table 5-5: GRP ($m) by LGA

LGA	Headline GRP $m 2021	% change from previous year	Local industry GRP $m 2021	Local residents GRP $m 2021	Local industry to residents ratio 2021
Wagga Wagga City	4,202	1.9	3,481	3,602	0.97
Cootamundra-Gundagai Regional	504	-0.7*	-**	-**	-**
Hilltops	978	6.4	811	882	0.92
Goulburn-Mulwaree	1,735	3.4	1,468	1,547	0.95
Snowy Valleys	860	1.6	751	780	0.96
Upper Lachlan Shire	366	10.7	313	437	0.72
Yass Valley	621	1	564	1,219	0.46

* Headline GRP is the sum of all industries' estimated value added, plus a factor for ownership of dwellings. The value of accommodation is a part of the economy, but it is not part of any industry, so it is included separately. Ownership of dwellings includes actual rents received by landlords, and imputed rents representing the ongoing value of owner-occupied housing.

** Local Industry GRP shows the value of the local economy, generated by the workers in the LGA regardless of where they live, after taxes and dividends leave the area

*** Local Resident GRP refers to the economic output of the residents of the area regardless of where they work (ie reflects the income received by people that live in the LGA).

Source: Economy.id.com.au (2022b,c,d,e,f,g);

* % change from 2016 to 2021 as at Census since 2020 GRP data was not available on Economy.ID at the time of this report ** data was not available on Economy.id at the time of this report.

As shown in Table 5-5, 2021 GRP has increased from the previous year across most of the LGAs. With the exception of Cootamundra-Gundagai Regional LGA, which had no reported figures, local resident GRP exceeded local Industry GRP over this period. This suggests a leakage of economic productivity to other areas beyond the LGA.

5.2.2 Largest industries by output/ revenue

Table 5-6 shows the three largest industries by output (ie revenue) for each of the LGAs.

Table 5-6: Output of top three industry sectors for each of the LGAs as at 2020/21

Wagga Wagga City LGA	Cootamundra-Gundagai Regional LGA*	Hilltops LGA	Goulburn-Mulwaree LGA	Snowy Valleys LGA	Upper Lachlan Shire LGA	Yass Valley LGA
Manufacturing ($1.1b or 13.5% of total industry output)	-	Agriculture, forestry and fishing ($579.4m or 30.8% of total output)	Construction ($615.1m or 19.4% of total output)	Agriculture, forestry and fishing ($486.5m or 26.7% of total output)	Agriculture, forestry and fishing ($265.6 or 37.9% of total output)	Agriculture, forestry and fishing ($238.3m or 24.4% of total output)
Public administration and safety ($1.0b or 13.2% of total output)	-	Construction ($190.3m or 10.1% of total output)	Manufacturing ($359.2m or 11.3% of total output)	Manufacturing ($434.4 or 23.9% of total output)	Electricity, gas, water and waste services ($86.6 or 12.4% of total output)	Construction ($143.9m or 14.7% of total output)
Construction ($990.3m or 12.7% of total industry output)	-	Mining ($150.6m or 8% of total industry output)	Public administration and safety ($297m or 9.4% of total output)	Construction ($212.3m or 11.7% of total industry output)	Construction ($82.5m or 11.8% of total industry output)	Rental, hiring and real estate services ($99.7m or 10.2% of total output)

Source: Economy.id (2022a,b,c,d,e,f,g); *data was not available on Economy.id at the time of this report.

As shown in Table 5-6, the construction industry generates a significant proportion of the total output of all industries across all the study area LGAs (with the exception of the Cootamundra-Gundagai Regional LGA, since 2020/21 data was not available at the time of this report). Agriculture, forestry and fishing industry generates the most output across four of the seven LGAs.

5.2.3 Largest industries by value added

Table 5-7 shows the three most productive industries by LGA as at 2020/21.

Table 5-7: Value added of top three industry sectors for each of the LGAs as at 2020/21

Wagga Wagga City LGA	Cootamundra-Gundagai Regional LGA*	Hilltops LGA	Goulburn-Mulwaree LGA	Snowy Valleys LGA	Upper Lachlan Shire LGA	Yass Valley LGA
Public administration and safety ($583.6m or 16.8% of total industry value added)	-	Agriculture, forestry and fishing ($223.4m or 27.4% of total industry value added)	Health care and social assistance ($189.7m or 13.6% of total industry value added)	Agriculture, forestry and fishing ($176.7m or 24.5% of total industry value added)	Agriculture, forestry and fishing ($101.6m or 35.0% of total industry value added)	Agriculture, forestry and fishing ($90.6m or 22.0% of total industry value added)
Health care and social assistance ($456.8 or 13.1% of total industry value added)	-	Health care and social assistance ($69.2m or 8.5% of total industry value added)	Public administration ($183.9m or 13.2%)	Manufacturing ($128.2m or 17.7% of total industry value added)	Electricity, gas, water and waste services ($32.7m or 11.2% of total industry value added)	Construction ($46.2m or 11.2% of total industry value added)
Construction ($316.7m or 9.1% of total industry value added)	-	Mining ($67.5m or 8.3% of total industry value added)	Transport, postal and warehousing ($109.5m or 7.9%)	Construction ($68.8m or 9.5% of total industry value added)	Construction ($27.1m or 9.3% of total industry value added)	Health care and social assistance ($39.6m or 9.6% of total industry value added)

Source: Economy.id (2022a,b,c,d,e,f,g); * data was not available on Economy.id at the time of this report.

The construction and agriculture, forestry and fishing industries have been identified as productive industries across most of the LGAs within the study area. Note 2020/21 data was not available for Cootamundra-Gundagai Regional LGA at the time of this report).

5.2.4 Largest industry by employment

Table 5-8 shows the three largest industries by employment and LGA as of 2021.

Table 5-8: Top three industry sectors by employment (total) for each of the LGAs as at 2020/21

Wagga Wagga City LGA	Cootamundra-Gundagai Regional LGA*	Hilltops LGA	Goulburn-Mulwaree LGA	Snowy Valleys LGA	Upper Lachlan Shire LGA	Yass Valley LGA
Health care and social assistance (6,312 workers or 19% of total industry employment)	Agriculture, forestry and fishing (663 workers or 16% of total industry employment)	Agriculture, forestry and fishing (1,511 workers or 20% of total industry employment)	Health care and social assistance (2,307 workers or 18% of total industry employment)	Agriculture, forestry and fishing (1,023 workers or 16% of total industry employment)	Agriculture, forestry and fishing (947 workers or 35% of total industry employment)	Agriculture, forestry and fishing (663 workers or 15% of total industry employment)
Public administration and Safety (3,828 workers or 11% of total industry employment)	Health care and social assistance (554 workers or 13% of total industry employment)	Health care and social assistance (894 workers or 12% of total industry employment)	Retail (1,388 workers or 11% of total industry employment)	Manufacturing (864 workers or 13% of total industry employment)	Health care and social assistance (276 workers or 10% of total industry employment)	Construction (521 workers or 12% of total industry employment)
Education and Training (3,623 workers or 11% of total industry employment)	Retail (395 workers or 10% of total industry employment)	Retail (781 workers or 11% of total industry employment)	Public administration and safety (1,323 workers or 10% of total industry employment)	Health care and social assistance (715 workers or 11% of total industry employment)	Education and training (195 workers or 7% of total industry employment)	Health care and social assistance (496 workers or 10.9% of total industry employment)

Source: Economy.id (2022a,b,c,d,e,f,g), ABS (2021h)

The agriculture, forestry and fishing industry as shown in Table 5-8 is a major employer across most of the LGAs within the study area, along with health care and social assistance.

5.2.5 Jobs to residents ratio

Table 5-9 shows the jobs to residents ratio as at 2020/21 and demonstrates that there were less jobs than resident workers across all LGAs (with the exception of the Cootamundra-Gundagai Regional LGA, since 2020/21 data was not available at the time of this report).

Table 5-9: Job to resident ratio as at 2020/21 for each LGA

Wagga Wagga City LGA	Cootamundra-Gundagai Regional LGA*	Hilltops LGA	Goulburn-Mulwaree LGA	Snowy Valleys LGA	Upper Lachlan Shire LGA	Yass Valley LGA
0.98	-	0.89	0.91	0.97	0.65	0.41

Source: Economy.id(2022b,c,d,e,f,g) ; * Data was not available at the time of this report

5.2.6 Industry specialisation

Table 5-10 shows the major industry specialisations in terms of employment for each of the LGAs.

Table 5-10: Industry specialisation for each of the LGAs as at 2020/21

Wagga Wagga City LGA	Cootamundra-Gundagai Regional LGA*	Hilltops LGA	Goulburn-Mulwaree LGA	Snowy Valleys LGA	Upper Lachlan Shire LGA	Yass Valley LGA
Public administration and safety (Location Quotient to Regional NSW = 1.8)	Agriculture, forestry and fishing (Location Quotient to Regional NSW = 2.6)	Agriculture, forestry and fishing (Location Quotient to Regional NSW = 3.4)	Public administration and safety (Location Quotient to Regional NSW = 1.6)	Agriculture, forestry and fishing (Location Quotient to Regional NSW = 3.0)	Agriculture, forestry and fishing (Location Quotient to Regional NSW = 5.4)	Agriculture, forestry and fishing (Location Quotient to Regional NSW = 2.9)
Wholesale trade (Location Quotient to Regional NSW = 1.4)	Manufacturing (Location Quotient to Regional NSW = 1.5)	Wholesale trade (Location Quotient to Regional NSW = 1.3)	Transport, postal and warehousing (Location Quotient to Regional NSW = 1.3)	Electricity, gas, water and waste services (Location Quotient to Regional NSW = 2.1)	Electricity, gas, water and waste services (Location Quotient to Regional NSW = 2.8)	Accommodation and food services (Location Quotient to Regional NSW = 1.6)
Information media and telecom. (Location Quotient to Regional NSW = 1.4)	Transport, postal and warehousing (Location Quotient to Regional NSW = 1.5)	Mining (Location Quotient to Regional NSW = 1.1)	Construction (Location Quotient to Regional NSW = 1.2)	Manufacturing (Location Quotient to Regional NSW = 2.0)	Other services (Location Quotient to Regional NSW = 1.4)	Professional, scientific and technical services (Location Quotient to Regional NSW = 1.3)

Source: Economy.ID (2022a,b,c,d,e,f,g) ; ABS (2021h)

Agriculture, forestry and fishing is a significant major specialisation industry across all LGAs, with the exception of Wagga Wagga City and Goulburn-Mulwaree LGAs. Based on detailed spatial analysis of land use, the predominant agriculture and primary production land use in the study area is grazing, though forestry and cropping constitute a large proportion of the remaining land. Additional detail about land use, including spatial extents, can be found in *Technical Report 5 – Land Use and Property Impact Assessment.*

6.0 CONSTRUCTION IMPACTS

6.1 Introduction

This section assesses the likely economic impacts resulting from the construction of the project.

With consideration given to the type and scale of development, construction of the project is estimated to directly generate economic activity in the following industries:

- Construction, which is further subdivided as:
  - heavy and civil engineering construction–- which includes businesses whose primary activity is the construction of entire engineering projects or infrastructure such as transmission lines, along with specialty trade contractors, whose primary activity is the production of a specific component for such projects
  - construction services – which includes all establishments and contractors involved in the construction of all other components of the project, including land development and site preparation services
- professional, scientific and technical service, which is a large and diverse industry and includes design and assessment/approvals, legal and accounting services, architects, engineers, project management, computer system design and other consultants.

Key performance indicators in measuring economic impacts are:

- capital investment value
- gross output (gross revenue of the industry)
- gross value added (direct contribution to wealth or to the economy)
- construction related employment
- workers' remuneration.

The estimated economic impacts of the project are detailed in Section 6.3 to Section 6.5 and are derived from estimated capital investment value described in Section 6.2. It should also be noted that the analysis considers both direct and indirect impacts (ie multiplier impacts) associated with the design and construction of the project. Refer to Appendix C for further information on multiplier impacts.

6.2 Capital investment value

The design and construction of the project would require substantial capital investment, which would support significant employment in the regional and national economy as established in Section 6.4.1. The indicative design and construction cost (ie the capital investment value) has been sourced from the Project Assessment Conclusions Report (PACR) (2019) and is estimated at $3.27 billion, of which around eight per cent, or $266 million, relate to 'soft costs' being design, biodiversity offsets, project management, accounting fees, application fees and the like. The remaining $3 billion would be 'hard costs' being construction which comprises heavy and civil engineering construction and construction services[2].

[2] The cost of HumeLink was based on real 2021 dollars and has been recently revised to reflect 2023 real prices, taking into consideration cost increases in construction, building, material, skilled labour costs and global supply factors.

6.3 Gross output impact

The construction industry is a significant component of the national economy accounting for nine per cent GDP and employing over 1.16 million workers across Australia in 2021[3]. The industry has strong linkages with other sectors, so the impacts on the economy go further than the direct contribution of construction. This is known as the multiplier effect. Multipliers refer to the level of additional economic activity generated by a source industry.

There are two types of effects captured by multipliers:

- **production induced effects:** which are made up of:
  - direct effects: which constitutes all outputs and employment required to produce the inputs for construction
  - indirect effects: which is the induced extra output and employment from all industries to support the increased production of the construction sector
- **consumption induced effects:** which relates to the demand for additional goods and services due to increased spending by the wage and salary earners across all industries arising from employment.

Table 6-1 details the output multipliers and shows the impact of the change in demand generated by the development and the impact on the national, State and regional economies (ie the total economies of the seven LGAs that comprise the study area). The multipliers reflect the size of regional industries based on 2021 Census data. The forecast increase in total output at a national level is $9.4 billion, $8.9 billion at State level and $6.3 billion in the regional economy, as shown in Table 6-1.

Table 6-1: Gross output impact ($m)

Description	Direct effects	First Round Production induced effect	Industry support induced effect	Consumption induced effect	Total
Gross output in the region	3,121	1,133	599	1,465	6,318
Gross output in the State	3,251	1,649	1,460	2,517	8,876
Gross output in Australia	3,267	1,724	1,677	2,737	9,405

Source: Hill PDA Estimate using data from ABS Australian National Accounts: Input-Output Tables 2019-20 (ABS Pub: 5209.0)

6.4 Gross value added

The GVA of an industry refers to the value of outputs less the costs of inputs. It also measures the contribution that the industry makes to the regions' wealth or GDP. The main components of GVA are workers' remunerations, profits and government taxes.

Design and construction of the project would directly contribute around $1.3 billion to the regional economy. Accounting for the multiplier impacts (shown in Table 6-2), a total of $2.8 billion would be contributed and/or supported in the regional economy (measured in 2020 dollars). GVA at State and national level (contribution to gross State/domestic product) is higher at $4.0 billion and $4.3 billion, respectively.

[3] Industry cluster snapshot (2022) Australian Industry and Skills Committee

Table 6-2: Construction GVA impact ($m)

Description	Direct effects	First Round Production induced effect	Industry support induced effect	Consumption induced effect	Total
GVA in the region	1,289	453	257	779	2,777
GVA in the State	1,343	676	662	1,341	4,022
GVA in Australia	1,349	706	763	1,452	4,270

Source: Hill PDA Estimate using data from ABS Australian National Accounts: Input-Output Tables 2019-20 (ABS Pub: 5209.0)

6.4.1 Construction related employment

Every million dollars of design and construction work undertaken generates 1.97 job years[4]. Based on the estimated capital investment value, 6,450 job years would be directly generated nationally by the project as shown in Table 6-3.

Through production induced and consumption induced multiplier impacts, a total of 27,294 job years would be supported in the national economy from the construction of the project of which 25,817 of these job years would be generated and/or supported within NSW and 17,462 within the region.

Table 6-3: Construction employment impact (job years)

Description	Direct effects (FTE/$m)	First round production induced effect	Industry support induced effect	Consumption induced effect	Total
Employment in the Region	6,161	3,804	2,016	5,480	17,462
Employment in the State	6,418	5,491	4,789	9,119	25,817
Employment in Australia	6,450	5,681	5,340	9,822	27,294

Source: Hill PDA Estimate using data from ABS Australian National Accounts: Input-Output Tables 2019-20 (ABS Pub: 5209.0), ABS Census (2021h) Data

It should also be noted that a significant number of residents (7,181 residents) within the study area work in the construction industry (2022a,b,c,d,e,f,g) and as such the local workers would be able to provide a proportion of the labour inputs required to construct the project. Moreover, thirty-four per cent (34%) of these workers travel outside the study area for work. As such, the project would provide local employment opportunities for those skilled workers and in turn would contribute to improving the regional job containment ratio[5] in this industry.

6.5 Worker remuneration

Worker remuneration is what drives consumption induced impacts in the region. As workers earn money, this increases demand for accommodation, food and groceries, services and other living expenses, which flows through the economy.

For every dollar spent on construction $0.22 goes to the construction workers in increased salaries.[6] Based on the estimated capital cost, workers' remuneration nationally would increase by $728 million directly as a result of the project as shown in Table 6-4. Including multipliers, the forecast increase in total salaries at a national level is $2.2 billion, $2.1 billion at State level and $1.5 billion in the regional economy, as shown in Table 6-4.

[4] Source: ABS Australian National Accounts: Input – Output Tables 2019-20 (ABS Pub: 5209.0) adjusted to 2019 dollars
[5] The ratio of jobs in the area to working residents in a particular industry or in all industries
[6] Source: ABS Australian National Accounts: Input – Output Tables 2019-20 (ABS Pub: 5209.0)

Table 6-4: Impact on workers' remuneration ($m)

Description	Direct effects	First Round Production induced effect	Industry support induced effect	Consumption induced effect	Total
Remuneration multipliers Regional economy	0.223	0.086	0.045	0.115	0.469
Remuneration multipliers State economy	0.223	0.122	0.109	0.193	0.647
Remuneration multipliers National economy)	0.223	0.126	0.122	0.207	0.677
Remuneration ($million) Regional economy	696	267	140	360	1,463
Remuneration ($million) State Economy	725	396	355	626	2,102
Remuneration ($million) National economy	728	411	398	675	2,212

Source: Hill PDA Estimate using data from ABS Australian National Accounts: Input-Output Tables 2019-20 (ABS Pub: 5209.0), ABS (Census 2021h) Data

6.6 Other impacts

6.6.1 Worker expenditure

The temporary construction workers required for the project would also benefit the regional economy. Temporary construction workers would spend a proportion of their total retail spend near their place of work, benefiting those businesses and retailers within the study area. This additional worker spend has been captured in the consumption induced effects in Sections 6.3 to 6.5.

