Transgrid

People. Power. Possibilities.

Environmental Impact Statement

EnergyConnect (NSW – Eastern Section)

Technical paper 7 – Economic impact assessment

EnergyConnect –

NSW Eastern Section

Technical Paper 7 –
Economic Impact Assessment

Prepared for

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EXECUTIVE SUMMARY

Transgrid (electricity transmission operator in New South Wales (NSW)) and ElectraNet (electricity transmission operator in South Australia (SA)) is currently investigating the proposed construction and operation of a new electrical interconnector and network support options between NSW and SA, with an added connection to north–west Victoria.

The proposal, focussing on the eastern section of EnergyConnect in NSW, would include the construction and operation of a new high voltage transmission line between the existing Buronga substation and existing Wagga Wagga substation, a new 330kV substation (referred to as the proposed Dinawan 330kV substation), upgrade and expansion of the existing Wagga Wagga substation as well as other ancillary infrastructure.

Transgrid has engaged a construction contractor for the delivery of EnergyConnect components in NSW and Victoria.

The proposal would provide economic activity to the regional economy (comprising the local government areas of Wentworth, Balranald, Murray River, Edward River, Hay, Murrumbidgee, Federation, Lockhart and Wagga Wagga), particularly during the 18-month construction phase. This economic activity in the regional economy arises from:

- expenditure in the region on non–labour inputs to production;
- direct employment of local labour; and
- expenditure of labour wages in the local economy.

The Economic Assessment was based on information provided by the construction contractor on direct regional employment, income of employees and regional procurement. The impact of this on the regional economy was estimated using input–output analysis.

The total economic impact of the non–wage expenditure ($106.2 million) in the regional economy during year 1 (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 year 1 (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.

Hence, total annual employment generated by the proposal during year 1 of construction for people that live permanently in the region is estimated at 698 i.e. 100 direct jobs, 17 jobs from wage expenditures and 571 jobs from non-labour expenditure.

Year 2 of construction (6-months) would provide half the above level of regional economic activity.

The economic activity generated by the proposal for NSW would be greater than that reported for the region because:

- the NSW economy is larger than the regional economy and therefore more able to provide the direct inputs to production and labour required for the proposal i.e. less leakages; and
- there is a greater level of linkages in the NSW economy than the regional economy and hence multiplier effects would be larger.

However, the main economic effect for NSW relates to its contribution to the provision of secure and reliable electricity in the near term, while facilitating the longer–term transition across the NEM to low–emission energy sources. A cost–benefit analysis prepared as part of the Regulatory Investment Test for Transmission (RIT–T) process for the Australian Energy Regulator (AER) shows that the new interconnector is expected to deliver net market benefits of approximately $900 million over 21 years (in present value terms).

1 Introduction

1.1 Proposal context and overview

Transgrid (electricity transmission operator in New South Wales (NSW)) and ElectraNet (electricity transmission operator in South Australia (SA)) are seeking regulatory and environmental planning approval for the construction and operation of a new High Voltage (HV) interconnector between NSW and SA, with an added connection to north–west Victoria. Collectively, the proposed interconnector is known as EnergyConnect.

EnergyConnect aims to reduce the cost of providing secure and reliable electricity transmission between NSW and SA in the near term, while facilitating the longer–term transition of the energy sector across the National Electricity Market (NEM) to low emission energy sources.

EnergyConnect has been identified as a priority transmission project in the NSW Transmission Infrastructure Strategy (NSW Department of Planning and Environment (DPE), 2018), linking the SA and NSW energy markets and would assist in transporting energy from the South–West Renewable Energy Zone to major demand centres.

EnergyConnect comprises of several sections (shown on Figure 1.1) that would be subject to separate environmental planning approvals under the relevant jurisdictions. It includes:

- NSW sections including:
  - Western Section, which would extend from:
    - the SA/NSW border (near Chowilla in SA) to Transgrid's existing Buronga substation
    - Buronga substation to the NSW/Victoria border at Monak (near Red Cliffs in Victoria)
  - Eastern Section, which would extend from the Buronga substation to the existing Wagga Wagga substation
- a Victorian Section, which would extend from the NSW/Victoria border to Red Cliffs substation
- a SA Section, which would extend from Robertstown to the SA/NSW border.

Transgrid is currently seeking planning approval for the NSW – Eastern Section (the proposal), which is the subject of this EIS.

Transgrid has previously sought, and received, separate environmental planning approvals for the NSW – Western Section of EnergyConnect and Victorian Section. ElectraNet is responsible for obtaining environmental planning approval for the section of EnergyConnect located in SA.