6.6.2 Tourism and accommodation

Based on preliminary research undertaken by Transgrid to inform the development of the Accommodation Strategy, it was identified that there would be a shortfall of short-term rental accommodation (motels, hotels and caravan parks) and that a dedicated project accommodation facility at Tumbarumba would be required to support the construction of the project. Some construction workers are likely to seek accommodation in nearby holiday parks or rental housing given the costs of hotels and motels. This may result in some temporary increase in demand and cost for this type of accommodation over the construction period. This would result in increased competition for accommodation between the project construction workers and others, such as tourists, particularly during peak times, and could result in temporary increases in accommodation rates. Transgrid will prepare a Worker Accommodation Strategy prior to the commencement of construction. Councils and other relevant stakeholders will be consulted to identify additional potential options for temporary worker accommodation during construction. The strategy will aim to maximise benefits for the communities within the study area and minimise potential social and economic impacts.

A proportion of the project's construction workers are also likely to use hotels and motels in the study area. This would provide a temporary boost in revenue for these types of accommodation during the construction period. These benefits have been captured in the consumption induced effects in Sections 6.3 to 6.5[7]. The exact proportion of construction workers requiring accommodation at either a hotel or motel is difficult to quantify at this stage. This would be heavily dependent on the proportion of the project's construction workers that reside beyond the study area and the length of time that they would be required to work on the project. It is assumed

[7] Consumption induced impacts in the locality or region refer to the additional economic activity generated from increased demand for goods and services from the project workers earning wages. These workers will generate demand in the region for accommodation, food, commercial and personal services, transport, etc.

given the higher room rates associated with hotels and motels, construction workers, particularly those working for extended periods of time, are more likely to opt for the more affordable caravan parks or short-term homestay options.

The project may also result in an increase in visitation and tourism spend (both in accommodation and other goods and services) in the study area, as family and friends of the project construction workers visit the study area to spend time with those workers.

Conversely, construction activities (such as traffic impacts, noise and visual impacts) near national parks and State forests could also discourage some visitors and have an adverse impact on tourism. The extent of this impact is uncertain and difficult to estimate without data on the number of tourists visiting the study area primarily for its national parks and State forests. There is no data that can be used or sourced to enable that assessment to be made. In all likelihood, any adverse impacts on tourism resulting from the construction disturbances would be more than outweighed by the benefits of consumption induced impacts in the study area resulting from additional workers. This would benefit existing businesses in the study area in retail, hospitalities, food services and the like.

6.6.3 Employment crowding out

If labour resources within a region are limited and worker-migration or commuter workers from beyond the region of impact is restricted, the project could result in increased labour market competition which could drive up local wages and 'crowd out' economic activity in other industries of the economy. This would typically occur if the region was at close to full employment. However, this is not the case for the regional economy. The study area's economy is not at full employment as established in Section 5.1.2 (ie unemployment rate of 4.1 per cent in 2021 (Economy.ID, 2021)) with considerable mobility of labour to and from the study area (ie 13 per cent of workers are from beyond the study area (ABS Census, 2021)). As such, the employment crowding out effect is likely to be minimal. Even if there were some crowding out of some economic activity in other industries, this would represent a case of labour resources being reallocated to higher valued economic activities and would yield a stronger economic outcome for the local and broader community. Notwithstanding some losses, the net impact on the regional economy is strongly positive.

6.6.4 Temporary loss of existing land use

As identified in the *Technical Report 5— Land Use and Property Impact Assessment*, construction of the project would require temporary project infrastructure (including construction compounds, helicopter facilities and worker accommodation facilities) to be established to support the construction activities. This infrastructure would be located on private and public property and may prevent the use of the area for existing land use. The report suggests that the transmission line and other construction and operational assets have been located, through discussions with landowners, to minimise impacts to property. Moreover, areas within the project footprint that are not required for operational purposes, including construction compounds, worker accommodation facility and temporary access tracks, would be returned to a similar condition as the existing land post construction. As such, economic impacts of the temporary project infrastructure to the region are considered minimal.

6.6.5 Temporary impacts on agricultural productivity

As reported in *Technical Report 4 – Agricultural Impact Assessment,* the direct impact of the project on agricultural production is estimated to be relatively low during construction, with minor impacts on agricultural productivity. The value of agricultural production in 2020-21 across 568 hectares of agricultural land directly impacted by construction is estimated at $335,120 per annum over a two and half year construction period.

Therefore, the economic impacts of the project on existing agricultural enterprises at the regional level would be considered minimal. An estimated $335,120 per annum of agricultural production is estimated to:

- result in a loss of gross output of around $837,800 over two and half years of disruption
- result in a loss of 1.2 full-time-equivalent job, based on an average output per worker of $282,250 per annum (IBIS, 2020) – equivalent to 3.0 jobs years (1.2 FTE jobs over two and a half years of disruption)
- reduce total worker remuneration by around $28,800 per annum, assuming an average salary of $21,730 (IBIS, 2020) – approximately $64,500 over 2.5 years
- reduce total GVA by around $117,000 per annum, assuming a GVA per worker of $98,500 (IBIS, 2020) – equivalent to around $292,400 over the construction period.

6.6.6 Impacts on forestry

As sourced from *Technical Report 5 – Land Use and Property Impact Assessment*, the project footprint intersects approximately 1,089 hectares of production native and plantation forest land use areas. This represents around 0.5 per cent of the total production native and plantation forest land use across the directly impacted LGAs. Forestry and timber processing are important land uses to the regional economy, particularly to the Snowy Valleys LGA.

Construction of the project may result in temporary impacts to forestry land through the establishment and use of the following construction compounds:

- Maragle 500 kV substation compound (C05) – production native forestry
- Honeysuckle Road compound (C07) – production native forestry
- Red Hill Road compound (C08) – production native forestry
- Adjungbilly Road compound (C09) – plantation forestry (private forest)
- Snubba Road compound (C16) – production native forestry.

Based on the indicative concept design it is likely that the construction of the project would result in up to 375.9 hectares of production native forestry land and 16.2 hectares of plantation forestry being impacted during construction, subject to detailed design. Of this, 37 hectares would be located within construction compounds. For both these forestry land uses, this represents a temporary loss of less than 0.2 per cent of the respective total forestry land across the directly impacted LGAs.

In a worst case scenario 391.2 hectares of forestry land would be permanently lost if not replaced. Assuming a $1,300 value for log harvesting per hectare of forestry land this would amount to an economic cost of almost $510,000 every year[8]. The net present value at a 5% discount rate over 30 years equates to $7.84 million which is insignificant when compared to the GRP of $9.3 billion of the economic study area. This is considered a worst case scenario where forestry land is not replaced. It is noted that the land within the construction compounds would be temporarily lost from production during construction of the project however this land would be remediated for forestry use post construction (refer to Section 7.3). The cost of remediating land and replanting in these areas has been included in the capital costs and is accounted for in Sections 6.3 to 6.5. It should further be noted that most impacts to forestry at Maragle 500 kV substation compound (C05) will be carried out as part of the Snowy 2.0 Transmission Connection project.

In terms of any permanent losses in private plantation, owners would be compensated under just terms under the *Land Acquisition (Just Terms Compensation) Act 1991* for any loss of forest.

[8] Economic cost was calculated by dividing total value of logs harvest by total hectares available for logging. Source: "Australian forest and wood production statistics" Australian Government Department of Agriculture, 2018 and 2022"

7.0 OPERATIONAL IMPACTS

This chapter considers other economic impacts including operational impacts associated with the project.

7.1 Reliable and affordable power

The project would provide a new transmission connection to reinforce the NSW Southern Shared Network and increase transmission capacity between new generation sources, including the expanded Snowy Hydro and, in combination with the EnergyConnect project, the region's demand centres. The project also forms a key part of the transmission line network that supports the transfer of energy in the NEM.

HumeLink is also a key component in delivering the ODP defined in the ISP which seeks to 'create a modern and efficient energy system that delivers $24.5 billion in net market benefits, and meets the system's reliability and security needs through its transition, while also satisfying existing competition, affordability and emission policies'. Implementation of the ODP would:

- allow new energy sources to come online, including renewables and enable greater sharing of energy between the eastern states
- transform the national electricity grid which needs to expand its capacity to meet the needs of new and future renewable energy projects
- would enable a more secure and reliable national electricity grid
- enable NSW businesses and households to have greater access to reliable and affordable electricity.

Moreover, the project is estimated to contribute roughly $1.3 billion of the $24.5 billion in net market benefits delivered by the ODP in the most likely scenario and delivers value in all scenarios (AEMO,2022). These market benefits include:

- avoided unserved energy
- avoided fuel costs
- avoided generation/storage costs (excluding fuel costs)
- avoided REZ transmission capital expenditure
- avoided voluntary load curtailment
- competition benefits (including wholesale market cost savings and demand response benefits).

7.2 Impacts on the agricultural industry

The agricultural impacts of the project were assessed in *Technical Report 4 – Agricultural Impact Assessment.* The findings from the assessment are as follows:

- Agricultural land uses are predominant with livestock, cropping and horticultural enterprises together comprising around 84 per cent of the project footprint. The part of the agricultural study area west of the Hume Highway is dominated by cropping. There are substantial orchards around Batlow. Grazing dominates land use elsewhere. Sheep and cattle account for almost all grazing livestock.
- The total gross value of agricultural production across the five LGAs of Wagga Wagga City, Snowy Valleys, Cootamundra-Gundagai Regional, Yass Valley and Upper Lachlan Shire which include the agricultural study area averaged $590 per hectare in 2020-21. However, this varies from approximately $88,800 per hectare for horticulture production and $1,100 per hectare for broadacre cropping, to $418 per hectare for grazing production.

- The total area of agricultural land affected is assessed at approximately 2,171.1 hectares. However, the vast majority of this area consists of the transmission line easement (1,912.3 hectares). Agricultural land uses including grazing would essentially continue in this area during operation.
- Therefore, the area of agricultural land use that would be lost during operation is estimated at 258.8 hectares. This is equivalent to 0.02 per cent of the total area of agricultural holdings in the five impacted LGAs or 3.0 per cent of the project footprint on agricultural land. Cropping in this area would be precluded, but grazing could continue in parts of this area, such as underneath and around transmission line structures.

The overall conclusion from *Technical Report 4 – Agricultural Impact Assessment* is that the likely impacts on agricultural output is minimal due mainly to the fact that the project affects only a small fraction of total agricultural land in the five LGAs considered in the report and assuming implementation of the recommended mitigation measures.

Therefore, the economic impacts of the project on existing agricultural enterprises at the regional level would be very minimal. An estimated 258.8 hectares of permanently lost agricultural holdings as sourced from *Technical Report 4 – Agricultural Impact Assessment* is estimated to:

- reduce gross output by around $150,000 per annum[9], which equates to less than 0.02 per cent of total agricultural, forestry and fishing gross output in the study area
- result in a loss of 0.54 full-time equivalent jobs, assuming an average output per worker of around $282,250 (IBIS, 2020)
- reduce total GVA by approximately $60,000 per annum, assuming a GVA per worker of $98,500 (IBIS, 2020).

7.3 Impacts on forestry

The impact of construction compounds on State forest land identified in Section 6.6.6 would no longer apply once construction work is complete, in part due to construction compounds being returned to their previous condition.

For the purpose of this assessment, it is assumed that vegetation within the easement would be cleared or restricted in height for safety and operation reasons. Forestry would no longer be an appropriate land use within the transmission line easements.

As a worst case scenario, the project footprint has been used to broadly calculate the potential extent of land clearing as it covers all project infrastructure including access tracks. The actual extent of clearing would be substantially less as the ultimate easement is more than half the size of the project footprint and not all areas within the easement would require clearing. Based on the indicative concept design it is likely that the project would result in approximately 347.7 hectares of production native forestry land and 4.1 hectares of plantation forestry land being permanently removed from production as a result of the project, subject to detailed design. This would equate to approximately 0.2 per cent of the total area of forestry land use within the directly impacted LGAs. Further detail on forestry clearance for operation of the project is provided in *Technical Report 1 – Biodiversity Development Assessment Report*. Refer to Section 6.6.6 for details on the worst case economic loss associated with permanent removal of forestry land.

Analysis of satellite imagery confirmed that the majority of the area classified as forestry land uses was forested, with only a small portion being cleared. In addition to direct impacts associated with land clearing, restrictions on operating within and near Transgrid easements may further reduce or alter access arrangements for forestry equipment on a permanent basis.

[9] as sourced from the *Technical Report 4 – Agricultural Impact Assessment*

As stated above in Section 6.6.6, owners would be compensated under just terms under the *Land Acquisition (Just Terms Compensation) Act 1991* for any permanent loss of forest land. These costs would be internalised to form part of the project capital cost and as such it is assumed there would be no economic impacts.

Additional information on land use impacts can be found in *Technical Report 5 – Land Use and Property Impact Assessment.*

8.0 CUMULATIVE IMPACTS

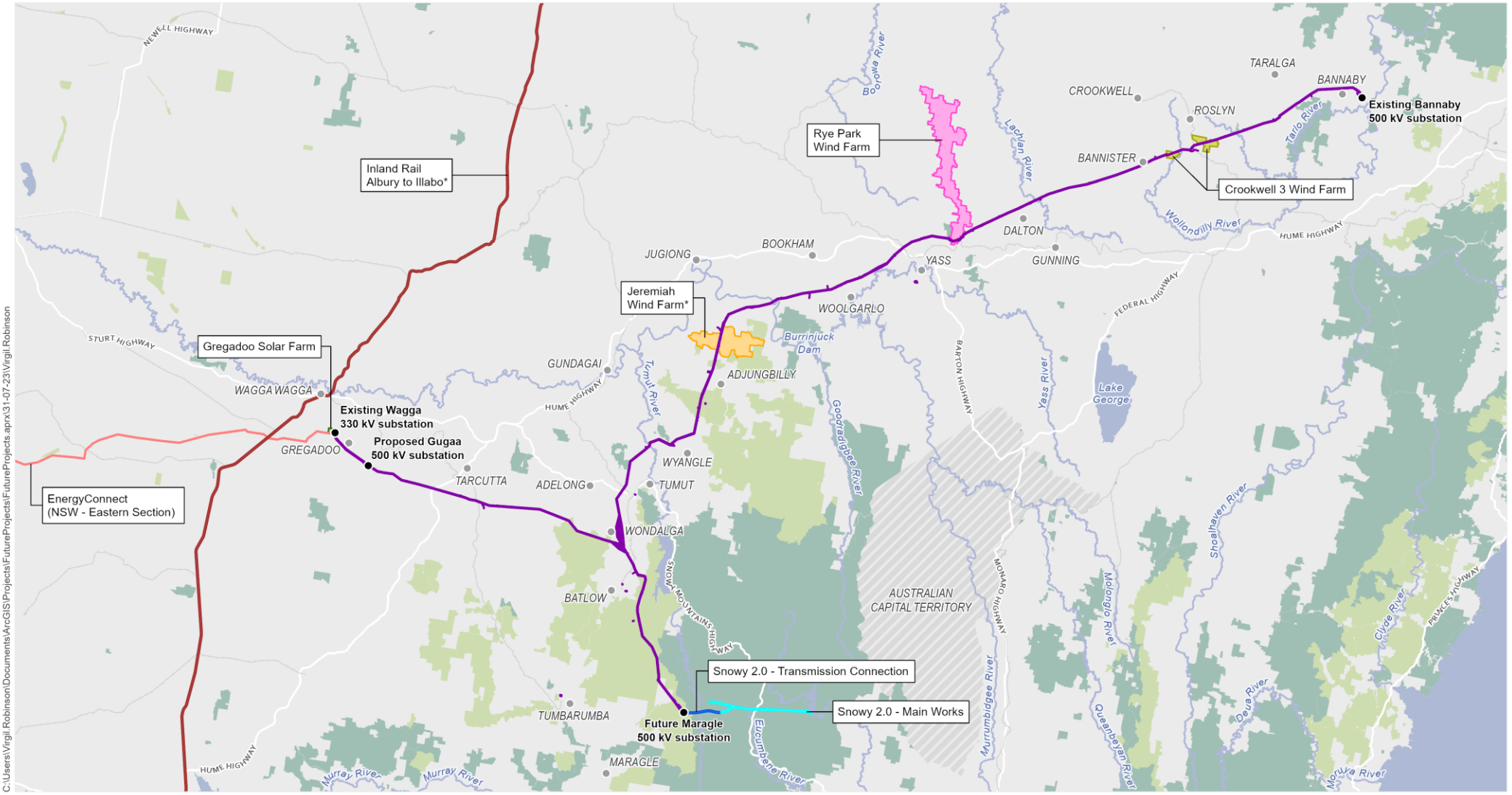
This section has been prepared in accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPE, 2022) and identifies the potential cumulative economic impacts anticipated as a result of the project, in addition to other relevant future projects occurring within the study area (being the LGAs of Wagga Wagga City, Snowy Valleys, Yass Valley, Cootamundra-Gundagai Regional Upper Lachlan Shire, Goulburn-Mulwaree, and Hilltops). The study area hosts a number of major projects, both under construction and at various stages of the planning process. Searches for relevant projects were carried out in March 2023 and included the following data sources:

- DPE's Major Projects register
- DPE's Southern Regional Planning Panel project register
- NSW Independent Planning Commission project register
- EPBC Act Public Portal
- Transport for NSW Projects Map.

Based on the above searches, the following projects have been considered in combination with the project to develop a high-level assessment of any cumulative economic impacts that may arise from their combined effect The projects with the potential for cumulative impacts were identified, and shown in Figure 8.1, through a review of publicly available information and include the following:

- EnergyConnect (NSW – Eastern Section)
- Gregadoo Solar Farm
- Jeremiah Wind Farm
- Rye Park Wind Farm
- Victoria to NSW Interconnector West (VNI West)
- Snowy 2.0–- Transmission Connection Project
- Snowy 2.0–- Main Works
- Crookwell 3 Wind Farm
- Inland Rail – Albury to Illabo.

Each of these projects is examined in the following sections.