1.1.1 Proposal objectives

The primary objective for EnergyConnect (which the proposal comprises an extensive component of) is to reduce the cost of electricity by providing secure electricity transmission between NSW and SA in the near term and facilitate the longer–term transition of the energy sector across the NEM to low emission energy generation sources. More specifically, EnergyConnect (including the proposal) aims to:

- lower power prices
- improve energy security
- increase economic activity
- support the transition to a lower carbon emission energy system
- support a greater mix of renewable energy in the NEM.

Figure 1.1: Overview of EnergyConnect

1.2 The proposal

Transgrid is seeking approval under Division 5.2, Part 5 of the *Environmental Planning and Assessment Act 1979* (the EP&A Act) to construct and operate the proposal. The proposal has been declared as Critical State significant infrastructure under Section 5.13 of the EP&A Act.

The proposal was also declared a controlled action on 30 September 2020 and requires a separate approval under the (Commonwealth) *Environment Protection and Biodiversity Conservation Act 1999*. The proposal is subject to the bilateral assessment process that has been established between the Australian and NSW governments.

1.3 Proposal overview

1.3.1 Study area

The study area for this economic assessment comprises the Local Government Areas (LGAs) within which the proposal is located i.e. Wentworth; Balranald; Murray River; Edward River; Hay; Murrumbidgee; Federation; Lockhart; and Wagga Wagga LGAs.

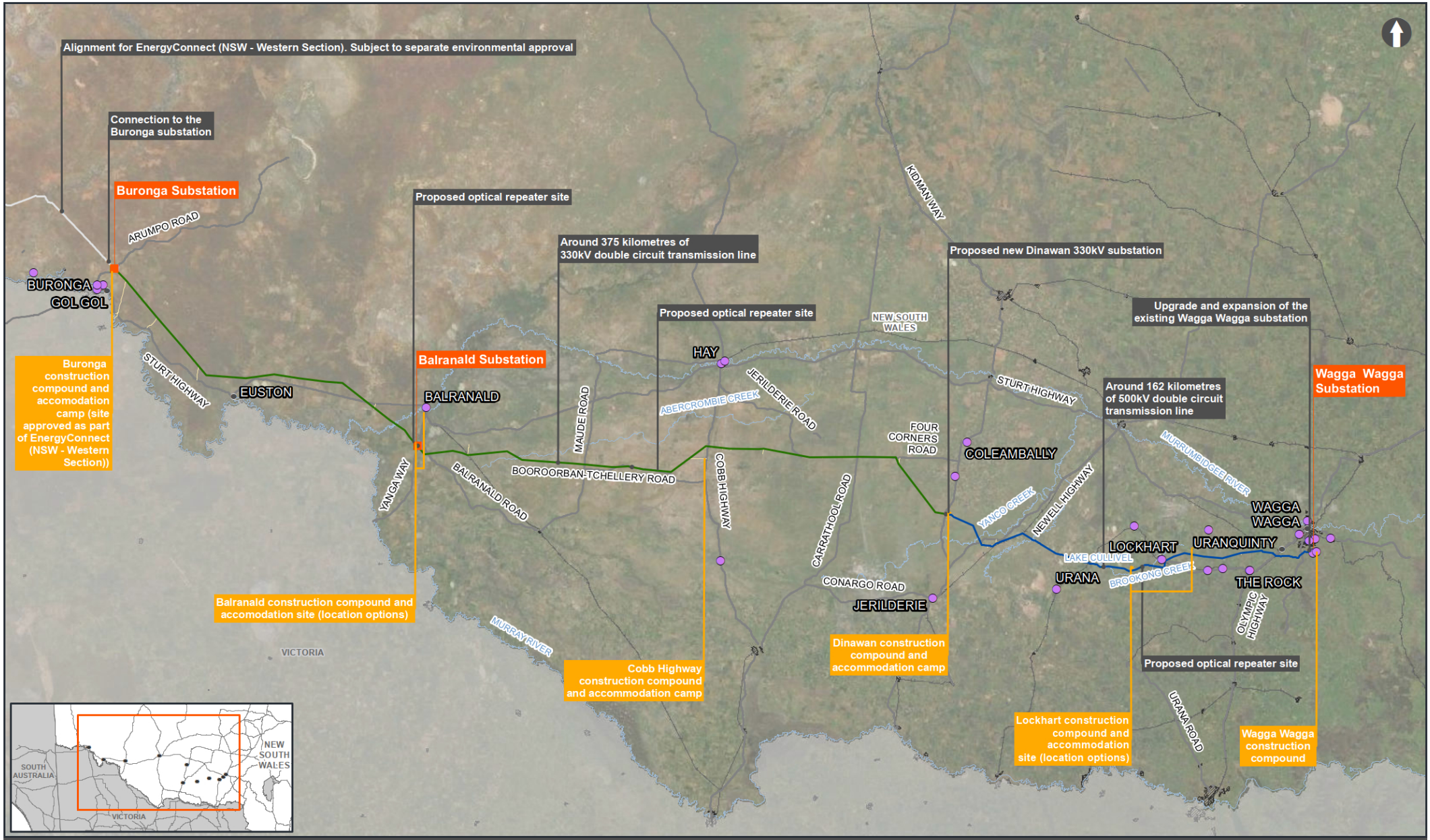

Figure 1-2

Proposal Overview - EnergyConnect (NSW - Eastern section)