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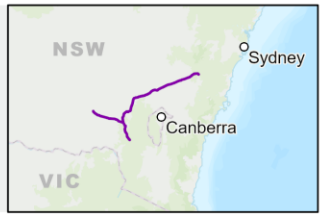
Project footprint
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway
Substation

Relevant future projects

Crookwell 3 Wind Farm
EnergyConnect (NSW - Eastern Section)
Gregadoo Solar Farm
Inland Rail Albury to Illabo*
Jeremiah Wind Farm*
Rye Park Wind Farm
Snowy 2.0 - Main Works
Snowy 2.0 - Transmission Connection



*Note: Subject to approval

Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

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Projection: GDA 1994 MGA Zone 55

FIGURE 8-1: Relevant future projects

8.1 EnergyConnect (NSW – Eastern Section)

The EnergyConnect (NSW – Eastern Section) project includes the construction and operation of a new high voltage transmission line between the existing Buronga substation and existing Wagga 330 kV substation, a new 330 kV substation (referred to as the proposed Dinawan 330 kV substation), upgrade and expansion of the existing Wagga 330 kV substation as well as other ancillary infrastructure. Construction of the project began in early 2023 and is expected to be completed in late 2024.

Based on the findings of the Economic Impact Assessment prepared for the EnergyConnect project (Gillespie, 2021), the estimated total economic impact of the EnergyConnect project of the non-wage expenditure ($106.2 million) on the regional economy (comprising the local government areas of Wentworth, Balranald, Murray River, Edward River, Hay, Murrumbidgee, Federation, Lockhart and Wagga Wagga), during the first year (a full year) of construction is estimated at up to:

- $159 million in annual direct and indirect regional output
- $70 million in annual direct and indirect value–added
- $36 million in annual direct and indirect income
- 571 direct and indirect jobs.

The flow-on economic impact of the incremental wage spending ($3.9M) of the estimated 100 local people directly employed during the first year (a full year) of construction is estimated at up to:

- $3 million in annual direct and indirect regional output
- $2 million in annual direct and indirect value–added
- $1 million in annual direct and indirect income
- 17 direct and indirect jobs.

Total annual employment generated by the proposal during the first year of construction for people that live permanently in the region amounts to 698 jobs. The second year of construction (six-months) would provide half the above level of regional economic activity.

Although the nature of the impacts for the EnergyConnect project are similar to HumeLink, the cumulative impact on the HumeLink's regional economy would be minimal as the area of impact differs between the two projects, with only the City of Wagga Wagga falling within both project's regional economy. Both projects combined would provide positive local employment and business opportunities in the Wagga Wagga City LGA over the period of 2022 to 2026. Construction of the EnergyConnect project would largely occur ahead of the HumeLink project, as such cumulative construction impacts and any increased risk of local worker shortages and accommodation shortages are likely to be minimal.

8.2 Gregadoo Solar Farm

The Gregadoo Solar Farm would be located about 13 kilometres south-east of Wagga Wagga, adjacent to the Wagga 330 kV substation. The project is proposed to comprise construction, operation and decommissioning of a maximum 47 megawatt solar farm and associated infrastructure. The project was approved on 11 December 2018 and construction is expected to commence mid-2023 and last 9 months.

The EIS for Gregadoo Solar Farm (NGH, 2018) states the project would generate up to 150 full-time construction jobs, with a capital investment of up to $61.5 million as well as two to three operational jobs. As such the Gregadoo Solar Farm would have a positive impact on local employment in HumeLink's regional economy, albeit a small impact, given the project's smaller scale and nature. Cumulative construction impacts (ie increased demand for services, workers and accommodation shortages) are likely to minimal given Gregadoo Solar Farm's peak construction period is likely to occur prior to the construction of HumeLink.

8.3 Jeremiah Wind Farm

Jeremiah Wind Farm project is located approximately 29 kilometres east of Gundagai and proposes to construct, maintain and operate a 65-wind turbine generator wind farm and associated infrastructure. An EIS is in preparation. HumeLink transmission lines would pass through the Jeremiah Wind Farm development area. Project approval is anticipated in 2023 and construction is expected to take 24-30 months.

The scoping report (Eco Logical Australia Pty Ltd, 2021) estimate that Jeremiah Wind Farm would support 250 full-time jobs during the two-year construction phase, requiring local services and amenities in the Cootamundra-Gundagai Regional LGA as well as a further 12 full-time equivalent jobs during the 30-year operational life of the project. As such the Jeremiah Wind Farm would have a positive impact on local employment in HumeLink's regional economy, albeit a small impact relative to HumeLink given the project's smaller scale and nature. Based on the proposed construction programs, Jeremiah Wind Farm's peak construction phase potentially would coincide with the peak for HumeLink. The number of employees required to deliver the projects would be met by employing workers within commuting distance of the projects or internal migration, with the latter resulting in increased demand for amenity, services and accommodation in and around the Gundagai region. Assuming a 60 per cent occupancy rate across existing accommodation facilities around Gundagai and Tumut and 70-80 per cent of construction workers requiring accommodation over this period (considered a conservative estimate), existing accommodation facilities should be sufficient to accommodate these workers. Any temporary worker accommodation facility between the Gundagai and Yass region would alleviate any risks of accommodation shortages further.

8.4 Rye Park Wind Farm

The proposed Rye Park Wind Farm is located to the north of Yass and east of Boorowa, NSW in the vicinity of the township of Rye Park. It is proposed to generate up to 327 megawatts of power with a potential for over a terawatt hour of production each year. Construction commenced in December 2021, and is expected to take 18 to 24 months.

The economic impact assessment (Hudson Howells, 2020) for the project estimated that project would:

- generate $186 million of value added in the State of NSW and $43 million of value added to the ACT – or a total of $229 million, over a three-year construction period
- support 1,204 job years in NSW and 242 in the ACT (total of 1,446)– or an average of over 401 jobs and 81 respectively (total of 482) sustained per year over three years
- support annually $8.3 million of value added in NSW and $0.4 in the ACT once operational, and support directly and indirectly of the order of 51 and 3 jobs respectively per year
- locally the modelling indicates that the project would:
    1. generate $26.6 million of value added (contribution to Gross Regional Product) in LGA's of Yass Valley, Upper Lachlan Shire and Hilltops over a three-year construction period
    2. support 179 job years for local residents, or an average of 60 jobs sustained per year over three years
    3. once operational generate $4.4 million of value added in the local area annually, and support directly and indirectly (including the induced impact) approximately 29 jobs per year.

The local economy for Rye Park Wind Farm forms part of the regional economy for HumeLink. The Rye Park Wind Farm would further stimulate economic activity and lead to a positive impact on local employment. The value added and local employment estimates provided in the economic impact assessment for Rye Park Wind Farm would be on top of those estimates calculated for HumeLink's regional economy in Sections 6.4 to 6.4.1.

Given the construction of Rye Park Wind Farm would largely be completed by the time construction for the HumeLink project commences, there would be no cumulative pressures on local accommodation and services. As such the cumulative economic impacts of both projects are considered positive for the regional economy.

8.5 VNI West

The VNI West project involves the development of a new 500 kV targeted interconnector between Victoria and NSW to address transmission network limitations and improve supply reliability. VNI West is still in scoping and market modelling phase to assess the technical and economic viability of expanding transmission interconnector capacity between Victoria and NSW. Proposed to commence construction in 2026 with commissioning by 2028. Specific economic impacts on the regional economy are not known at stage. The project would likely generate significant economic activity and have a positive impact on employment. The impacts of transmission lines on the economy at State level are likely to be substantial. Potential impacts of the VNI West project on HumeLink's regional economy (ie potential cumulative impacts) are likely to be less substantial given the distance between the projects and their likely area of influence.

8.6 Snowy 2.0 – Transmission Connection Project

The Snowy 2.0 – Transmission Connection Project involves the construction and operation of an overhead transmission line connection and substation to connect Snowy 2.0 to the NEM. This includes construction of a new 500/330 kV substation in Bago State Forest (future Maragle 500 kV substation), new access tracks and upgrade of existing access tracks and ancillary works to support construction. The project was approved in September 2022. Construction is expected to begin in late 2023 with expected completion by end of 2025.

The socio-economic report (Jacobs, 2020) prepared as part of the EIS estimates that the Snowy 2.0 – Transmission Connection project would support an average of around 75 jobs over the 39-month construction program, with this growing to around 140 jobs during peak periods. The report also acknowledges that the project would:

- Likely generate indirect jobs in local, regional and national businesses and industries from increased economic activity and spending at businesses providing goods and services to support construction activities. The number of indirect jobs has not been quantified for the project.
- Lead to economic benefits or accommodation owners, associated with increased demand for short-term accommodation for construction workers, particularly in Tumbarumba.

Based on the proposed construction programs, the construction phases for both Snowy 2.0 and HumeLink are likely to coincide, and could place pressure on accommodation and other services in and around Tumbarumba. Assuming a 60 per cent occupancy rate across existing accommodation facilities around Tumbarumba and 70-80 per cent of construction workers requiring accommodation at around the same time (considered a conservative estimate) would suggest demand for accommodation would exceed capacity.

A temporary accommodation facility in around this area is proposed to reduce the risk of this occurring. According to the Snowy 2.0–- Transmission Connection project Amendment Report "construction personnel working in the project area west are expected to be accommodated in Tumbarumba, which is located approximately 40 kilometres (approximately 30 minutes' drive) from the substation site. Consultation undertaken with Snowy Valleys Council has confirmed that Tumbarumba has sufficient capacity to support the workers in project area west."

As part of the HumeLink Project a temporary worker accommodation facility is currently being planned on a site 3.2km from Tumbarumba town centre to accommodate up to 200 workers (refer to Section 9.0).

Aside from potential accommodation shortages, the cumulative economic impacts of both projects are considered positive, with an increase in employment opportunities during the construction phases and increased business for local shops, food outlets and industries supplying goods and services to the construction workers and construction activities.

8.7 Snowy 2.0 – Main Works

The Snowy 2.0 – Main Works project involves the development of an underground pumped hydro power station and ancillary infrastructure linking the existing Tantangara and Talbingo Reservoirs. The main works at Talbingo Reservoir site include excavated rock placement, portal construction and tunnelling, access roads and ancillary facilities for emplacement activities and tunnelling support. Construction began in October 2020 with expected completion by 2026. The EIS has been prepared for the project (EMM, 2019). Based on a capital investment value of $4.6 billion, the EIS estimates the Snowy 2.0 Main Works project would:

- deliver substantial economic benefits to the local region, NSW and NEM states more broadly, with key drivers being the direct investment to establish the project, wage expenditure, reduced ongoing electricity fuel costs, and reduced electricity costs
- contribute $2,692 million in Gross State product across NSW and the ACT
- deliver increased average annual additional wage expenditure of $8 million in the regional economy (comprising local economies of Snowy Monaro Regional and Snowy Valleys LGAs)
- provide a substantial number of jobs, with the construction workers required for the Snowy 2.0 – Main works expected to peak at around 2,000 personnel in 2023, whilst the operational workers is expected to be 8-16 staff, with fluctuations of additional workers required during major maintenance activities.

As such the cumulative economic impact of both projects are considered positive as both projects would generate significant economic activity and lead to substantial positive employment both regional and at State level. As there is likely to be an overlap in the project's construction period (along with the Snowy 2.0 – Transmission Connection Project) this may lead to potential increased pressure on local accommodation and services around Tumbarumba and Barlow region. A temporary accommodation facility in around this region is proposed to reduce the risk of this occurring. As part of the HumeLink Project a temporary accommodation facility is proposed on a site 3.2km from Tumbarumba town centre to accommodate up to 200 workers (refer to Section 9.0). Additional cumulative impacts are also considered in the *Technical Report 7 – Social impact assessment*.

8.8 Inland Rail – Albury to Illabo

This project forms part of the Inland Rail project and includes works to structures and sections of track along 185 kilometres of existing operational standard gauge rail from the Victoria/New South Wales border to Illabo in regional NSW. Construction is proposed to commence in early 2024 and is expected to take about 16 months.

The project is expected to have minimal impact on marginal employment during operations but jobs is likely to peak at 770 during construction. There is likely to be some overlap in construction timing potentially contributing to labour and accommodation shortages in Wagga Wagga City LGA with a large influx of workers using short-term accommodation during the scheduled rail possessions in March and September 2024. Without mitigation, this demand would have an impact on the local economy when short-term accommodation demand is high. A workforce accommodation strategy would be prepared to manage demand on local accommodation and detailed construction planning would look to scheduling opportunities to minimise the peak demand on the short-term accommodation market.

There's unlikely to be any cumulative impacts post construction.

8.9 Crookwell 3 Wind Farm

This is a project for 16 wind turbines up to 157 m in height, connected to the grid via the 330 kV transmission line which is adjacent to the Crookwell 2 Wind Farm, approximately 18.5 kilometres south east of Crookwell in the Upper Lachlan Shire. The project has EIS approval and detailed design and pre-construction activities are being carried out with main construction work expected to take about 18 months once commenced.

Capital investment value is between $90m and $110m and is likely to result in 40 FTE jobs on site during the construction phase. Construction is expected to be completed before the construction commencement of HumeLink and hence cumulative impacts are likely to be negligible.

8.10 Summary

Overall, the construction of HumeLink and the aforementioned projects would lead to substantial economic benefits at a regional and at a State level, through positive local employment, wage expenditure and increased economic activity. It should be noted, however, that construction of HumeLink and other projects such as Snowy 2.0 – Main Works and Transmission Connection projects concurrently would increase the demand for local workers. That may result in temporary labour shortage that would need to be met with commuter workers or internal migration. The migration of outside workers would increase the demand for rental housing and accommodation. These cumulative accommodation impacts will be addressed with the delivery of the proposed accommodation facility in Tumbarumba that will house up to 200 workers during the construction phase.

9.0 MANAGEMENT OF IMPACTS

The mitigation measures that would be implemented to avoid or minimise potential economic impacts are summarised in Table 9-1 below.

Transgrid has and would continue to liaise with landowners, community members, local councils and interest groups to identify methods to minimise project impacts, where possible, and maximise benefits for the region. Moreover, the severity of impact and level of economic stimulus would be influenced by the extent to which the business community can provide labour and input to support the construction and ongoing operation of the project.

Table 9-1: Summary of mitigation measures

Impact	Mitigation measures	Timing	Mitigation measures
Local employment	A Local Industry Participation Plan, an Australian Industry Participation Plan, a Workforce and Workforce Development Plan and an Aboriginal Participation Plan will be prepared and implemented.	Detailed design and construction	All locations
Potential business impacts	Liaison will occur with local councils, interest groups, economic development organisations, local chambers of commerce and State government to: ■ notify local businesses of the goods and services required by the project, service provision opportunities and compliance requirements of businesses to secure contracts ■ encourage and support local business in meeting the requirements of the project for supply contracts ■ assist qualified local businesses to tender for provision of goods and services to support the construction of the project, where possible.	Detailed design and construction	All locations

10.0 CONCLUSIONS

The project includes the construction and operation of around 360 kilometres of new electricity transmission lines, substations, permanent and temporary access tracks and roads, and ancillary facilities required during construction.

Construction of the project is targeted to commence in 2024, subject to the required planning and regulatory approvals. Once construction has commenced, the project is estimated to take approximately 2.5 years to build and would become operational by the end of 2026.

The project aligns with the State, regional and local planning policies and strategies as it has been positioned to unlock REZs and provide connections to other major interconnectors (including the expanded Snowy Hydro Scheme). The project would also enable the transfer of renewable energy sources, enhancing the region's reputation as a hub for renewable energy (a key direction for South East and Tablelands region) and help to provide economic diversification and create jobs a key theme across all regional and local policies. In addition to creating new jobs, the project would also inject significant investment into energy infrastructure with flow effects for other industries.

The economic benefits during construction of the project at national, State and regional level are summarised below:

	$9.4 billion in direct and indirect gross output or business turnover (nation-wide) $8.9 billion in direct and indirect gross output or business turnover (State wide) $6.3 billion in direct and indirect gross output or business turnover (regional)
	$4.3 billion in direct and indirect GVA (nation-wide) $4.0 billion in direct and indirect GVA (State wide) $2.8 billion in direct and indirect GVA (regional)
	$2.2 billion in direct and indirect remuneration (nation-wide) $2.1 billion in direct and indirect remuneration (State wide) $1.5 billion in direct and indirect remuneration (regional)
	27,294 direct and indirect job years (nation-wide) 25,817 direct and indirect job years (State wide) 17,462 direct and indirect job years (regional)

The project's total contribution to the regional economy would be influenced by the extent to which households and businesses can provide the factors of production (such as labour, capital and materials) to support the construction and operation of the project. Transgrid has and would continue to consult with landowners, community members, local councils and interest groups to identify methods to minimise project impacts, where possible, and maximise benefits for the region.

Several major infrastructure projects are scheduled for construction in the study area in the coming years which may impact the availability of short-term rental accommodation. As part of the project Transgrid would build a fully serviced temporary accommodation facility in Tumbarumba to house up to 200 workers to ease the demand on short-term rental accommodation. Transgrid will prepare a Worker Accommodation Strategy prior to the commencement of construction. Councils and other relevant stakeholders will be consulted to identify additional potential options for temporary worker accommodation during construction. The strategy will aim to maximise benefits for the communities within the study area and minimise potential social and economic impacts.

As a worst case scenario, based on the indicative concept design, it is likely that the project would result in approximately 391.2 hectares of forestry land during construction and 351.8 hectares of forestry land during operation being permanently removed from production as a result of the project. This would equate to approximately 0.2 per cent of the total area of forestry land use within the directly impacted LGAs. In terms of any permanent losses in private plantation, owners would be compensated under just terms under the *Land Acquisition (Just Terms Compensation) Act 1991* for any loss of forest. Overall, the economic impact on forestry associated with the project is considered insignificant.

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APPENDIX A : GUIDELINES

The NSW Government are yet to develop a formal guideline or framework for undertaking economic impact assessments. However, the *NSW Government Guidelines for Economic Appraisals (2007)* notes that economic impact assessments typically use Input-Output (I-O) Multiplier analysis of computable generated equilibrium (CGE) models and the key objective of an economic impact assessment is to "estimate changes to economic activity associated with a development." The use of I-O analysis and CGE modelling to estimate economic impacts as part of this report is also recognised in the NSW Government Guide to Cost Benefit Analysis (The Treasury, 2017). The Guideline for Economic Appraisals also observes that economic impact assessments in NSW "do not relate the expected benefits to the costs involved" as per a cost benefit analysis.