1.3.2 Key features of the proposal

The key components of the proposal include:

- about 375 kilometres of new 330 kilovolt (kV) double circuit transmission line and associated infrastructure between the existing Buronga substation and the proposed Dinawan 330kV substation
- connection of the proposed transmission lines to the existing Buronga 330kV substation
- construction of a new 330kV substation around 30 kilometres south of Coleambally, known as the proposed Dinawan 330kV substation
- connection of the proposed transmission lines to the proposed Dinawan 330kV substation
- upgrade and expansion of the Wagga Wagga substation to accommodate the new transmission line connections including the installation of three new line bays, relocation and upgrade of existing two reallocated bays and associated electrical and civil works (road, kerb, gutter, drainage works and earthworks)
- upgrade and expansion of the Wagga Wagga substation to accommodate three new line bays, two reallocated bays and associated civil works (road, kerb, gutter, drainage works and earthworks)
- provision of three optical repeater structures and associated connections to existing local electrical supplies
- new and/or upgrade of access tracks as required
- ancillary works required to facilitate the construction of the proposal (e.g. laydown and staging areas, concrete batching plants, brake/winch sites, site offices and accommodation camps).

An overview of the proposal is provided in Figure 1.2. Further detail on the key infrastructure components of the proposal and construction activities are provided in Chapter 5 and Chapter 6 of the main EIS document respectively.

1.3.3 Construction

<u>Key construction works</u>

Key construction works for the proposal would typically include (but not be limited to):

- site establishment works, which may include (but not be limited to):
  - establishment of construction compound and accommodation sites, access tracks and service relocations
  - vegetation clearance
  - transportation of equipment such as steelwork, high voltage plant and switchgear between dock and site as part of the construction works
- ancillary works to facilitate the construction of the proposal (e.g. intermediate laydown and staging areas, concrete batching plants, brake/winch sites, site offices and accommodation camps)
- construction of the proposed transmission lines, which would include (but not be limited to):
  - access tracks to accommodate safe access of construction machinery and materials to each transmission line tower site
  - earthworks (including establishment of construction pads) and the construction of footings and foundations for each transmission line tower
  - erection of the new transmission line towers using crane(s) and or helicopter(s)
  - stringing of the conductors and overhead earth wires and optical ground wire

  - installation of earthing conductors
  - testing and commissioning of the transmission lines
- construction of the proposed Dinawan 330kV substation, which would include (but not be limited to):
  - civil construction works including earthworks
  - slab construction at the expanded substation site
  - electrical fit out with new substation equipment;
  - testing and commissioning of the new substation equipment
- upgrade and expansion of the existing Wagga Wagga substation to enable the proposed connection and operation of the new transmission lines which would include (but not be limited to):
  - civil construction works including earthworks and slab construction at the expanded substation site;
  - electrical fit out with new substation equipment;
  - testing and commissioning of the new substation equipment;
- connection of the proposed transmission lines to the existing Buronga substation
- demobilisation and remediation of areas disturbed by construction activities.

A detailed description of construction works for the proposal is further described in Chapter 6 of the Environmental Impact Statement (EIS).

Construction program

Construction of the proposal would commence in late-2022 (enabling works phase), subject to NSW Government and Commonwealth planning approvals.

The main construction works phase for the transmission lines and substation facilities would take around 18 months. The upgraded Wagga Wagga substation and proposed Dinawan 330kV substation are expected to be operational by August 2024. Removal and re-instatement of construction compounds and associated works and remediation would extend around six months beyond the commissioning phase, with estimated completion in March 2025.

The final program would be confirmed as part of finalisation of the proposal infrastructure following approval of the proposal.

Indicative duration of transmission line construction activities

Construction at each transmission line tower would be intermittent and construction activities would not occur for the full duration at any one location. Figure 1-3 presents an indicative duration of construction activities associated with the transmission line towers. These durations could vary and breaks between activities may be shorter which may lead to longer inactive periods in subsequent stages of construction at an individual transmission line tower. Durations of any particular construction activity, and 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.

These activities would also have multiple work fronts, therefore (for example) foundation works or tower erection would be occurring in several locations along the easement at the same time.