Given a guideline for economic impact assessments has not been established in NSW, the Queensland *Economic Impact Assessment Guideline 2017* (QLD Economic Impact Assessment Guideline 2017) was considered for the purpose of this report. The key objectives and requirements of an economic impact assessment identified in the QLD Economic Impact Assessment Guideline 2017 are documented below:

- the primary objective as of an economic impact assessment as defined under *the State Development and Public Works Organisation Act 1971* is to "identify the key economic impacts of the project—both positive and negative". This may include an estimate of the economic benefits and costs of a project.
- an economic impact assessment:
    - must include a description of the project
    - must define the 'base case' including the local and regional economic environment without the project
    - must estimate the project's economic impacts and identify measures to manage any negative impacts and capture the economic opportunities generated by the project
    - measure the project's impact against the base case
    - use standardised methodologies and information
    - make all assumptions transparent, and propose targeted impact management measures
    - must meet the requirements of the Terms of Reference and be consistent with the social impact assessment and other elements of the Environmental Impact Statement (EIS)
    - must be developed in consultation with key stakeholders such as local governments, industry bodies and local businesses
    - must express monetary values in Australian dollars adjusted to a common date
    - must consider cumulative impacts of other developments in the region, where feasible.

The QLD Economic Impact Assessment Guideline 2017 also notes that there are typically "two separate types of assessments used in an economic impact assessment including:

- Regional impact analysis (RIA), which is used to describe the size and nature of the effects on local, regional and State economies.
- Cost–benefit analysis (CBA), which is used to identify the costs and benefits of the project. While many of the metrics are common to both assessments, the rationale, tools and outputs are different."

HillPDA consider the core requirements for economic impact assessment under the QLD Economic Impact Assessment Guideline 2017 to be reasonable and for this reason have closely followed these prerequisites in light of an absence of a formal NSW guideline. To meet the objective of this study (and given a CBA is not required) for the purposes of this study an Input Output Multiplier analysis has been undertaken which closely aligns to both the NSW Treasury Guideline and the RIA approach defined in the QLD Economic Impact Assessment Guideline 2017.

APPENDIX B : ECONOMIC BASELINE ANALYSIS BY LGA

Wagga Wagga City LGA

Wagga Wagga City LGA Gross Regional Product

As shown in Table B 1, Wagga Wagga City LGA's GRP was $4.2 billion in the year ending June 2021, up 1.9 per cent from the previous year ($4.1 billion as at June 2020) and broadly in line with the five year average ($4.2 billion). Local resident GRP outpaced local industry GRP from 2019, suggesting a leakage of economic productivity to other areas beyond the LGA.

Table B 1: Wagga Wagga City LGA's GRP measures

Year ending June	Headline GRP* $m	% change from previous year	Local industry GRP** $m	Local residents GRP*** $m	Local industry to residents ratio
2021	4,202	1.9	3,481	3,602	0.97
2020	4,121	-2	3,372	3,491	0.97
2019	4,205	-1.4	3,333	3,361	0.99
2018	4,264	-0.4	3,341	3,272	1.02
2017	4,281	1.5	3,370	3,296	1.02
5 year average	4,215	-	3,379	3,404	

* Headline GRP is the sum of all industries' estimated value added, plus a factor for ownership of dwellings. The value of accommodation is a part of the economy, but it is not part of any industry, so it is included separately. Ownership of dwellings includes actual rents received by landlords, and imputed rents representing the ongoing value of owner-occupied housing..

** Local Industry GRP shows the value of the local economy, generated by the local workers in the LGA regardless of where they live, after taxes and dividends leave the area

*** Local Resident GRP refers to the economic output of the residents of the area regardless of where they work (ie reflects the income received by people that live in the LGA).

Source: Economy.id.com.au, Wagga Wagga Economic Profile

Wagga Wagga City LGA output

The table below outlines the output by industry for the Wagga Wagga City LGA. Manufacturing ($1.1 billion or 13.5 per cent), Public administration and safety ($1.0 billion or 13.2 per cent) and Construction ($990.3 million or 12.7 per cent) were the three largest industries, with these industries combined accounting for $3.1 billion or 39.4 per cent of the total industry output in the Wagga Wagga City LGA. Output levels of industries manufacturing and Public administration and safety were well above the Regional NSW average.

In addition to the above, Electrical, gas, water and waste services ($208 million) represented 2.7 per cent of the total output (or $7.9 billion).

Table B 2: Wagga Wagga City LGA's Output by industry sector

Industry	2020/2021			2015/2016			2015/16–-2020/21
	$m	%.	Regional NSW	$m	%.	Regional NSW	
Agriculture, forestry and fishing	482.6	6.2	8.4	476.4	6.3	7.7	6.2
Mining	12.5	0.2	9.2	10.5	0.1	12.8	2.0
Manufacturing	1,060.2	13.5	11.6	963.2	12.8	10.9	97.0
Electricity, gas, water and waste	208.0	2.7	4.1	236.7	3.1	4.1	-28.6
Construction	990.3	12.7	14.4	1,019.6	13.5	12.3	-29.3
Wholesale trade	304.7	3.9	2.5	258.9	3.4	2.4	45.8
Retail trade	354.2	4.5	4.3	349.3	4.6	4.2	4.9
Accommodation and food services	288.1	3.7	3.2	233.7	3.1	3.7	54.3
Transport, postal and warehousing	281.9	3.6	4.1	413.2	5.5	4.6	-131.2
Information media and telecommunications	117.9	1.5	1.1	96.6	1.3	0.9	21.3
Financial and insurance services	308.5	3.9	3.1	234.1	3.1	3.0	74.4
Rental, hiring and real estate	527	6.7	7.2	564.7	7.5	8.1	-37.7
Professional, scientific and technical services	269.6	3.4	4.3	265.5	3.5	4.2	4.1
Administrative and support services	154.7	2	2.3	173.8	2.3	2.9	-19.1
Public administration and safety	1,035.0	13.2	5	967.2	12.8	4.7	67.8
Education and training	526.6	6.7	4.5	513.2	6.8	4.4	13.3
Health care and social assistance	682.9	8.7	7.4	545.6	7.2	6.1	137.3
Arts and recreation services	29.3	0.4	0.7	41.9	0.6	0.9	-12.7
Other services	193.9	2.5	2.5	179.4	2.4	2.3	14.5
Total industries	7,827.9	100.0	100.0	7,543.6	100.0	100.0	284.2

Source: National Institute of Economic and Industry Research (NIEIR) ©2021. Compiled and presented in economy.id by.id (informed decisions), Wagga Wagga Economic Profile

Wagga Wagga City LGA value added

Value added by industry is an indicator of business productivity and demonstrates how productive each industry sector is at adding value to its inputs. The table below outlines the value added by industry for the Wagga Wagga City LGA and reveals Public administration and safety ($583.6 million or 16.8 per cent), Health care and social assistance ($456.8 million or 13.1 per cent) and Construction ($316.7 million or 9.1 per cent) were the three most productive industries, with these industries combined accounting for $1.4 billion or 39 per cent of the total value added by all industries in the Wagga Wagga City LGA. The level of value added across Construction industry has fallen since 2015/16 and more recently has fallen below the Regional NSW average.

Similarly, Wagga Wagga City LGA's Electrical, gas, water and waste services industry witnessed a fall in productivity over this same period, with the level of value added falling from $92.8 million (or accounting 2.7 per cent of the LGA's value added) to $80.6 million in 2020/21 (or 2.3 per cent which is also below the NSW regional average).

Table B 3: Wagga Wagga City LGA's value added by industry sector

Industry	2020/2021			2015/2016			2015/16–-2020/21
	$m	%.	Regional NSW	$m	%.	Regional NSW	
Agriculture, forestry and fishing	180.3	5.2	7.5	205.4	5.9	7.8	-25.1
Mining	4.9	0.1	8.8	4.1	0.1	10.9	0.8
Manufacturing	274.2	7.9	7.0	270.7	7.8	7.0	3.4
Electricity, gas, water and waste	80.6	2.3	3.8	92.8	2.7	3.8	-12.2
Construction	316.7	9.1	11	343.5	9.8	9.8	-26.8
Wholesale trade	155.8	4.5	3	137	3.9	2.9	18.8
Retail trade	212.1	6.1	6	213.8	6.1	5.9	-1.7
Accommodation and food services	123.6	3.6	3.3	105.3	3	3.8	18.3
Transport, postal and warehousing	122.2	3.5	4.2	198.6	5.7	5.2	-76.4
Information media and telecom.	44.3	1.3	0.9	45.1	1.3	0.9	-0.7
Financial and insurance services	175.1	5	3.9	142.1	4.1	3.9	33
Rental, hiring and real estate	96.0	2.8	3.1	98	2.8	3.2	-1.9
Professional, scientific and technical services	133.5	3.8	5.1	125.9	3.6	4.6	7.6
Administrative and support services	89.0	2.6	3.2	97.0	2.8	3.7	-7.9
Public administration and safety	583.6	16.8	6.9	593.2	17	6.6	-9.6
Education and training	340.2	9.8	7.3	355.6	10.2	7.2	-15.4
Health care and social assistance	456.8	13.1	11.7	366.2	10.5	9.5	90.6
Arts and recreation services	9.6	0.3	0.6	15.0	0.4	0.7	-5.4
Other services	81.3	2.3	2.5	83.5	2.4	2.4	-2.3
Total industries	3,479.9	100.0	100.0	3,492.9	100.0	100.0	-13

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Wagga Wagga Economic Profile

Wagga Wagga City LGA employment by industry sector

The table below compares employment levels between industries in the Wagga Wagga City LGA. Industries Health care and social assistance (6,312 workers or 18.5 per cent), Public administration and safety (3,828 workers or 11.2 per cent) and Education and training (3,623 workers or 10.6 per cent) were the three largest employers in the Wagga Wagga City LGA, with these industries supporting 13,763 jobs in 2021 in total or accounted for 40.3 per cent of the local workers in the Wagga Wagga City LGA. The total number of workers across all industries in the Wagga Wagga City LGA increased by 3,451 workers over the five years to 2021, largely driven by job growth in Health care and social assistance. The number of workers in the Agricultural, forestry and fishing industry also increased over this period (+134 workers), however proportionately remains below the Regional NSW average.

Table B 4: Wagga Wagga City LGA's Employment (Total) by industry sector

Industry	2021			2016			2016–- 2021
	No.	%.	Regional NSW	No.	%.	Regional NSW	
Agriculture, forestry and fishing	1,246	3.7	5.4	1,112	3.6	6	134
Mining	63	0.2	2.5	24	0.1	2.4	39
Manufacturing	1,940	5.7	5.9	2,016	6.6	6.2	-76
Electricity, gas, water and waste	426	1.3	1.3	358	1.2	1.3	68
Construction	2,483	7.3	8	2,019	6.6	7.1	464
Wholesale trade	822	2.4	1.9	801	2.6	2	21
Retail trade	3,356	9.9	10	3,375	11	11	-19
Accommodation and food services	2,299	6.8	8.3	2,175	7.1	8.6	124
Transport, postal and warehousing	1,232	3.6	3.6	1,195	3.9	3.8	37
Information media and telecommunications.	258	0.8	0.6	295	1	0.8	-37
Financial and insurance services	502	1.5	1.8	557	1.8	2	-55
Rental, hiring and real estate	340	1	1.3	363	1.2	1.4	-23
Professional, scientific and technical services	1,379	4.1	4.5	1,200	3.9	4.4	179
Administrative and support services	928	2.7	2.8	759	2.5	2.9	169
Public administration and safety	3,828	11.2	6.6	3,632	11.9	6.7	196
Education and training	3,623	10.6	9.6	3,198	10.5	9.3	425
Health care and social assistance	6,312	18.5	16.9	5,009	16.4	15.1	1,303
Arts and recreation services	254	0.7	1.2	273	0.9	1.2	-19
Other services	1,464	4.3	3.9	1,212	4	4	252
Industry not classified	1,296	3.8	3.8	1,024	3.3	3.8	272
Total industries	34,048	100	100	30,597	100	100	3,451

Source: ABS, Census of Population and Housing 2016 and 2021. Compiled and presented in economy.id by.id (informed decisions), Wagga Wagga Economic Profile

Wagga Wagga City LGA's jobs to worker ratio

A key goal of economic development is often to promote self-employment containment, which supports a more socially and environmentally sustainable community.

Employment capacity considers whether a defined region, and in this case the Wagga Wagga City LGA, could theoretically provide jobs for all its residents if they were to choose to work locally.

Employment capacity equates to total number of local jobs in an industry, divided by the number of local residents employed (anywhere) in that industry. A figure over 1.0 indicates that there are more jobs than residents employed in that industry, whilst below 1.0 means there are more residents employed than jobs in that sector.

As shown in Table B 5, the jobs to residents ratio for the Wagga Wagga City LGA in 2020/21 was 0.98, indicating that there were less jobs than resident workers. Moreover, Electricity, gas, water and waste services had the second lowest jobs to worker ratio at 0.73.

Table B 5: Wagga Wagga City LGA's employment capacity by industry

Industry	2020/2021			2015/2016		
	Local jobs	Employed residents	Ratio of jobs to residents	Local jobs	Employed residents	Ratio of jobs to residents
Agriculture, forestry and fishing	1,207	1,203	1.00	1,603	1,736	0.92
Mining	21	38	0.56	28	66	0.43
Manufacturing	2,748	2,318	1.19	2,365	2,378	0.99
Electricity, gas, water and waste	333	454	0.73	348	350	0.99
Construction	3,406	3,318	1.03	3,364	3,369	1
Wholesale trade	860	1,177	0.73	904	864	1.05
Retail trade	3,408	3,326	1.02	3,685	3,580	1.03
Accommodation and food services	2,880	3,064	0.94	2,271	2,322	0.98
Transport, postal and warehousing	1,221	1,331	0.92	1,513	1,533	0.99
Information media and telecommunications	356	350	1.02	458	482	0.95
Financial and insurance services	747	845	0.88	569	578	0.98
Rental, hiring and real estate	369	464	0.8	397	389	1.02
Professional, scientific and technical services	1,329	1,055	1.26	1,311	1,316	1
Administrative and support services	846	1,029	0.82	930	911	1.02
Public administration and safety	3,775	4,241	0.89	3,787	3,290	1.15
Education and training	3,309	3,623	0.91	3,438	3,473	0.99
Health care and social assistance	5,798	5,354	1.08	5,495	5,176	1.06
Arts and recreation services	268	335	0.8	304	295	1.03
Other services	1,278	1,171	1.09	1,348	1,295	1.04
Total industries	**34,160**	**34,694**	**0.98**	**34,116**	**33,403**	**1.02**

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Wagga Wagga Economic Profile

In addition to employment capacity, self-containment measures the proportion of resident workers who are employed within the LGA or defined region. It also indicates the propensity of residents to seek employment beyond the LGA or region in which they live. Over the period from 2016 to 2021 the percentage of resident workers employed locally fell by 0.2 per cent across all industries, including in the Electricity, gas, water and waste services industry 94.9 per cent). Notwithstanding this, the percentage of resident workers increased in the Construction industry to almost 80 per cent (+1.5%).

Location quotient analysis

The location quotient (LQ) is used to assess what the main industries are in an area, relative to the wider region. Location quotient shows the percentage of the local economy characteristic (eg. employment, value add) in a particular industry divided by the percentage of the wider area (in this case Regional NSW) that this industry makes up.

A LQ score of:

- one indicates that the industry is exactly as prevalent as in the wider region
- greater than 1.2 indicates a significant specialisation of the industry in the local area, while a number over two is considered a major specialisation (ie the higher the number the greater the specialisation)
- between 0.8 and 1.2 indicates the industry is broadly similar in importance in the local area compared to the comparison region and could be seen as representative
- below 0.8 indicates an industry which is more important in the region than the local area (ie potential may represent an economic weakness or opportunity for growth).

Table B 6: Wagga Wagga City LGA's location quotient–- employment

Industry	2020/2021			2015/2016			2015/16–-2020/21
	%.	Regional NSW%	Location Quotient Regional NSW	%.	Regional NSW%	Location Quotient Regional NSW	
Agriculture, forestry and fishing	3.5	6.2	0.57	4.7	6.4	0.74	-0.23
Mining	0.1	3	0.02	0.1	2.7	0.03	-0.33
Manufacturing	8	6.9	1.16	6.9	6.8	1.02	0.14
Electricity, gas, water and waste	1	1.4	0.67	1	1.4	0.73	-0.08
Construction	10	10.4	0.96	9.9	8.8	1.13	-0.15
Wholesale trade	2.5	1.9	1.36	2.7	2.2	1.22	0.11
Retail trade	10	10.3	0.96	10.8	11	0.98	-0.02
Accommodation and food services	8.4	7.6	1.11	6.7	8.4	0.79	0.41
Transport, postal and warehousing	3.6	3.8	0.93	4.4	4.1	1.08	-0.14
Information media and telecommunications	1	0.8	1.36	1.3	0.9	1.56	-0.13
Financial and insurance services	2.2	1.8	1.18	1.7	1.9	0.9	0.32
Rental, hiring and real estate	1.1	1.2	0.89	1.2	1.4	0.82	0.09
Professional, scientific and technical services	3.9	4.6	0.85	3.8	4.4	0.87	-0.02
Administrative and support services	2.5	2.9	0.87	2.7	3.3	0.82	0.06
Public administration and safety	11	6.3	1.75	11.1	6.4	1.75	0
Education and training	9.7	9.4	1.03	10.1	9.5	1.07	-0.03
Health care and social assistance	17	15.8	1.07	16.1	15	1.08	0

Industry	2020/2021			2015/2016			2015/16–-2020/21
	%.	Regional NSW%	Location Quotient Regional NSW	%.	Regional NSW%	Location Quotient Regional NSW	
Arts and recreation services	0.8	1.3	0.61	0.9	1.5	0.6	0.03
Other services	3.7	4.3	0.87	4	4.1	0.96	-0.1
Total industries	100	100	1	100	100	1	0

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Wagga Wagga Economic Profile

An analysis of employment in the Wagga Wagga City LGA (and shown in Table B 6) reveals that in 2020/21 the three industries with the highest LQ relative to Regional NSW were Public administration and safety (1.75), Wholesale trade (1.36) and Information, media and telecommunications (1.36). Analysing the changes in LQ over time can reveal emerging or declining industry specialisations. A review of the largest changes in the employment LQ over the five years to 2019/20 in the Wagga Wagga City LGA, identified Electricity, gas, water and waste services as an emerging industry. Over the five years to 2020/21, however, the industry's LQ has declined to 0.67.

Cootamundra-Gundagai Regional LGA

Note that economic profile and industry analysis for Cootamundra-Gundagai Regional has not been updated in EconomyID, with limited data Census data published to date. For this reason, HillPDA has adopted weighted averages from the surrounding LGAs where reasonable.

Cootamundra-Gundagai Regional LGA Gross Regional Product

As shown in Table B 7, Cootamundra-Gundagai Regional LGA's GRP was $0.54 billion in the year ending June 2021, down 3.8 per cent from 2016 ($0.52 billion as at June 2016) and remains below historical levels.

Table B 7: Cootamundra–Gundagai Regional LGA GRP

Year ending June	GRP $m	% change
2021	504	-3.6%
2016	523	-5.4%
2011	553	1.1%
2006	547	

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Cootamundra-Gundagai Economic Profile

Cootamundra-Gundagai Regional LGA value added

HillPDA estimates the total value added across all industries to be in the order of $425 million[10].

Cootamundra-Gundagai Regional (census) employment by industry sector

As shown in Table B 7, the three largest industries in the LGA in 2021 in terms of number of workers were Agriculture, forestry and fishing (663 people or 16.1 per cent), Health care and social assistance (554 people or 13.4 per cent) and Retail trade (395 people or 8.0 per cent). These three industries employed 1,612 people in total or 39 per cent of the local workers. The total number of jobs all industries in the Cootamundra-Gundagai Regional LGA fell very slightly from 4,137 in 2016 to 4,129 in 2021 (ie – 8 local workers). There was a sharp decline in Manufacturing from 540 to 331 (-39%) and in Accommodation and food services from 348 to 284 (-18%) and a significant increase in Health care and social assistance from 455 to 554 (22%).

[10] Assumes 1) 4,239 jobs across all industries in 2021 as sourced from Economy.ID (2021) 2) An average value added of ~$100,363 / worker across all industries. This is based on a weighted average of value added / worker by industry across LGAs Wagga Wagga, Hilltops and Goulburn Mulwaree, Snowy Valley, Upper Lachlan Shire and Yass Valley as sourced from Economy.ID.

Table B 8: Cootamundra–Gundagai Regional LGA's Employment (Census) by industry sector

Industry	2021			2016			Change 2016-21
	No.	%.	Regional NSW	No.	%.	Regional NSW	
Agriculture, forestry and fishing	663	16.1	5.4	634	15.3	6.0	29
Mining	12	0.3	2.5	11	0.3	2.4	1
Manufacturing	331	8.0	5.9	540	13.1	6.2	-209
Electricity, gas, water and waste	39	0.9	1.3	45	1.1	1.3	-6
Construction	261	6.3	8.0	189	4.6	7.1	72
Wholesale trade	83	2.0	1.9	86	2.1	2.0	-3
Retail trade	395	9.6	10.0	385	9.3	11.0	10
Accommodation and food services	284	6.9	8.3	348	8.4	8.6	-64
Transport, postal and warehousing	248	6.0	3.6	239	5.8	3.8	9
Information media and telecom.	16	0.4	0.6	11	0.3	0.8	5
Financial and Insurance Services	49	1.2	1.8	38	0.9	2.0	11
Rental, hiring and real estate	26	0.6	1.3	26	0.6	1.4	0
Professional, scientific and technical services	165	4.0	4.5	169	4.1	4.4	-4
Administrative and support services	100	2.4	2.8	91	2.2	2.9	9
Public administration and safety	209	5.1	6.6	212	5.1	6.7	-3
Education and training	353	8.5	9.6	319	7.7	9.3	34
Health care and social assistance	554	13.4	16.9	455	11.0	15.1	99
Arts and recreation services	34	0.8	1.2	34	0.8	1.2	0
Other services	124	3.0	3.9	136	3.3	4.0	-12
Industry not classified	172	4.2	3.8	169	4.1	3.8	3
Total persons	4,129	100.0	100.0	4,137	100.0	100.0	-8

Source: ABS Census Working Population Profiles

Hilltops LGA

Hilltops LGA Gross Regional Product

As shown in Table B 9, Hilltops LGA's Gross Regional Product (GRP) was $978 million in the year ending June 2021, up 6.4 per cent from the previous year ($919 million as at June 2020) and slightly below the five year average ($984 million). Local resident GRP outpaced local industry GRP from 2017, suggesting a leakage of economic productivity to other areas beyond the LGA.

Table B 9: Hilltops LGA's GRP measures

Year ending June	Headline GRP* $m	% change from previous year	Local industry GRP** $m	Local residents GRP*** $m	Local industry to residents ratio
2021	978	6.4	811	882	0.92
2020	919	-4.8	780	871	0.9
2019	966	-5.6	822	891	0.92
2018	1,023	-1.1	858	909	0.94
2017	1,034	5.6	843	885	0.95
5 year average	984	-	823	888	

* Headline GRP is the sum of all industries' estimated value added, plus a factor for ownership of dwellings. The value of accommodation is a part of the economy, but it is not part of any industry, so it is included separately. Ownership of dwellings includes actual rents received by landlords, and imputed rents representing the ongoing value of owner-occupied housing..

** Local Industry GRP shows the value of the local economy, generated by the local workers in the LGA regardless of where they live, after taxes and dividends leave the area

*** Local Resident GRP refers to the economic output of the residents of the area regardless of where they work (ie reflects the income received by people in the City).

Source: Economy.id.com.au, Hilltops Economic Profile

Hilltops LGA output

The table below outlines the output by industry for the Hilltops LGA. Agriculture, forestry and fishing ($579.4 million or 30.8 per cent), Construction ($190.3 million or 10.1 per cent) and Mining ($150.6 million or 8 per cent) were the three largest industries, with these industries combined accounting for $0.9 billion or 48.9 per cent of the total industry output in the Hilltops LGA. Output levels for Agricultural, forestry and fishing were well above the Regional NSW average.

In addition to the above, Electrical, gas, water and waste services ($55.6 million) represented 3 per cent of the total output (or $1.9 billion).

Table B 10: Hilltops LGA's Output by industry sector

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	$m	%.	Regional NSW	$m	%.	Regional NSW	
Agriculture, forestry and fishing	579.4	30.8	8.4	563.3	31.9	7.7	16.0
Mining	150.6	8.0	9.2	41.9	2.4	12.8	108.7
Manufacturing	140.4	7.5	11.6	141.7	8.0	10.9	-1.3
Electricity, gas, water and waste	55.6	3.0	4.1	43.3	2.5	4.1	12.3
Construction	190.3	10.1	14.4	164.7	9.3	12.3	25.6
Wholesale trade	72.0	3.8	2.5	68.5	3.9	2.4	3.5
Retail trade	92.1	4.9	4.3	107.8	6.1	4.2	-15.8
Accommodation and food services	45.3	2.4	3.2	56.9	3.2	3.7	-11.6
Transport, postal and warehousing	73.6	3.9	4.1	86.8	4.9	4.6	-13.3
Information media and telecom.	5.5	0.3	1.1	5.7	0.3	0.9	-0.1
Financial and Insurance Services	55.6	3	3.1	50	2.8	3.0	5.7
Rental, hiring and real estate	70.6	3.8	7.2	100.1	5.7	8.1	-29.5
Professional, scientific and technical services	51.0	2.7	4.3	43	2.4	4.2	8.0
Administrative and support services	23.1	1.2	2.3	30	1.7	2.9	-6.9
Public administration and safety	50.4	2.7	5	41.3	2.3	4.7	9.2
Education and training	68.1	3.6	4.5	64.3	3.6	4.4	3.8
Health care and social assistance	100.9	5.4	7.4	101.3	5.7	6.1	-0.4
Arts and recreation services	6.4	0.3	0.7	7.9	0.5	0.9	-1.5
Other services	47.4	2.5	2.5	45.3	2.6	2.3	2.1
Total industries	**1,878.3**	**100.0**	100.0	**1,763.7**	**100.0**	**100.0**	**114.6**

Source: National Institute of Economic and Industry Research (NIEIR) ©2021. Compiled and presented in economy.id by.id (informed decisions), Hilltops Economic Profile

Hilltops LGA value added

The table below outlines the value added by industry for the Hilltops LGA and demonstrates that Agriculture, forestry and fishing ($223.4 million or 27.4 per cent), Health care and social assistance ($69.2 million or 8.5 per cent) and Mining ($67.5 million or 8.3 per cent) were the three most productive industries, with these industries combined accounting for $360.1 million or 44.2 per cent of the total value added by all industries in the Hilltops LGA. The level of value added for the Electrical, gas, water and waste services industry has increased over the five years to 2021, with the level of value added increasing from $17 million in 2015/16 (or accounting 2.1 per cent of the LGA's value added) to $21.6 million in 2020/21 (or 2.7 per cent which is also below the NSW regional average).

Table B 11: Hilltops LGA's value added by industry sector

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	$m	%.	Regional NSW	$m	%.	Regional NSW	
Agriculture, forestry and fishing	223.4	27.4	7.5	250.7	30.9	7.8	-27.3
Mining	67.5	8.3	8.8	19.1	2.4	10.9	48.4
Manufacturing	37.4	4.6	7.0	41.2	5.1	7.0	-3.8
Electricity, gas, water and waste	21.6	2.7	3.8	17.0	2.1	3.8	4.6
Construction	61.7	7.6	11.0	56.5	7.0	9.8	5.2
Wholesale trade	35.2	4.3	3.0	36.3	4.5	2.9	-1.1
Retail trade	55.1	6.7	6.0	66	8.1	5.9	-10.9
Accommodation and food services	20.0	2.5	3.3	25.6	3.2	3.8	-5.6
Transport, postal and warehousing	32.0	3.9	4.2	43.1	5.3	5.2	-11.1
Information media and telecom.	2.0	0.2	0.9	2.5	0.3	0.9	-0.5
Financial and Insurance Services	33.3	4.1	3.9	30.7	3.8	3.9	2.5
Rental, hiring and real estate	12.9	1.6	3.1	17.3	2.1	3.2	-4.4
Professional, scientific and technical services	25.3	3.1	5.1	20.3	2.5	4.6	5
Administrative and support services	13.6	1.7	3.2	16.9	2.1	3.7	-3.3
Public administration and safety	30.3	3.7	6.9	25.4	3.1	6.6	4.9
Education and training	52.5	6.4	7.3	47.1	5.8	7.2	5.5
Health care and social assistance	69.2	8.5	11.7	70.0	8.6	9.5	-0.8
Arts and recreation services	2.0	0.2	0.6	2.7	0.3	0.7	-0.7
Other services	21.1	2.6	2.5	23.1	2.9	2.4	-2.1
Total industries	816.1	100.0	100.0	811.5	100.0	100.0	4.6

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Hilltops Economic Profile

Hilltops LGA employment by industry sector

The table below compares the employment levels between industries in the Hilltops LGA. Agriculture, forestry and fishing (1,511 workers or 20 per cent), Health care and social assistance (894 workers or 12 per cent) and retail trade (781 workers or 10.5 per cent) were the three largest employers in the Hilltops LGA, with these industries supporting 3,186 jobs in 2021 in total or accounted for 42.8 per cent of the local workers in the Hilltops LGA. The total number of workers across all industries in the Hilltops LGA increased by 497 over the five years to 2021 (increasing to 7,460 in 2021). Despite this overall increase, the number of workers employed in Agriculture, forestry and fishing declined over this same period by 17 workers. The industry's representation remained well above the Regional NSW average, highlighting the industry's importance in supporting job growth in the LGA.

Table B 12: Hilltops LGA's Employment (total) by industry sector

Industry	2021			2016			2016 - 2021
	No.	%.	Regional NSW	No.	%.	Regional NSW	
Agriculture, forestry and fishing	1,511	20.3	5.4	1,528	21.9	6	-17
Mining	72	1	2.5	70	1	2.4	2
Manufacturing	367	4.9	5.9	332	4.8	6.2	35
Electricity, gas, water and waste	69	0.9	1.3	62	0.9	1.3	7
Construction	526	7.1	8	432	6.2	7.1	94
Wholesale trade	156	2.1	1.9	181	2.6	2	-25
Retail trade	781	10.5	10	799	11.5	11	-18
Accommodation and food services	508	6.8	8.3	397	5.7	8.6	111
Transport, postal and warehousing	260	3.5	3.6	278	4	3.8	-18
Information media and telecom.	27	0.4	0.6	36	0.5	0.8	-9
Financial and Insurance Services	159	2.1	1.8	146	2.1	2	13
Rental, hiring and real estate	54	0.7	1.3	61	0.9	1.4	-7
Professional, scientific and technical services	219	2.9	4.5	212	3	4.4	7
Administrative and support services	163	2.2	2.8	133	1.9	2.9	30
Public administration and safety	363	4.9	6.6	328	4.7	6.7	35
Education and training	636	8.5	9.6	536	7.7	9.3	100
Health care and social assistance	894	12	16.9	800	11.5	15.1	94
Arts and recreation services	42	0.6	1.2	46	0.7	1.2	-4
Other services	295	4	3.9	273	3.9	4	22
Industry not classified	361	4.8	3.8	313	4.5	3.8	48
Total industries	7,460	100	100	6,963	100	100	497

Source: ABS, Census of Population and Housing 2016 and 2021. Compiled and presented in economy.id by.id (informed decisions), Hilltops Economic Profile

Hilltops LGA's jobs to worker ratio

As shown in Table B 13, the jobs to residents ratio for the Hilltops LGA in 2020/21 was 0.89, indicating that there were less jobs than resident workers.

Table B 13: Hilltops LGA's employment capacity by industry

Industry	2020/2021			2015/2016		
	Local jobs	Employed residents	Ratio of jobs to residents	Local jobs	Employed residents	Ratio of jobs to residents
Agriculture, forestry and fishing	1,544	1,411	1.09	1,873	1,811	1.03
Mining	236	264	0.89	106	115	0.92
Manufacturing	380	389	0.98	444	530	0.84
Electricity, gas, water and waste	95	73	1.29	73	92	0.79
Construction	676	739	0.91	554	622	0.89
Wholesale trade	175	200	0.88	237	250	0.95
Retail trade	769	1,017	0.76	985	1,016	0.97
Accommodation and food services	376	397	0.95	454	488	0.93
Transport, postal and warehousing	286	384	0.74	348	378	0.92
Information media and telecom.	22	37	0.59	31	42	0.74
Financial and Insurance Services	147	103	1.42	148	154	0.96
Rental, hiring and real estate	62	45	1.38	94	100	0.94
Professional, scientific and technical services	224	298	0.75	242	274	0.88
Administrative and support services	161	213	0.76	191	209	0.91
Public administration and safety	373	601	0.62	347	425	0.82
Education and training	667	731	0.91	668	686	0.97
Health care and social assistance	809	969	0.84	945	984	0.96
Arts and recreation services	42	42	1.00	60	72	0.83
Other services	323	343	0.94	320	333	0.96
Total industries	**7,367**	**8,256**	**0.89**	**8,121**	**8,581**	**0.95**

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Hilltops Economic Profile

In terms of self-containment over the period from 2016 to 2021 the percentage of resident workers employed locally fell by 1.3 per cent across all industries. Despite the Electricity, gas, water and waste services industry (6.2 per cent) and the Construction industry (2.5 per cent).

Location quotient analysis

Based on the LQ analysis, the Agriculture, forestry and fishing industry was identified as major specialisation in the LGA in terms of employment (ie with a LQ of 3.36). As such this is a key industry for the local economy, with opportunities to capitalise on this strength.

Table B 14:: Hilltops LGA's location quotient - employment

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	%.	Regional NSW%	Location Quotient Regional NSW	%.	Regional NSW%	Location Quotient Regional NSW	
Agriculture, forestry and fishing	21.0	6.2	3.36	23.1	6.4	3.62	-0.07
Mining	3.2	3	1.08	1.3	2.7	0.49	1.22
Manufacturing	5.2	6.9	0.74	5.5	6.8	0.8	-0.07
Electricity, gas, water and waste	1.3	1.4	0.89	0.9	1.4	0.65	0.37
Construction	9.2	10.4	0.88	6.8	8.8	0.78	0.13
Wholesale trade	2.4	1.9	1.28	2.9	2.2	1.34	-0.05
Retail trade	10.4	10.3	1.01	12.1	11	1.11	-0.09
Accommodation and food services	5.1	7.6	0.67	5.6	8.4	0.66	0.02
Transport, postal and warehousing	3.9	3.8	1.01	4.3	4.1	1.04	-0.03
Information media and telecom.	0.3	0.8	0.39	0.4	0.9	0.44	-0.12
Financial and Insurance Services	2.0	1.8	1.08	1.8	1.9	0.98	0.11
Rental, hiring and real estate	0.8	1.2	0.7	1.2	1.4	0.81	-0.14
Professional, scientific and technical services	3.0	4.6	0.66	3	4.4	0.67	-0.01
Administrative and support services	2.2	2.9	0.77	2.4	3.3	0.71	0.08
Public administration and safety	5.1	6.3	0.8	4.3	6.4	0.67	0.19
Education and training	9.1	9.4	0.96	8.2	9.5	0.87	0.11
Health care and social assistance	11	15.8	0.69	11.6	15	0.78	-0.11
Arts and recreation services	0.6	1.3	0.45	0.7	1.5	0.49	-0.09
Other services	4.4	4.3	1.02	3.9	4.1	0.96	0.06
Total industries	**100**	**100**	**1**	**100**	**100**	**1**	**0**

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Hilltops Economic Profile

Goulburn-Mulwaree LGA

Goulburn-Mulwaree LGA Gross Regional Product

As shown in the table below, Goulburn Mulwaree LGA's Gross Regional Product (GRP) was $1.7 billion in the year ending June 2021, up 3.4 per cent from the previous year ($1.7 billion as at June 2020) and above the five year average ($1.7 billion). Local resident GRP remained above local industry GRP since 2017, suggesting a leakage of economic productivity to other areas beyond the LGA.

Table B 15: Goulburn-Mulwaree LGA's GRP measures

Year ending June	Headline GRP* $m	% change from previous year	Local industry GRP** $m	Local residents GRP*** $m	Local industry to residents ratio
2021	1,735	3.4	1,468	1,547	0.95
2020	1,679	1.7	1,429	1,536	0.93
2019	1,651	0.5	1,422	1,505	0.94
2018	1,642	0.4	1,394	1,475	0.94
2017	1,636	4.7	1,363	1,440	0.95
5 year average	1,669		1,415	1,501	

* Headline GRP is the sum of all industries' estimated value added, plus a factor for ownership of dwellings. The value of accommodation is a part of the economy, but it is not part of any industry, so it is included separately. Ownership of dwellings includes actual rents received by landlords, and imputed rents representing the ongoing value of owner-occupied housing.

** Local Industry GRP shows the value of the local economy, generated by the local workers in the LGA regardless of where they live, after taxes and dividends leave the area

*** Local Resident GRP refers to the economic output of the residents of the area regardless of where they work (ie reflects the income received by people in the City).