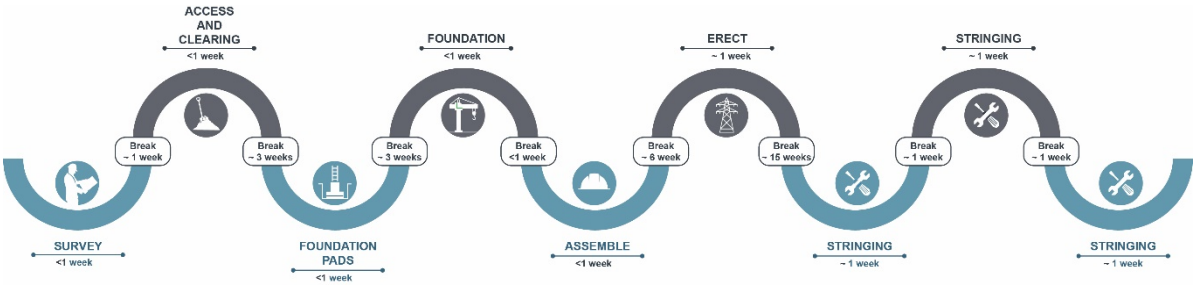

Figure 1.3 Indicative duration of construction activities at transmission line towers

1.4 Purpose of this technical report

This technical paper is one of a number of technical papers that form part of the EIS for the proposal.

The purpose of this technical paper is to identify and assess the potential impacts of the proposal in relation to potential economic impacts. It responds directly to the Secretary's environmental assessment requirements (SEARs) (refer to Section 1.4.1).

This report has the following objective:

- to assess the likely economic impacts of the development for the region and the State as a whole.

1.4.1 Secretary's environmental assessment requirements

The NSW Department of Planning, Industry and Environment (DPIE) has provided the SEARs for the EIS. The requirements specific to this assessment and where these aspects are addressed in this technical report are outlined in Table 1.1.

Table 1.1 Secretary's Environmental Assessment Requirements – Social and economic

Reference	Requirement	Section addressed
Key issues – Social and economic	Including an assessment of the likely social and economic impacts of the development (including the workers accommodation facility), for the region and State as a whole, including consideration of any increase in demand for community infrastructure and services	Section 3 for economic impacts for the region and the State as whole. Refer to Technical paper 6 (Social impact assessment) for matters relating to impacts to community infrastructure and services.

1.5 Structure of the report

This report is structured as follows:

- Section 1 provides an introduction to this assessment and overview of the proposal
- Section 2 provides an overview of the regional economy
- Section 3 assesses the economic impacts of the proposal on the region and the State
- Section 4 identifies measures to mitigate and manage economic impacts
- conclusions are provided in Section 5.

1.6 Limitations

The Economic Assessment is based on a number of assumptions about regional employment and regional procurement.

2 The Regional Economy

2.1 Introduction

The proposal traverses nine Local Government Area (LGA) in western NSW (refer to section 1.3.1). Consequently, for the purpose of this assessment the locality/region is defined as comprising these LGAs. This is the locality/region that has the potential to provide inputs to the proposal and derive economic benefits from the construction of the proposal.

2.2 Characterisation of the Region

2.2.1 Residents of the Region

Table 2.1 provides some characteristics of the usual residents of the nine LGAs comprising the regional economy based on the Australian Bureau of Statistics (ABS) 2016 Census of Population and Housing. In 2016, the region had a population of around 114,175 and a labour force of around 54,485, with the Wagga Wagga LGA comprising 55 per cent of the population and 58 per cent of the labour force. In 2016, there were 2,814 people identified as being unemployed with the majority (62 per cent) of these located in the Wagga Wagga LGA.

The main occupations of usual residents varied from LGA to LGA with the main occupation outside of Wagga Wagga LGA being *Managers* (which includes farm managers) and the main occupation in the Wagga Wagga LGA being *Professionals*.