Source: Economy.id.com.au, Goulburn Mulwaree Economic Profile

Goulburn-Mulwaree LGA output

The table below outlines the output by industry for the Goulburn-Mulwaree LGA. Construction ($615.1 million or 19.4 per cent), Manufacturing ($359.2 million or 11.3 per cent) and Public administration and safety ($297 million or 9.4 per cent) were the three largest industries, with these industries combined accounting for $1.3 billion or 40.1 per cent of the total industry output in the Goulburn-Mulwaree LGA. Output levels Construction and Public administration and safety were well above the NSW Regional average.

Table B 16: Goulburn-Mulwaree LGA's Output by industry sector

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	$m	%.	Regional NSW	$m	%.	Regional NSW	
Agriculture, forestry and fishing	186.9	5.9	8.4	146.8	5.3	7.7	40.1
Mining	88.1	2.8	9.2	67.3	2.4	12.8	20.8
Manufacturing	359.2	11.3	11.6	282.3	10.3	10.9	76.9
Electricity, gas, water and waste	67.7	2.1	4.1	82.2	3	4.1	-14.5
Construction	615.1	19.4	14.4	356.3	13	12.3	258.8
Wholesale trade	75.4	2.4	2.5	59.9	2.2	2.4	15.4
Retail trade	143.3	4.5	4.3	155.8	5.7	4.2	-12.5
Accommodation and food services	110.7	3.5	3.2	117.8	4.3	3.7	-7.1
Transport, postal and warehousing	239.6	7.5	4.1	214.2	7.8	4.6	25.3
Information media and telecom.	35.5	1.1	1.1	19.7	0.7	0.9	15.7
Financial and Insurance Services	65.2	2.1	3.1	63.5	2.3	3	1.7
Rental, hiring and real estate	216.8	6.8	7.2	295.1	10.7	8.1	-78.3
Professional, scientific and technical services	96	3	4.3	86.8	3.2	4.2	9.2
Administrative and support services	65.2	2.1	2.3	73.8	2.7	2.9	-8.6
Public administration and safety	297	9.4	5	280.8	10.2	4.7	16.2
Education and training	121.4	3.8	4.5	132.6	4.8	4.4	-11.2
Health care and social assistance	282.1	8.9	7.4	219.1	8	6.1	63
Arts and recreation services	19	0.6	0.7	24.8	0.9	0.9	-5.8
Other services	90.4	2.8	2.5	69.9	2.5	2.3	20.5
Total industries	**3,175**	**100**	**100**	**2,749**	**100**	**100**	**426**

Source: National Institute of Economic and Industry Research (NIEIR) ©2021. Compiled and presented in economy.id by.id (informed decisions), Goulburn Mulwaree Economic Profile

Goulburn-Mulwaree LGA value added

The table below outlines the value added by industry for the Goulburn-Mulwaree LGA and reveals Health care and social assistance ($189.7 million or 13.6 per cent), Public administration and safety ($183.9 million or 13.2 per cent) and Transport, postal and warehousing ($109.5 million or 7.9 per cent) were the three most productive industries, with these industries combined accounting for $483.1 million or 34.7 per cent of the total value added by all industries in the Goulburn-Mulwaree LGA.

Goulburn-Mulwaree LGA's Electrical, gas, water and waste services industry witnessed a fall in productivity over the five years to 2021, with the level of value added falling from $31.4 million in 2015/16 (or accounting 2.5 per cent of the LGA's value added) to $25.4 million in 2020/21 (or 1.8 per cent which is also below the Regional NSW average).

Table B 17: Goulburn-Mulwaree LGA's value added by industry sector

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	$m	%.	Regional NSW	$m	%.	Regional NSW	
Agriculture, forestry and fishing	70	5	7.5	64.8	5.1	7.8	5.2
Mining	35.4	2.5	8.8	30.6	2.4	10.9	4.9
Manufacturing	99.8	7.2	7	79	6.3	7	20.8
Electricity, gas, water and waste	25.4	1.8	3.8	31.4	2.5	3.8	-6
Construction	194.7	14	11	121.8	9.7	9.8	72.9
Wholesale trade	36.9	2.6	3	31.7	2.5	2.9	5.2
Retail trade	85.7	6.1	6	95.4	7.6	5.9	-9.7
Accommodation and food services	54.5	3.9	3.3	53.1	4.2	3.8	1.4
Transport, postal and warehousing	109.5	7.9	4.2	108.4	8.6	5.2	1.1
Information media and telecom.	12.6	0.9	0.9	8.4	0.7	0.9	4.2
Financial and Insurance Services	40.6	2.9	3.9	41.4	3.3	3.9	-0.7
Rental, hiring and real estate	39.8	2.9	3.1	52	4.1	3.2	-12.2
Professional, scientific and technical services	47.7	3.4	5.1	41.2	3.3	4.6	6.5
Administrative and support services	38.2	2.7	3.2	42.1	3.3	3.7	-3.8
Public administration and safety	183.9	13.2	6.9	175	13.9	6.6	8.9
Education and training	86.1	6.2	7.3	93.6	7.4	7.2	-7.5
Health care and social assistance	189.7	13.6	11.7	149.2	11.8	9.5	40.5
Arts and recreation services	6.2	0.4	0.6	8.8	0.7	0.7	-2.7
Other services	37.3	2.7	2.5	32.9	2.6	2.4	4.4
Total industries	1,394.10	100	100	1,260.80	100	100	133.4

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Goulburn Mulwaree Economic Profile

Goulburn-Mulwaree LGA employment by industry sector

The table below compares employment levels between industries in the Goulburn-Mulwaree LGA. Industries Health care and social assistance (2,307 workers or 17.8 per cent), Retail trade (1,388 workers or 10.7 per cent) and Public administration and safety (1,323 workers or 10.2 per cent) were the three largest employers in the Goulburn-Mulwaree LGA, with these industries supporting 5,018 jobs in 2021 in total or accounted for 38.7 per cent of the local workers in the Goulburn-Mulwaree LGA. The total number workers across all industries in the Goulburn-Mulwaree LGA increased by 1,425 over the five years to 2021, largely driven by an increase in Health care and social assistance and Construction workers.

Table B 18: Goulburn-Mulwaree LGA's Employment by industry sector

Industry	2021			2016			2016 - 2021
	No.	%.	Regional NSW	No.	%.	Regional NSW	
Agriculture, forestry and fishing	504	3.9	5	455	3.9	6	49
Mining	225	1.7	2.5	211	1.8	2.4	14
Manufacturing	821	6.3	6	643	5.6	6	178
Electricity, gas, water and waste	150	1.2	1.3	118	1	1.3	32
Construction	1,098	8.5	8	837	7.2	7	261
Wholesale trade	238	1.8	2	202	1.7	2	36
Retail trade	1,388	10.7	10	1,315	11.4	11	73
Accommodation and food services	987	7.6	8.3	982	8.5	8.6	5
Transport, postal and warehousing	579	4.5	3.6	534	4.6	3.8	45
Information media and telecom.	79	0.6	0.6	83	0.7	0.8	-4
Financial and Insurance Services	144	1.1	2	149	1.3	2	-5
Rental, hiring and real estate	142	1.1	1.3	157	1.4	1.4	-15
Professional, scientific and technical services	438	3.4	5	423	3.7	4	15
Administrative and support services	358	2.8	3	305	2.6	3	53
Public administration and safety	1,323	10.2	7	1,248	10.8	7	75
Education and training	1,104	8.5	9.6	958	8.3	9.3	146
Health care and social assistance	2,307	17.8	17	1,914	16.6	15	393
Arts and recreation services	133	1	1	144	1.2	1	-11
Other services	498	3.8	4	465	4	4	33
Industry not classified	466	3.6	3.8	421	3.6	3.8	45
Total industries	12,989	100	100	11,564	100	100	1,425

Source: ABS, Census of Population and Housing 2016 and 2021. Compiled and presented in economy.id by.id (informed decisions), Goulburn Mulwaree Economic Profile

Goulburn-Mulwaree LGA's jobs to worker ratio

As shown in Table B 19, the jobs to residents ratio for the Goulburn-Mulwaree LGA in 2020/21 was 0.91, indicating that there were less jobs than resident workers. Moreover, Electricity, gas, water and waste services had one of the lowest jobs to worker ratio at 0.74.

Table B 19: Goulburn-Mulwaree LGA's employment capacity by industry

Industry	2020/2021			2015/2016		
	Local jobs	Employed residents	Ratio of jobs to residents	Local jobs	Employed residents	Ratio of jobs to residents
Agriculture, forestry and fishing	524	385	1.36	559	531	1.05
Mining	370	354	1.05	236	224	1.06
Manufacturing	944	707	1.34	784	917	0.85
Electricity, gas, water and waste	115	157	0.74	133	180	0.74
Construction	1,701	1,910	0.89	1,058	1,179	0.9
Wholesale trade	209	198	1.06	249	284	0.88
Retail trade	1,349	1,703	0.79	1,579	1,629	0.97
Accommodation and food services	1,028	1,031	1	1,112	1,112	1
Transport, postal and warehousing	685	881	0.78	656	752	0.87
Information media and telecom.	105	208	0.51	89	141	0.63
Financial and Insurance Services	150	159	0.95	164	189	0.87
Rental, hiring and real estate	144	116	1.25	200	231	0.87
Professional, scientific and technical services	484	736	0.66	468	575	0.81
Administrative and support services	353	456	0.77	368	433	0.85
Public administration and safety	1,321	1,801	0.73	1,323	1,529	0.87
Education and training	1,008	1,050	0.96	1,137	1,103	1.03
Health care and social assistance	2,268	2,165	1.05	2,200	2,205	1
Arts and recreation services	126	162	0.78	205	225	0.91
Other services	572	664	0.86	519	620	0.84
Total industries	13,457	14,842	0.91	13,043	14,059	0.93

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Goulburn Mulwaree Economic Profile

In terms of self, over the period from 2016 to 2021 the percentage of resident workers employed locally fell by 1.0 per cent across all industries, 1.0 per cent in the Electricity, gas, water and waste services industry and 2.0 per cent in the Construction industry.

Location quotient analysis

An analysis of employment in the Goulburn-Mulwaree LGA (and shown in Table B 20) reveals that in 2020/21 the three industries with the highest LQ relative to Regional NSW were Public administration and safety (1.6), Transport, postal and warehousing (1.3) and Construction (1.2).

Table B 20: Goulburn-Mulwaree LGA's location quotient - employment

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	%.	Regional NSW%	Location Quotient Regional NSW	%.	Regional NSW%	Location Quotient Regional NSW	
Agriculture, forestry and fishing	3.9	6.2	0.6	4.3	6.4	0.67	-0.07
Mining	2.7	3	0.9	1.8	2.7	0.68	0.37
Manufacturing	7	6.9	1.0	6	6.8	0.88	0.15
Electricity, gas, water and waste	0.9	1.4	0.6	1	1.4	0.73	-0.19
Construction	13	10	1.2	8	9	0.93	0.31
Wholesale trade	1.6	1.9	0.8	1.9	2.2	0.88	-0.05
Retail trade	10	10	1.0	12	11	1.1	-0.12
Accommodation and food services	8	8	1.0	9	8	1.01	0
Transport, postal and warehousing	5.1	3.8	1.3	5	4.1	1.22	0.09
Information media and telecom.	0.8	0.8	1.0	0.7	0.9	0.79	0.29
Financial and Insurance Services	1.1	1.8	0.6	1.3	1.9	0.68	-0.11
Rental, hiring and real estate	1.1	1.2	0.9	1.5	1.4	1.08	-0.18
Professional, scientific and technical services	3.6	4.6	0.8	3.6	4.4	0.81	-0.03
Administrative and support services	2.6	2.9	0.9	2.8	3.3	0.85	0.08
Public administration and safety	10	6	1.6	10	6	1.6	-0.03
Education and training	8	9	0.8	9	10	0.92	-0.14
Health care and social assistance	17	16	1.1	17	15	1.13	-0.05
Arts and recreation services	0.9	1.3	0.7	1.6	1.5	1.06	-0.3
Other services	4.3	4.3	1.0	4	4.1	0.97	0.02
Total industries	100	100	1.0	100	100	1	0

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Goulburn Mulwaree Economic Profile

Snowy Valleys LGA

Snowy Valleys LGA Gross Regional Product

Snowy Valleys LGA's GRP was $860 million in the year ending June 2021, up 1.6 per cent from the previous year ($847 million as at June 2020) and below the five year average ($872 million). Local Resident GRP surpassed Local Industry GRP over the last year, suggesting a leakage of economic productivity to other areas beyond the LGA.

Table B 21: Snowy Valleys LGA's GRP measures

Year ending June	Headline GRP $m	% change from previous year	Local industry GRP $m	Local residents GRP $m	Local industry to residents ratio
2021	860	1.6	751	780	0.96
2020	847	-2	705	719	0.98
2019	864	-1.8	693	706	0.98
2018	880	-3.4	726	723	1
2017	910	-2.6	754	750	1
5 year average	872	-	726	736	-

* Headline GRP is the sum of all industries' estimated value added, plus a factor for ownership of dwellings. The value of accommodation is a part of the economy, but it is not part of any industry, so it is included separately. Ownership of dwellings includes actual rents received by landlords, and imputed rents representing the ongoing value of owner-occupied housing.

** Local Industry GRP shows the value of the local economy, generated by the local workers in the LGA regardless of where they live, after taxes and dividends leave the area

*** Local Resident GRP refers to the economic output of the residents of the area regardless of where they work (ie reflects the income received by people in the City).

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Snowy Valley Economic Profile

Snowy Valleys LGA output

The table outlines the output by industry for the Snowy Valleys LGA. Agriculture, forestry and fishing ($486.5 million or 26.9 per cent) and Manufacturing ($434.4 million or 23.9 per cent), generated the largest output in 2020/21, with representations well above the NSW Regional average. The Construction ($212.3 million or 11.7 per cent) and Electricity, gas, water and waste services ($155.1 million or 8.5 per cent) industries were the next largest industries in terms of output, demonstrating their importance to Snowy Valleys' regional economy.

Table B 22: Snowy Valleys LGA's Output by industry sector

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	$m	%.	Regional NSW	$m	%.	Regional NSW	
Agriculture, forestry and fishing	486.5	26.7	8.4	448.9	23.2	7.7	37.6
Mining	4.3	0.2	9.2	22.5	1.2	12.8	-18.1
Manufacturing	434.4	23.9	11.6	588.6	30.5	10.9	-154.1
Electricity, gas, water and waste	155.2	8.5	4.1	188	9.7	4.1	-32.7
Construction	212.3	11.7	14.4	125.4	6.5	12.3	86.9
Wholesale trade	15.7	0.9	2.5	13.9	0.7	2.4	1.8
Retail trade	43.2	2.4	4.3	50.4	2.6	4.2	-7.3
Accommodation and food services	49.4	2.7	3.2	52.2	2.7	3.7	-2.8
Transport, postal and warehousing	52.7	2.9	4.1	77.6	4	4.6	-24.9
Information media and telecom.	1.8	0.1	1.1	7.4	0.4	0.9	-5.5
Financial and Insurance Services	14.2	0.8	3.1	15.4	0.8	3	-1.2
Rental, hiring and real estate	27.8	1.5	7.2	36.3	1.9	8.1	-8.4
Professional, scientific and tech. services	39.2	2.2	4.3	44.9	2.3	4.2	-5.8
Administrative and support services	34.9	1.9	2.3	38.9	2	2.9	-4
Public administration and safety	76.9	4.2	5	67.8	3.5	4.7	9.1
Education and training	46.2	2.5	4.5	49	2.5	4.4	-2.9
Health care and social assistance	94.9	5.2	7.4	63.9	3.3	6.1	30.9
Arts and recreation services	9.5	0.5	0.7	18	0.9	0.9	-8.5
Other services	22.3	1.2	2.5	22	1.1	2.3	0.3
Total industries	**1,821.4**	**100**	**100**	**1,931.1**	**100**	**100**	**-109.7**

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Snowy Valley Economic Profile

Snowy Valleys LGA value added

The table below outlines the value added by industry for the Snowy Valley LGA and shows that Agriculture, forestry and fishing ($176.7 million or 24.5 per cent), Manufacturing ($128.2 million or 17.7 per cent) and Construction ($68.8 million or 9.5 per cent) were the three most productive industries, with these industries combined accounting for $373.7 million or 51.7 per cent of the total value added by industry in the Snowy Valley LGA.

The Electricity, gas, water and waste services industry is also highly productive in the Snowy Valleys LGA, generating $59.6 million of value added in 2020/21 and representing 8.2 per cent of Snowy Valley's total industry value added, which is well above the Regional NSW average. Productivity for the Electricity, gas, water and waste services industry, however, has declined, decreasing by $12.4 million over the five years to 2020/21 particularly over the last year (at $105.5 million in 2019/20).

Table B 23: Snowy Valleys LGA's value added by industry sector

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	$m	%.	Regional NSW	$m	%.	Regional NSW	
Agriculture, forestry and fishing	176.7	24.5	7.5	200.1	25.1	7.8	-23.4
Mining	1.7	0.2	8.8	8.4	1.1	10.9	-6.7
Manufacturing	128.2	17.7	7	169.3	21.3	7	-41.2
Electricity, gas, water and waste	59.6	8.2	3.8	72	9	3.8	-12.4
Construction	68.8	9.5	11	45.6	5.7	9.8	23.2
Wholesale trade	7.6	1.1	3	7.4	0.9	2.9	0.3
Retail trade	25.9	3.6	6	30.9	3.9	5.9	-5
Accommodation and food services	19.9	2.8	3.3	23.7	3	3.8	-3.8
Transport, postal and warehousing	22.4	3.1	4.2	37.5	4.7	5.2	-15.1
Information media and telecom.	0.6	0.1	0.9	3.2	0.4	0.9	-2.6
Financial and Insurance Services	9	1.2	3.9	9.8	1.2	3.9	-0.8
Rental, hiring and real estate	5.1	0.7	3.1	6.5	0.8	3.2	-1.3
Professional, scientific and technical services	19.4	2.7	5.1	21.3	2.7	4.6	-1.9
Administrative and support services	20	2.8	3.2	21.3	2.7	3.7	-1.3
Public administration and safety	45.9	6.4	6.9	41.8	5.2	6.6	4.2
Education and training	35.7	4.9	7.3	36.1	4.5	7.2	-0.4
Health care and social assistance	63.4	8.8	11.7	44.1	5.5	9.5	19.3
Arts and recreation services	3.9	0.5	0.6	8.3	1	0.7	-4.4
Other services	9	1.3	2.5	9.8	1.2	2.4	-0.8
Total industries	722.6	100	100	796.9	100	100	-74.2

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Snowy Valley Economic Profile

Snowy Valleys LGA employment by industry sector

As shown in Table B 24, industries Agriculture, forestry and fishing (1,023 workers or 15.7 per cent), Manufacturing (864 workers or 13.2 per cent) and Health care and social assistance (715 workers or 11 per cent) were the three largest employers in the Snowy Valleys LGA, with these three industries employing 2,602 people in total or 39.9 per cent of the local workers. The total number of workers across all industries in the Snowy Valley LGA increased from 5,887 in 2016 to 6,525 in 2021 (ie – 638 workers). This was largely driven by job growth in the Construction industry.