Table 2.1 – Characteristics of Usual Residents

	Wentworth		Balranald		Murray River		Edward River		Hay		Murrumbidgee		Federation		Lockhart		Wagga Wagga		Total Region	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Demographics																				
Population	6,794		2,287		11,680		8,851		2,946		3,836		12,277		3,119		62,385		114,175	
Median Age	44		41		49		45		46		41		49		46		35			
In Labour Force	2,972	43.7%	1034	45.2%	5189	44.4%	4,012	45.3%	1,355	46.0%	1,793	46.7%	5,222	42.5%	1,345	43.1%	31,563	50.6%	54,485	47.7%
Unemployed	180	6.1%	55	5.30%	194	3.70%	200	5.0%	62	4.6%	80	4.5%	257	4.9%	54	4.0%	1,732	5.5%	2,814	5.2%
Median household weekly income	1,052		1174		1,061		1,080		1,075		1,197		1,017		1,114		1,354			
Unoccupied private dwellings	485	16.7%	248	23.40%	932	17.3%	472	12.3%	294	21.3%	361	21.1%	1,062	18.0%	188	14.2%	2,537	10.2%	6,579	
Median rent	160		150		200		185		150		150		200		150		265			
Occupations																			–	
Professionals	367	13.2%	83	8.5%	701	14.0%	553	14.6%	126	9.6%	157	9.1%	555	11.2%	164	12.7%	5,877	19.7%	8,583	17.0%
Managers	626	22.5%	216	22.2%	1205	24.1%	693	18.2%	253	19.4%	508	29.6%	870	17.5%	391	30.4%	3,634	12.2%	8,396	16.6%
Technicians and Trades Workers	356	12.8%	116	11.9%	627	12.6%	477	12.6%	179	13.7%	177	10.3%	741	14.9%	144	11.2%	4,667	15.6%	7,484	14.8%
Labourers	379	13.6%	195	20.0%	661	13.2%	546	14.4%	207	15.8%	276	16.1%	862	17.4%	130	10.1%	3,072	10.3%	6,328	12.5%
Community and Personal Service Workers	270	9.7%	95	9.8%	478	9.6%	409	10.8%	124	9.5%	143	8.3%	497	10.0%	122	9.5%	3,868	13.0%	6,006	11.9%
Sales Workers	232	8.3%	40	4.1%	414	8.3%	330	8.7%	108	8.3%	87	5.1%	441	8.9%	69	5.4%	3,061	10.3%	4,782	9.5%
Clerical and Administrative Workers	289	10.4%	104	10.7%	503	10.1%	449	11.8%	130	10.0%	182	10.6%	498	10.0%	130	10.1%	3,657	12.3%	5,942	11.7%
Machinery Operators and Drivers	213	7.6%	100	10.3%	323	6.5%	274	7.2%	152	11.6%	155	9.0%	412	8.3%	110	8.5%	1,327	5.5%	3,066	6.1%

Source: ABS, 2016 Census of Population and Housing, Community Profiles

The main industry sectors (4–digit) in which usual residents were employed in 2016 is provided in Table 2.2. Agricultural activities featured in all LGAs, apart from Wagga Wagga where service sectors dominated, reflecting the importance of this LGA as a regional service centre. For the total region, the most significant sectors were *Defence, Hospitals (except Psychiatric Hospitals), Supermarket and Grocery Stores, Aged Care Residential Services* and *Primary Education.*

Table 2.2 – Top 5 Industry Sectors of Employment for Usual Residents

Wentworth	**No.**	**%**	**Balranald**	**No**	**%**	**Murray River**	**No**	**%**	**Edward River**	**No.**	**%**	**Hay**	**No.**	**%**
Grape Growing	142	5.3	Grape Growing	61	6.4	Accommodation	191	3.9	Other Social Assistance Services	132	3.5	Sheep Farming (Specialised)	77	6.2
Citrus Fruit Growing	101	3.8	Sheep Farming (Specialised)	60	6.3	Other Grain Growing	164	3.4	Supermarket and Grocery Stores	112	3	Supermarket and Grocery Stores	59	4.7
Sheep Farming (Specialised)	86	3.2	Hospitals (except Psychiatric Hospitals)	41	4.3	Local Government Administration	161	3.3	Primary Education	107	2.9	Local Government Administration	57	4.6
Primary Education	80	3	Local Government Administration	39	4.1	Hospitals (except Psychiatric Hospitals)	155	3.2	Hospitals (except Psychiatric Hospitals)	99	2.6	Accommodation	45	3.6
Supermarket and Grocery Stores	68	2.5	Grain–Sheep or Grain–Beef Cattle Farming	34	3.6	Primary Education	136	2.8	Other Grain Growing	98	2.6	Primary Education	45	3.6

Murrumbidgee	**No.**	**%**	**Federation**	**No.**	**%**	**Lockhart**	**No.**	**%**	**Wagga Wagga**	**No.**	**%**	**Total Region**	**No.**	**%**
Other Grain Growing	184	11.1	Pig Farming	205	4.2	Grain–Sheep or Grain–Beef Cattle Farming	131	11.1	Defence	1,368	4.6	Defence	1,845	3.8%
Poultry Processing	68	4.1	Supermarket and Grocery Stores	181	3.7	Other Grain Growing	102	8.6	Hospitals (except Psychiatric Hospitals)	1,353	4.5	Hospitals (except Psychiatric Hospitals)	1,803	3.7%
Grain–Sheep or Grain–Beef Cattle Farming	64	3.9	Other Grain Growing	149	3.1	Sheep Farming (Specialised)	65	5.5	Higher Education	910	3.1	Supermarket and Grocery Stores	1,242	2.6%
Local Government Administration	61	3.7	Hospitals (except Psychiatric Hospitals)	147	3	Hospitals (except Psychiatric Hospitals)	53	4.5	Other Social Assistance Services	729	2.4	Aged Care Residential Services	1,154	2.4%
Sheep Farming (Specialised)	47	2.8	Aged Care Residential Services	146	3	Aged Care Residential Services	52	4.4	Secondary Education	706	2.4	Primary Education	1,103	2.3%

Source: Australian Bureau of Statistics, 2016 Census of Population and Housing, Community Profiles

An indication of the health of an economy can be gained from population changes. This theory of regional economic growth suggests that places that are able to attract population immigration create increased demand for goods and services and thus more jobs. This growth leads to increasing local multiplier effects, scale economies and an increase in the rate of innovation and capital availability (Sorensen, 1990). Conversely, population losses can contribute to a 'vicious cycle' of decline whereby reduced populations results in closure of services, which in turn makes it difficult to attract new populations (Sorensen, 1990).