Table B 24: Snowy Valleys LGA's Employment by industry sector

Industry	2021			2016			2016 - 2021
	No.	%.	Regional NSW	No.	%.	Regional NSW	
Agriculture, forestry and fishing	1,023	15.7	5.4	1,030	17.5	6	-7
Mining	21	0.3	2.5	21	0.4	2.4	--
Manufacturing	864	13.2	5.9	855	14.5	6.2	9
Electricity, gas, water and waste	235	3.6	1.3	197	3.3	1.3	38
Construction	495	7.6	8	328	5.6	7.1	167
Wholesale trade	79	1.2	1.9	72	1.2	2	7
Retail trade	512	7.8	10	502	8.5	11	10
Accommodation and food services	446	6.8	8.3	411	7	8.6	35
Transport, postal and warehousing	234	3.6	3.6	256	4.3	3.8	-22
Information media and telecom.	30	0.5	0.6	17	0.3	0.8	13
Financial and Insurance Services	60	0.9	1.8	59	1	2	1
Rental, hiring and real estate	44	0.7	1.3	29	0.5	1.4	15
Professional, scientific and technical services	138	2.1	4.5	113	1.9	4.4	25
Administrative and support services	181	2.8	2.8	201	3.4	2.9	-20
Public administration and safety	391	6	6.6	327	5.6	6.7	64
Education and training	462	7.1	9.6	406	6.9	9.3	56
Health care and social assistance	715	11	16.9	555	9.4	15.1	160
Arts and recreation services	103	1.6	1.2	64	1.1	1.2	39
Other services	184	2.8	3.9	150	2.5	4	34
Industry not classified	316	4.8	3.8	294	5	3.8	22
Total industries	**6,525**	**100**	**100**	**5,887**	**100**	**100**	**638**

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Snowy Valley Economic Profile

Snowy Valleys LGA's jobs to worker ratio

As shown in Table B 25, the jobs to residents ratio for Snowy Valleys in 2020/21 was 0.97, indicating that there were less jobs than resident workers which was also the case for the Electricity, gas, water and waste services industry (0.9).

Table B 25: Snowy Valley LGA's employment capacity by industry

Industry	2020/2021			2015/2016		
	Local jobs	Employed residents	Ratio of jobs to residents	Local jobs	Employed residents	Ratio of jobs to residents
Agriculture, forestry and fishing	1,173	1,091	1.08	1,442	1,373	1.05
Mining	26	10	2.53	37	20	1.82
Manufacturing	871	742	1.17	1,049	1,025	1.02
Electricity, gas, water and waste	190	211	0.9	226	198	1.14
Construction	748	659	1.14	471	422	1.12
Wholesale trade	56	97	0.57	85	82	1.04
Retail trade	448	540	0.83	566	594	0.95
Accommodation and food services	450	555	0.81	454	472	0.96
Transport, postal and warehousing	237	245	0.96	311	291	1.07
Information media and telecom.	4	6	0.69	57	60	0.96
Financial and Insurance Services	51	50	1.03	65	74	0.87
Rental, hiring and real estate	32	52	0.62	39	50	0.78
Professional, scientific and technical services	120	136	0.89	144	172	0.84
Administrative and support services	202	198	1.02	238	243	0.98
Public administration and safety	359	488	0.73	376	374	1.01
Education and training	436	504	0.86	473	489	0.97
Health care and social assistance	718	751	0.96	654	680	0.96
Arts and recreation services	66	58	1.14	89	84	1.06
Other services	153	163	0.94	173	187	0.92
Total industries	**6,341**	**6,557**	**0.97**	**6,949**	**6,890**	**1.01**

Source: ABS, Census of Population and Housing 2016 and 2021. Compiled and presented in economy.id by.id (informed decisions), Snowy Valley Economic Profile

In terms of self-containment, over the period from 2016 to 2021 the percentage of resident workers employed locally fell by 0.5 per cent across all industries to 87.9 per cent and fell by 3.4 per cent and 1.8 per cent in the Electricity, Gas, Water and Waste Services and Construction industries.

Location quotient analysis

Based on the LQ analysis, industries Agriculture, forestry and fishing and Electricity, gas, water and waste services industry were identified as major specialisations in the LGA in terms of employment (ie with LQs of 3 and 2.07, respectively). As such these are key industries for the local economy, with opportunities to capitalise on these strengths. Manufacturing is another key specialisation in the Snowy Valley LGA.

Table B 26: Snowy Valley LGA's location quotient – employment

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	%.	Regional NSW%	Location Quotient Regional NSW	%.	Regional NSW%	Location Quotient Regional NSW	
Agriculture, forestry and fishing	18.5	6.2	3.0	20.8	6.4	3.25	-0.09
Mining	0.4	3	0.1	0.5	2.7	0.2	-0.3
Manufacturing	13.7	6.9	2.0	15.1	6.8	2.22	-0.11
Electricity, gas, water and waste	3	1.4	2.1	3.3	1.4	2.35	-0.12
Construction	11.8	10.4	1.1	6.8	8.8	0.77	0.47
Wholesale trade	0.9	1.9	0.5	1.2	2.2	0.56	-0.16
Retail trade	7.1	10.3	0.7	8.2	11	0.74	-0.08
Accommodation and food services	7.1	7.6	0.9	6.5	8.4	0.77	0.21
Transport, postal and warehousing	3.7	3.8	1.0	4.5	4.1	1.09	-0.11
Information media and telecom.	0.1	0.8	0.1	0.8	0.9	0.96	-0.91
Financial and Insurance Services	0.8	1.8	0.4	0.9	1.9	0.5	-0.13
Rental, hiring and real estate	0.5	1.2	0.4	0.6	1.4	0.39	0.06
Professional, scientific and technical services	1.9	4.6	0.4	2.1	4.4	0.47	-0.11
Administrative and support services	3.2	2.9	1.1	3.4	3.3	1.03	0.08
Public administration and safety	5.7	6.3	0.9	5.4	6.4	0.85	0.05
Education and training	6.9	9.4	0.7	6.8	9.5	0.72	0.01
Health care and social assistance	11.3	15.8	0.7	9.4	15	0.63	0.14
Arts and recreation services	1	1.3	0.8	1.3	1.5	0.86	-0.05
Other services	2.4	4.3	0.6	2.5	4.1	0.61	-0.07
Total industries	100	100	1	100	100	1	0

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Snowy Valley Economic Profile

Upper Lachlan Shire

Upper Lachlan Shire LGA Gross Regional Product

Upper Lachlan Shire LGA's GRP was $366 million in the year ending June 2021, up 10.7 per cent from the previous year ($331 million as at June 2020) and above the five year average ($358 million). Local Resident GRP has continued to exceed Local Industry GRP over this period, suggesting a leakage of economic productivity to other areas beyond the LGA.

Table B 27: Upper Lachlan Shire's GRP measures

Year ending June	Headline GRP $m	% change from previous year	Local industry GRP $m	Local residents GRP $m	Local industry to residents ratio
2021	366	10.7	313	437	0.72
2020	331	-5.8	292	416	0.7
2019	351	-5.4	311	420	0.74
2018	371	-0.1	332	433	0.77
2017	372	7.6	330	422	0.78
5 year average	358		316	426	

* Headline GRP is the sum of all industries' estimated value added, plus a factor for ownership of dwellings. The value of accommodation is a part of the economy, but it is not part of any industry, so it is included separately. Ownership of dwellings includes actual rents received by landlords, and imputed rents representing the ongoing value of owner-occupied housing.

** Local Industry GRP shows the value of the local economy, generated by the local workers in the LGA regardless of where they live, after taxes and dividends leave the area

*** Local Resident GRP refers to the economic output of the residents of the area regardless of where they work (ie reflects the income received by people in the City).

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Upper Lachlan Economic Profile

Upper Lachlan Shire LGA output

The table outlines the output by industry for the Upper Lachlan Shire LGA. Agriculture, forestry and fishing ($265.6 million or 37.9 per cent), Electricity, gas, water and waste services ($86.6 million or 12.4 per cent) and Construction ($82.5 million or 11.8 per cent) were the three largest industries, with these industries combined accounting for $434.7 million or 62.1 per cent of the total industry output in the Upper Lachlan Shire LGA. Output levels of the Agriculture, forestry and fishing and the Electricity, gas, water and waste services were well above the Regional NSW average.

Table B 28: Upper Lachlan Shire LGA's Output by industry sector

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	$m	%.	Regional NSW	$m	%.	Regional NSW	
Agriculture, forestry and fishing	265.6	37.9	8.4	256.1	43.1	7.7	9.5
Mining	15.6	2.2	9.2	6.2	1	12.8	9.4
Manufacturing	29.1	4.1	11.6	17.6	3	10.9	11.4
Electricity, gas, water and waste	86.6	12.4	4.1	24.7	4.2	4.1	61.9
Construction	82.5	11.8	14.4	74.9	12.6	12.3	7.7
Wholesale trade	10.5	1.5	2.5	9.3	1.6	2.4	1.2
Retail trade	17.1	2.4	4.3	16	2.7	4.2	1.1
Accommodation and food services	13.3	1.9	3.2	16	2.7	3.7	-2.7
Transport, postal and warehousing	14.3	2	4.1	21.3	3.6	4.6	-7.1
Information media and telecom.	4	0.6	1.1	3.9	0.7	0.9	0.1
Financial and Insurance Services	5.8	0.8	3.1	7	1.2	3	-1.2
Rental, hiring and real estate	20.9	3	7.2	27.3	4.6	8.1	-6.4
Professional, scientific and technical services	18.7	2.7	4.3	17.7	3	4.2	1
Administrative and support services	12.4	1.8	2.3	11.7	2	2.9	0.7
Public administration and safety	22.5	3.2	5	16.8	2.8	4.7	5.7
Education and training	24	3.4	4.5	24.5	4.1	4.4	-0.5
Health care and social assistance	28.2	4	7.4	26.3	4.4	6.1	1.9
Arts and recreation services	1.9	0.3	0.7	1.7	0.3	0.9	0.2
Other services	28.4	4	2.5	15.7	2.6	2.3	12.6
Total industries	**701.3**	**100**	**100**	**594.7**	**100**	**100**	**106.6**

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Upper Lachlan Economic Profile

Upper Lachlan Shire LGA value added

The table below outlines the value added by industry for the Upper Lachlan Shire LGA. Agriculture, forestry and fishing ($101.6 million or 35 per cent), Electricity, gas, water and waste services ($32.7 million or 11.2 per cent) and Construction ($27.1 million or 9.3 per cent) were the three most productive industries. With the exception of Construction, the levels of value added of the remaining top three industries were above the Regional NSW average.

Table B 29: Upper Lachlan Shire LGA's value added by industry sector

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	$m	%.	Regional NSW	$m	%.	Regional NSW	
Agriculture, forestry and fishing	101.6	35	7.5	113	41.9	7.8	-11.4
Mining	6.3	2.2	8.8	2.3	0.8	10.9	4.1
Manufacturing	9.4	3.2	7	6	2.2	7	3.3
Electricity, gas, water and waste	32.7	11.2	3.8	10.8	4	3.8	21.9
Construction	27.1	9.3	11	26	9.7	9.8	1.1
Wholesale trade	5.2	1.8	3	4.9	1.8	2.9	0.3
Retail trade	10.3	3.5	6	9.8	3.6	5.9	0.5
Accommodation and food services	5.7	2	3.3	7.2	2.7	3.8	-1.5
Transport, postal and warehousing	5.9	2	4.2	10	3.7	5.2	-4.1
Information media and telecom.	1.5	0.5	0.9	1.8	0.7	0.9	-0.3
Financial and Insurance Services	2.6	0.9	3.9	3.5	1.3	3.9	-1
Rental, hiring and real estate	3.9	1.3	3.1	4.9	1.8	3.2	-1
Professional, scientific and technical services	9.3	3.2	5.1	8.5	3.1	4.6	0.9
Admin. and support services	7.1	2.5	3.2	6.7	2.5	3.7	0.4
Public administration and safety	13.3	4.6	6.9	10.3	3.8	6.6	3
Education and training	17.4	6	7.3	17.5	6.5	7.2	-0.1
Health care and social assistance	19.6	6.7	11.7	18.5	6.9	9.5	1.1
Arts and recreation services	0.6	0.2	0.6	0.8	0.3	0.7	-0.1
Other services	11.1	3.8	2.5	6.9	2.6	2.4	4.2
Total industries	290.7	100	100	269.5	100	100	21.2

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Upper Lachlan Economic Profile

Upper Lachlan Shire LGA employment by industry sector

As shown in Table B 30, industries Agriculture, forestry and fishing (947 workers or 35.4 per cent), Health Care and Social Assistance (276 workers or 10.3 per cent) and Construction (174 workers or 6.5 per cent) were the three largest employers in the Upper Lachlan Shire, with these three industries employing 1,397 people in total or 52.2 per cent of the local workers. The total number workers across all industries in the Upper Lachlan Shire increased modestly from 2,494 in 2016 to 2,676 in 2021 (ie 182 local workers). Employment remained relatively stable across most industries.

Table B 30: Upper Lachlan Shire LGA's Employment by industry sector

Industry	2021			2016			2016-2021
	No.	%.	Regional NSW	No.	%.	Regional NSW	
Agriculture, forestry and fishing	947	35.4	5.4	901	36.1	6	46
Mining	3	0.1	2.5	0	0	2.4	3
Manufacturing	78	2.9	5.9	51	2	6.2	27
Electricity, gas, water and waste	39	1.5	1.3	32	1.3	1.3	7
Construction	174	6.5	8	134	5.4	7.1	40
Wholesale trade	33	1.2	1.9	36	1.4	2	-3
Retail trade	144	5.4	10	182	7.3	11	-38
Accommodation and food services	136	5.1	8.3	159	6.4	8.6	-23
Transport, postal and warehousing	59	2.2	3.6	63	2.5	3.8	-4
Information media and telecom.	17	0.6	0.6	18	0.7	0.8	-1
Financial and Insurance Services	24	0.9	1.8	13	0.5	2	11
Rental, hiring and real estate	19	0.7	1.3	10	0.4	1.4	9
Professional, scientific and technical services	111	4.1	4.5	89	3.6	4.4	22
Administrative and support services	46	1.7	2.8	49	2	2.9	-3
Public administration and safety	158	5.9	6.6	143	5.7	6.7	15
Education and training	195	7.3	9.6	184	7.4	9.3	11
Health care and social assistance	276	10.3	16.9	231	9.3	15.1	45
Arts and recreation services	20	0.7	1.2	15	0.6	1.2	5
Other services	109	4.1	3.9	100	4	4	9
Industry not classified	94	3.5	3.8	84	3.4	3.8	10
Total industries	**2,676**	**100**	**100**	**2,494**	**100**	**100**	**182**

Source: ABS Census of Population and Housing 2016 and 2021. Compiled and presented in economy.id by.id (informed decisions), Upper Lachlan Economic Profile

Upper Lachlan Shire LGA's jobs to worker ratio

As shown in Table B 31 the jobs to residents ratio for Upper Lachlan Shire in 2020/21 was low at 0.65, indicating that there were less jobs than resident workers. Electricity, gas, water and waste services had the highest ratio (4.64), with opportunities to capitalise on the strength and drive the jobs to resident ratio upwards.

Table B 31: Upper Lachlan Shire LGA's employment capacity by industry

Industry	2020/2021			2015/2016		
	Local jobs	Employed residents	Ratio of jobs to residents	Local jobs	Employed residents	Ratio of jobs to residents
Agriculture, forestry and fishing	918	919	1	1098	1061	1.03
Mining	20	57	0.35	5	29	0.18
Manufacturing	101	169	0.6	72	140	0.51
Electricity, gas, water and waste	112	24	4.64	29	47	0.62
Construction	237	362	0.66	211	334	0.63
Wholesale trade	34	49	0.7	44	65	0.67
Retail trade	157	302	0.52	200	274	0.73
Accommodation and food services	141	183	0.77	172	205	0.84
Transport, postal and warehousing	53	176	0.3	76	168	0.45
Information media and telecom.	15	26	0.56	16	26	0.6
Financial and Insurance Services	11	39	0.29	22	46	0.49
Rental, hiring and real estate	6	13	0.48	13	47	0.29
Professional, scientific and technical services	100	249	0.4	103	186	0.55
Administrative and support services	66	82	0.8	71	97	0.73
Public administration and safety	172	534	0.32	146	371	0.39
Education and training	189	332	0.57	203	311	0.65
Health care and social assistance	239	489	0.49	265	448	0.59
Arts and recreation services	8	29	0.28	22	43	0.5
Other services	163	179	0.91	115	134	0.86
Total industries	2,744	4213	0.65	2,883	4,035	0.71

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Upper Lachlan Economic Profile

In terms of self-containment, in 2021, just over half (ie 53.9 per cent) of the Upper Lachlan Shire LGA's resident workers were employed locally, with only 38 per cent of resident workers employed in the local Construction industry.

Location quotient analysis

Based on the LQ analysis, industries Agriculture, forestry and fishing and Electricity, gas, water and waste services industry were identified as major specialisations in the LGA in terms of employment (ie with LQs of 5.36 and 2.82, respectively). As such these are key industries for the local economy, with opportunities to capitalise on these strengths.

Table B 32: Upper Lachlan Shire LGA's location quotient - employment

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	%.	Regional NSW%	Location Quotient Regional NSW	%.	Regional NSW%	Location Quotient Regional NSW	
Agriculture, forestry and fishing	33.5	6.2	5.36	38.1	6.4	5.97	-0.1
Mining	0.7	3	0.24	0.2	2.7	0.07	2.67
Manufacturing	3.7	6.9	0.53	2.5	6.8	0.37	0.45
Electricity, gas, water and waste	4.1	1.4	2.82	1	1.4	0.73	2.88
Construction	8.7	10.4	0.83	7.3	8.8	0.84	0
Wholesale trade	1.3	1.9	0.68	1.5	2.2	0.7	-0.03
Retail trade	5.7	10.3	0.55	7	11	0.63	-0.13
Accommodation and food services	5.1	7.6	0.68	6	8.4	0.71	-0.04
Transport, postal and warehousing	1.9	3.8	0.51	2.6	4.1	0.64	-0.21
Information media and telecom.	0.5	0.8	0.7	0.5	0.9	0.63	0.12
Financial and Insurance Services	0.4	1.8	0.23	0.8	1.9	0.41	-0.45
Rental, hiring and real estate	0.2	1.2	0.19	0.5	1.4	0.33	-0.42
Professional, scientific and technical services	3.7	4.6	0.8	3.6	4.4	0.8	-0.01
Administrative and support services	2.4	2.9	0.84	2.5	3.3	0.74	0.13
Public administration and safety	6.3	6.3	0.99	5	6.4	0.79	0.25
Education and training	6.9	9.4	0.73	7	9.5	0.74	-0.02
Health care and social assistance	8.7	15.8	0.55	9.2	15	0.61	-0.1
Arts and recreation services	0.3	1.3	0.23	0.7	1.5	0.5	-0.54
Other services	5.9	4.3	1.38	4	4.1	0.97	0.42
Total industries	100	100	1	100	100	1	0

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Upper Lachlan Economic Profile

Yass Valley LGA

Yass Valley LGA Gross Regional Product

Yass Valley LGA's GRP was $621 million in the year ending June 2021, up 1 per cent from the previous year ($615 million as at June 2020) and below the five year average ($658 million). Local Resident GRP has continued to exceed Local Industry GRP over this period, suggesting a leakage of economic productivity to other areas beyond the LGA.

Table B 33: Yass Valley LGA's GRP measures

Year ending June	Headline GRP $m	% change from previous year	Local industry GRP $m	Local residents GRP $m	Local industry to residents ratio
2021	621	1	564	1,219	0.46
2020	615	-8.5	566	1,197	0.47
2019	672	-3.9	608	1,140	0.53
2018	700	2.5	619	1,125	0.55
2017	683	0.6	579	1,083	0.53
5 year average	658		587	1,153	

* Headline GRP is the sum of all industries' estimated value added, plus a factor for ownership of dwellings. The value of accommodation is a part of the economy, but it is not part of any industry, so it is included separately. Ownership of dwellings includes actual rents received by landlords, and imputed rents representing the ongoing value of owner-occupied housing.

** Local Industry GRP shows the value of the local economy, generated by the local workers in the LGA regardless of where they live, after taxes and dividends leave the area

*** Local Resident GRP refers to the economic output of the residents of the area regardless of where they work (ie reflects the income received by people in the City).

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Yass Valley Economic Profile

Yass Valley LGA output

The table below outlines the output by industry for the Yass Valley LGA. Agriculture, forestry and fishing ($238.3 million or 24.4 per cent), Construction ($143.9 million or 14.7 per cent) and Rental, hiring and real estate services ($99.7 million or 10.2 per cent) were the three largest industries, with these industries combined accounting for $481.9 million or 49.3 per cent of the total output by total industry in the Yass Valley. Output levels of Agricultural, forestry and fishing and construction were above the Regional NSW average.

The Electrical, gas, water and waste services industry is another key industry, generating $46.9 million in output and represents 4.8 per cent of the total industry output.

Table B 34: Yass Valley LGA's Output by industry sector

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	$m	%.	Regional NSW	$m	%.	Regional NSW	
Agriculture, forestry and fishing	238.3	24.4	8.4	188.3	17.1	7.7	50
Mining	1.3	0.1	9.2	1.4	0.1	12.8	-0.2
Manufacturing	42.3	4.3	11.6	62.2	5.6	10.9	-19.9
Electricity, gas, water and waste	46.9	4.8	4.1	47.5	4.3	4.1	-0.6
Construction	143.9	14.7	14.4	277	25.1	12.3	-133.1
Wholesale trade	25	2.6	2.5	21.1	1.9	2.4	3.9
Retail trade	41.8	4.3	4.3	35.4	3.2	4.2	6.5
Accommodation and food services	46.5	4.8	3.2	59.1	5.4	3.7	-12.5
Transport, postal and warehousing	30.2	3.1	4.1	31.6	2.9	4.6	-1.4
Information media and telecom.	3.8	0.4	1.1	6.2	0.6	0.9	-2.4
Financial and Insurance Services	11.1	1.1	3.1	9.1	0.8	3	2
Rental, hiring and real estate	99.7	10.2	7.2	130.4	11.8	8.1	-30.7
Professional, scientific and technical services	66.1	6.8	4.3	55.8	5.1	4.2	10.3
Administrative and support services	22.4	2.3	2.3	26.8	2.4	2.9	-4.5
Public administration and safety	40.6	4.2	5	34.4	3.1	4.7	6.3
Education and training	31.3	3.2	4.5	37.6	3.4	4.4	-6.3
Health care and social assistance	56.2	5.8	7.4	51.9	4.7	6.1	4.3
Arts and recreation services	3.5	0.4	0.7	5.6	0.5	0.9	-2.1
Other services	26.2	2.7	2.5	21.7	2	2.3	4.5
Total industries	**977.1**	**100**	**100**	**1,103.0**	**100**	**100**	**-125.9**

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Yass Valley Economic Profile

Yass Valley LGA value added

The table below outlines the value added by industry for the Yass Valley LGA. Agriculture, forestry and fishing ($90.6 million or 22 per cent), Construction (46.2 million or 11.2 per cent) and Health care and social assistance ($39.6 million or 9.6 per cent) were the three most productive industries, with these industries combined accounting for $176.4 million or 42.8 per cent of the total value added by industry in the Yass Valley LGA.

Electrical, gas, water and waste services industry was also a highly productive industry accounting for 4.7 per cent (or $19.2 million) of the LGA's total industry value added which is broadly in line with 2015/16 levels (at $19.6 million) and above the Regional NSW average. This highlights the industry's ongoing contribution to the regional economy.

Table B 35: Yass Valley LGA's value added by industry sector

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	$m	%.	Regional NSW	$m	%.	Regional NSW	
Agriculture, forestry and fishing	90.6	22	7.5	83.8	18.2	7.8	6.8
Mining	0.5	0.1	8.8	0.7	0.2	10.9	-0.2
Manufacturing	13.2	3.2	7	20.1	4.4	7	-7
Electricity, gas, water and waste	19.2	4.7	3.8	19.6	4.2	3.8	-0.3
Construction	46.2	11.2	11	90.5	19.6	9.8	-44.3
Wholesale trade	12.1	2.9	3	11.1	2.4	2.9	0.9
Retail trade	25.1	6.1	6	21.7	4.7	5.9	3.4
Accommodation and food services	19.1	4.6	3.3	26.7	5.8	3.8	-7.7
Transport, postal and warehousing	13	3.2	4.2	15.4	3.3	5.2	-2.4
Information media and telecom.	1.5	0.4	0.9	2.8	0.6	0.9	-1.4
Financial and Insurance Services	7.7	1.9	3.9	6	1.3	3.9	1.7
Rental, hiring and real estate	18.6	4.5	3.1	23.2	5	3.2	-4.6
Professional, scientific and technical services	33.2	8.1	5.1	26.7	5.8	4.6	6.5
Administrative and support services	12.6	3.1	3.2	14.9	3.2	3.7	-2.3
Public administration and safety	24.1	5.9	6.9	21.1	4.6	6.6	3
Education and training	23.9	5.8	7.3	27	5.9	7.2	-3.1
Health care and social assistance	39.6	9.6	11.7	36.9	8	9.5	2.7
Arts and recreation services	1.3	0.3	0.6	2.2	0.5	0.7	-1
Other services	10.9	2.6	2.5	10.3	2.2	2.4	0.5
Total industries	412.3	100	100	460.9	100	100	-48.6

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Yass Valley Economic Profile

Yass Valley LGA employment by industry sector

As shown in Table B 36, industries Agriculture, forestry and fishing (663 workers or 14.6 per cent), Construction (521 workers or 11.5 per cent) and Health Care and social assistance (496 workers or 10.9 per cent) were the three largest employers in the Yass Valley LGA, with these three industries employing 1,680 people in total or 37 per cent of the local workers. The total number of workers across all industries in the Yass Valley LGA increased from 3,791 in 2016 to 4,533 in 2021 (ie 742 local workers).

Table B 36: Yass Valley LGA's Employment by industry sector

Industry	2021			2016			2016 - 2021
	No.	%.	Regional NSW	No.	%.	Regional NSW	
Agriculture, forestry and fishing	663	14.6	5.4	603	15.9	6	60
Mining	26	0.6	2.5	18	0.5	2.4	8
Manufacturing	232	5.1	5.9	137	3.6	6.2	95
Electricity, gas, water and waste	102	2.3	1.3	41	1.1	1.3	61
Construction	521	11.5	8	339	8.9	7.1	182
Wholesale trade	90	2	1.9	74	2	2	16
Retail trade	362	8	10	341	9	11	21
Accommodation and food services	470	10.4	8.3	461	12.2	8.6	9
Transport, postal and warehousing	118	2.6	3.6	110	2.9	3.8	8
Information media and telecom.	28	0.6	0.6	26	0.7	0.8	2
Financial and Insurance Services	32	0.7	1.8	38	1	2	-6
Rental, hiring and real estate	58	1.3	1.3	54	1.4	1.4	4
Professional, scientific and technical services	255	5.6	4.5	194	5.1	4.4	61
Administrative and support services	106	2.3	2.8	77	2	2.9	29
Public administration and safety	250	5.5	6.6	205	5.4	6.7	45
Education and training	368	8.1	9.6	333	8.8	9.3	35
Health care and social assistance	496	10.9	16.9	395	10.4	15.1	101
Arts and recreation services	59	1.3	1.2	50	1.3	1.2	9
Other services	157	3.5	3.9	129	3.4	4	28
Industries not classified	147	3.2	3.8	166	4.4	3.8	-19
Total industries	4,533	100	100	3,791	100	100	742

Source: ABS Census of Population and Housing 2016 and 2021. Compiled and presented in economy.id by.id (informed decisions), Yass Valley Economic Profile

Yass Valley LGA's jobs to worker ratio

As shown in Table B 37, the jobs to residents ratio for Snowy Valleys in 2020/21 was low at 0.41, indicating that there were fewer jobs than resident workers. The Electricity, gas, water and waste services and the Construction industries had one of the lowest jobs to worker ratio at 0.44 and 0.5, respectively, suggesting there are opportunities to provide more local jobs in these industries.

Table B 37: Yass Valley LGA's employment capacity by industry

Industry	2020/2021			2015/2016		
	Local jobs	Employed residents	Ratio of jobs to residents	Local jobs	Employed residents	Ratio of jobs to residents
Agriculture, forestry and fishing	733	657	1.12	705	684	1.03
Mining	11	23	0.48	14	15	0.94
Manufacturing	134	205	0.66	176	247	0.71
Electricity, gas, water and waste	57	129	0.44	55	164	0.34
Construction	345	694	0.5	582	1,199	0.49
Wholesale trade	62	132	0.47	83	149	0.56
Retail trade	413	747	0.55	409	624	0.66
Accommodation and food services	474	561	0.85	584	612	0.96
Transport, postal and warehousing	115	256	0.45	136	255	0.53
Information media and telecom.	13	134	0.1	19	125	0.15
Financial and Insurance Services	18	97	0.18	22	121	0.18
Rental, hiring and real estate	54	70	0.78	66	147	0.45
Professional, scientific and technical services	233	1,207	0.19	205	740	0.28
Administrative and support services	115	247	0.46	120	232	0.52
Public administration and safety	219	2,377	0.09	202	1,666	0.12
Education and training	348	828	0.42	411	838	0.49
Health care and social assistance	458	882	0.52	500	927	0.54
Arts and recreation services	44	107	0.41	64	168	0.39
Other services	157	374	0.42	164	339	0.48
Total industries	4,002	9,727	0.41	4,519	9,251	0.49

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Yass Valley Economic Profile

Self-containment measures indicate that in 2021, only 38.8 per cent of the Yass Valley LGA's resident workers were employed locally. 45.4 per cent and 32.2 per cent of resident workers were employed in the local Electricity, gas, water and waste service and Construction industries.

Location quotient analysis

Based on the LQ analysis, the Electricity, gas, water and waste services industry had a LQ of 0.98 which is broadly of similar importance to the LGA as Regional NSW. As such there is opportunities to grow this industry. Agriculture, forestry and fishing was identified as a major specialisation in the Yass Valley LGA, with Accommodation and food services and Professional, scientific and technical services also identified as significant specialisations.

Table B 38: Yass Valley LGA's location quotient – employment

Industry	2020/2021			2015/2016			2015/16 - 2020/21
	%.	Regional NSW%	Location Quotient Regional NSW	%.	Regional NSW%	Location Quotient Regional NSW	
Agriculture, forestry and fishing	18.3	6.2	2.94	15.6	6.4	2.44	0.2
Mining	0.3	3	0.09	0.3	2.7	0.11	-0.17
Manufacturing	3.4	6.9	0.48	3.9	6.8	0.57	-0.15
Electricity, gas, water and waste	1.4	1.4	0.98	1.2	1.4	0.88	0.11
Construction	8.6	10.4	0.83	12.9	8.8	1.47	-0.44
Wholesale trade	1.6	1.9	0.83	1.8	2.2	0.84	-0.01
Retail trade	10.3	10.3	1	9.1	11	0.82	0.21
Accommodation and food services	11.8	7.6	1.56	12.9	8.4	1.53	0.02
Transport, postal and warehousing	2.9	3.8	0.75	3	4.1	0.73	0.02
Information media and telecom.	0.3	0.8	0.43	0.4	0.9	0.49	-0.12
Financial and Insurance Services	0.4	1.8	0.24	0.5	1.9	0.26	-0.1
Rental, hiring and real estate	1.3	1.2	1.11	1.5	1.4	1.03	0.08
Professional, scientific and technical services	5.8	4.6	1.27	4.5	4.4	1.02	0.24
Administrative and support services	2.9	2.9	1	2.7	3.3	0.8	0.25
Public administration and safety	5.5	6.3	0.87	4.5	6.4	0.7	0.23
Education and training	8.7	9.4	0.92	9.1	9.5	0.96	-0.04
Health care and social assistance	11.4	15.8	0.72	11.1	15	0.74	-0.02
Arts and recreation services	1.1	1.3	0.86	1.4	1.5	0.96	-0.1
Other services	3.9	4.3	0.91	3.6	4.1	0.88	0.03
Total industries	100	100	1	100	100	1	0

Source: NIEIR ©2021. Compiled and presented in economy.id by.id (informed decisions), Yass Valley Economic Profile

APPENDIX C : MULTIPLIER IMPACTS

The construction industry is a significant component of the economy, accounting for 5.96 per cent of Gross domestic product (GDP) and employing just over one million workers across Australia[11]. The industry has strong linkages with other sectors, so the impacts on the economy go further than the direct contribution of construction. This is known as the multiplier effect. Multipliers refer to the level of additional economic activity generated by a source industry.

There are two types of effects captured by multipliers: Production Induced Effects, and Consumption Induced Effects.

Production Induced Effects are made up of:

- First round effect: which is all outputs and employment required to produce the inputs for construction
- Industrial support effect: which is the induced extra output and employment from all industries to support the production of the first round effect

Consumption Induced Effects relates to the demand for additional goods and services due to increased spending by the wage and salary earners across all industries arising from employment. This also includes any flow on effects from employing workers who subsequently consume goods and services locally as a household and/or use local accommodation or stay in temporary accommodation camps.

The source of the multipliers adopted in this report is *Australian National Accounts: Input-Output Tables 2018-19*.

Note that the multiplier effects are national, and not necessarily local. The ABS Australian National Accounts states that:

> *"Care is needed in interpreting multiplier effects; their theoretical basis produces estimates which somewhat overstate the actual impacts in terms of output and employment. Nevertheless, the estimates illustrate the high flow-on effects of construction activity to the rest of the economy. Clearly, through its multipliers, construction activity has a high impact on the economy."*

In particular, the multiplier impacts can leave the impression that resources would not have been used elsewhere in the economy had the development not proceeded. In reality, many of these resources would have been employed elsewhere. Note that the NSW Treasury guidelines state:

> *"Direct or flow on jobs will not necessarily occur in the immediate vicinity of the project – they may be located in head office of the supplier or in a factory in another region or State that supplies the project"*[12].

Nevertheless, economic multiplier impacts represent considerable added value to the Australian economy from the construction industry.

Multiplier impacts vary depending on the standing of the economy which is being measured – national, State, regional or local. The ABS Input Output tables are used to develop the national multipliers but at a smaller geographical level such as State level, regional or local government level the multipliers diminish for two reasons.

Firstly production induced impacts spread over a wider area. If a project is unable to acquire supplies to production at a local level cost effectively it would source those inputs from outside the region so the production induced impacts at the local area level are not as robust as they are at the national level.

Secondly there may be labour shortages at a small area level and workers may need to be imported from outside the area. Where production is limited in time, with a temporary mine or construction project for example, then temporary accommodation and/or fly-in/fly-out operations may be required for the workers. As a further example, Jindabyne in the Snowy Mountains has a high peak tourist season which requires an influx of temporary

[11] Source: IBIS World Construction Industry Report 2018

[12] Source: Office of Financial Management Policy & Guidelines Paper: Policy & Guidelines: Guidelines for estimating employment supported by the actions, programs and policies of the NSE Government (TPP 09-7) NSW Treasury

workers to meet high demand for services. Hence many of the workers during the peak tourist season are not residents in the local area. Also basic community services for the workers, in the case of a temporary mine for example, may be sourced outside the local area level. As a result, the consumption induced impacts diminish with the size of the economy.

Estimating the impacts at a smaller area level is complex and the results become increasingly uncertain because many inputs could be sourced either from the local area, elsewhere in the State or even from another State. We have made a most likely estimate using industry data from Census 2016. The method involves deriving a 'location quotient' for the given region (a comparison of relative industry employment between the region and the nation) and, deriving the technical coefficients from the ABS Input-Output tables and rescaling them to suit the defined region.

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SYDNEY

Level 3, 234 George Street
Sydney NSW 2000
GPO Box 2748 Sydney NSW 2001
t: +61 2 9252 8777
f: +61 2 9252 6077
e: sydney@hillpda.com

MELBOURNE

Suite 114, 838 Collins Street
Docklands VIC 3008
t: +61 3 9629 1842
f: +61 3 9629 6315
e: melbourne@hillpda.com

WWW.HILLPDA.COM