Trends in regional economies as a result of globalisation and associated structural adjustment include:

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

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

Against this backdrop, it is evident that the population of the region has been growing, at a rate of 4.7 per cent since 2006, with this mainly reflecting growth in the Wagga Wagga and Murray River LGAs. The population of other LGAs has been relatively static or declining throughout this period.

Table 2.3 – Population Growth

	2006	2011	2016	Growth Rate 2006 – 2011	Growth Rate 2011 – 2016	Growth Rate 2006 – 2016
Wentworth	6,779	6,609	6,794	–2.5%	2.8%	0.2%
Balranald	2,441	2,283	2,287	–6.5%	0.2%	–6.3%
Murray River	10,779	10,919	11,680	1.3%	7.0%	8.4%
Edward River	9,106	8,660	8,851	–4.9%	2.2%	–2.8%
Hay	3,383	2,956	2,946	–12.6%	–0.3%	–12.9%
Murrumbidgee	4,145	3,757	3,836	–9.4%	2.1%	–7.5%
Federation	12,233	12,159	12,277	–0.6%	1.0%	0.4%
Lockhart	3,180	2,998	3,119	–5.7%	4.0%	–1.9%
Wagga Wagga	57,015	59,458	62,385	4.3%	4.9%	9.4%
Total Region	**109,061**	**109,799**	**114,175**	**0.7%**	**4.0%**	**4.7%**
NSW	**6,549,177**	**6,917,658**	**7,480,228**	**5.6%**	**8.1%**	**14.2%**

Source: Australian Bureau of Statistics, 2016 Census of Population and Housing, Community Profiles

2.2.2 Economic Activity in the Region

An indication of the nature of the regional economy can be gained by examining place of work employment by industry data (refer to Figure 2.1). This indicates the significance of the *Health Care and Social Assistance*, *Agriculture, Forestry and Fishing* and *Retail Trade* and sectors. For all LGAs apart from Edward River LGA and Wagga Wagga LGA, the *Agriculture, Forestry and Fishing* sectors are the main employment sectors. For Edward River LGA and Wagga Wagga LGA, Health Care and Social Assistance sectors are the main sectors.

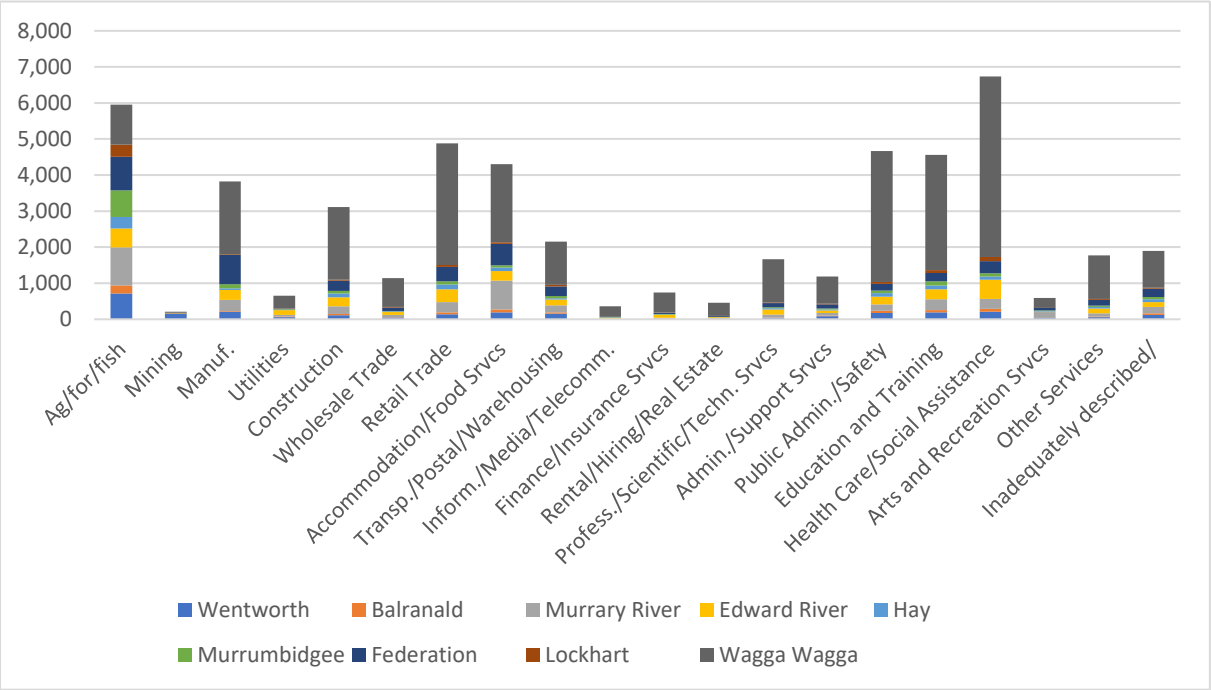

Figure 2.1 – Place of Work Employment (No.) by Industry (1 digit ANZSIC Sectors)

Source: Australian Bureau of Statistics, 2016 Census of Population and Housing, Working Population Profiles

An Input–Output (IO) table was prepared for the regional economy using the Generation of Regional Input Output Tables (GRIT) procedure developed by the University of Queensland and recognised internationally – Refer to Attachment 1. The Gross Regional Product (GRP) of the regional economy was estimated at $6,150 million for 2018/19.

The region is a net importer, with exports out of the region of $3,114 million and imports into the region of $5,940 million. Using the IO industry classifications, the largest exporting industries by output value are:

- *Sheep, Grains, Beef and Dairy Cattle ($661 million)*
- *Meat and Meat Products Manufacturing ($473 million)*
- *Basic Chemicals Manufacturing ($172 million)*
- *Basic Non–Ferrous Metal Manufacturing ($143 million)*
- *Accommodation ($120 million)*
- *Petroleum and Coal Product Manufacturing ($97 million)*

Exporting sectors are considered to be key drivers of regional economies and reflect a region's endowments and competitive advantages.

The following analysis uses the IO table data but reports the findings in terms of both the IO industry classifications and the Australian and New Zealand Standard Industrial Classification (ANZSIC) One–digit industry classification.

Using the IO industry classifications, in terms of value–added, it is estimated that *Defence; Sheep, Grains, Beef and Dairy Cattle; Health Care Services; Retail Trade; and Public Administration;* had the highest value added – in total, equal to approximately 27 per cent of the regional economy and 34 per cent of regional employment – Table 2.4.[1]

[1] Gross Value Added (GVA) measures the value of goods and services produced in a region.

Table 2.4 – Gross Value Added for the 5 Largest Industries in the Regional Economy (IO Sectors)

Industry	Gross Value Added ($m)	Proportion of Regional Economy (%)	Proportion of Regional Employment (%)
Defence	498	8%	4%
Sheep, Grains, Beef	454	7%	8%
Health Care Services	272	4%	8%
Retail Trade	268	4%	10%
Public Administration	260	4%	4%

Source: Gillespie Economics Input–Output Table

Based on the ANZSIC One–digit industry classification, in terms of value–added, it is estimated that *Public Administration and Safety; Rental, Hiring and Real Estate Services; Agriculture, Forestry and Fishing; Health Care and Social Assistance; and Manufacturing* had the highest value added – in total, equal to approximately 48 per cent of the regional economy and 45 per cent of regional employment – Table 2.5.

Table 2.5 – Gross Value Added for the 5 Largest Industries in the Regional Economy (ANZSIC One–Digit Sectors)

Industry	Gross Value Added ($m)	Proportion of Regional Economy (%)	Proportion of Regional Employment (%)
Public Administration and Safety	823	13%	10%
Rental, Hiring and Real Estate Services	644	10%	1%
Agriculture/Forestry/Fishing	623	10%	12%
Health Care and Social Assistance	511	8%	14%
Manufacturing	433	7%	8%

Source: Gillespie Economics Input–Output Table

3 Regional Economic Impacts

3.1 Introduction

The proposal would provide economic activity to the regional economy, primarily during construction. These regional economic impacts are assessed using IO analysis.

3.2 Input–Output Analysis

IO analysis essentially involves two steps:

- Construction of an appropriate IO table (regional transaction table) that can be used to identify the economic structure of the region and multipliers for each existing sector of the economy
- Identification of the direct impact or stimulus of the proposal, in a form that is compatible with the IO equations, so that the IO multipliers and flow–on effects for the impacts or stimulus of the proposal can then be estimated (West, 1993).

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

The consequence of the assumptions of IO analysis, is that IO modelling results provide an upper bound economic activity impact estimate.

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

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

3.3 Regional impacts

3.3.1 Introduction

The focus of the regional economic impact assessment is the economic activity that a project will bring to the regional economy. The proposal would have significant capital costs. Expenditure from the proposal construction that can potentially be captured by the region within which it is located arises from:

- non–labour inputs
- expenditure of wages by labour directly employed on the proposal.

3.3.2 Non–labour inputs

Non–labour inputs to the proposal would include, but not be limited to:

- plant and equipment (e.g. capacitors, line hardware, phase shift transformers, steel supply, power transformers etc)
- accommodation
- firms providing a range of services (e.g. catering, civil works, concrete provision, cranes hire, security services etc).

Plant and equipment are mainly from specialty manufacturing sectors that do not exist within the regional economy and hence would need to be imported to the region.

The proposal would be undertaken by a large and experienced contracting company. The companies that undertake these types of developments frequently centralise their purchasing activities in capital cities, including overseas; tend to have an existing suite of suppliers that they have worked with before; and also often impose strict prequalification requirements which small to medium sized regional businesses can find difficult and expensive to meet. Consequently, the majority of service inputs would potentially be sourced from outside the region.

Notwithstanding, the contractor will be adopting strategies to maximise local business input to production. A review of all the goods and services to be acquired for the proposal, and whether opportunities to supply the key goods and services are expected for Australia and the region, found that in the order of $159.4 million of goods and services over the 18-months of construction i.e. $106.2 million in year 1 and $53.1M in year 2, may be able to be provided by the region. The main sectors directly potentially benefiting over the 18 months of construction are identified in Table 3.1. This is the basis of the modelling of non–labour inputs.

Table 3.1 – Estimated Direct Expenditures in the Regional Community from the Proposal ($M)

Sectors	Total Non–Labour Expenditure ($M)	Year 1 Construction Non–Labour Expenditure ($M)	Year 2 Construction Non–Labour Expenditure ($M)
Heavy and Civil Engineering Construction	48.0	32.0	16.0
Construction Services	16.8	11.2	5.6
Rental and Hiring Services (except Real Estate)	15.6	10.4	5.2
Professional, Scientific and Technical Services	15.1	10.1	5.0
Transport Support services and storage	14.6	9.7	4.9
Cement, Lime and Ready-Mixed Concrete Manufacturing	9.6	6.4	3.2
Accommodation	9.5	6.4	3.2
Agriculture, Forestry and Fishing Support Services	6.4	4.2	2.1
Road Transport	4.3	2.8	1.4
Waste Collection, Treatment and Disposal Services	4.2	2.8	1.4
Building Cleaning, Pest Control and Other Support Services	3.7	2.5	1.2
Non Metallic Mineral Mining	3.6	2.4	1.2
Food and Beverage Services	2.1	1.4	0.7
Wholesale Trade	2.1	1.4	0.7
Employment, travel agency and other admin services	1.8	1.2	0.6
Electricity Transmission, Distribution, On Selling and Electricity Market Operation	0.8	0.5	0.3
Petroleum and Coal Product Manufacturing	0.8	0.5	0.3
Retail Trade	0.3	0.2	0.1
Gas Supply	0.1	0.0	0.0
Total	**159.4**	**106.2**	**53.1**

*Inconsistencies in totals are due to rounding.

3.3.3 Direct Labour inputs

The impact of the provision of direct employment in the region arises from:

- the additional wages spent in the region
- the ability of the regional economy to produce and provide the goods and services demanded by households.

The level of additional wages that are spent in the region depends initially on:

- where labour is sourced (which in turn depends on the location of labour that has the skills required for the proposal)
- where labour resides during the proposal while off shift.

The labour for the proposal may potentially be sourced from:

- the local region either from:
  - the unemployment pool
  - new entrants to the labour force
  - workers from other industries.
- outside the region with labour:
  - moving into the region to reside as a permanent resident during the employment period
  - commuting from outside the region e.g. Fly–in–fly–out (FIFO) and Drive–in–drive–out (DIDO) and remaining in the region as a visitor when 'off swing' (i.e. not working shifts)
  - commuting from outside the region e.g. FIFO and DIDO and returning home when 'off swing'.

Whether local labour is sourced from the unemployment pool, new labour force entrants or from other industries within the region, it can increase the level of wages in the region. The existence of job chain[2] effects means that whether employment is filled directly from the unemployment pool or from workers in other industries, the additional wages that accrue to the region approximates the difference between the wages in the new job and unemployment benefits. To the extent that the job chain effects is only partial, the additional wages in the region will be less than this. However, to the extent that the job chain effects reaches all the way to new participants in the labour force, the additional wages in the region will be greater than this.

Where labour is sourced from outside the region and migrates into the region to live, the additional wages in the region is equivalent to the full wages of the job.

The impact of commuting workers depends on the extent to which they spend money in the regional economy. However, generally commuting workers would repatriate most of their wages back to their home region. Therefore, a commuting workforce will invariably have a large leakage of wage and salary income away from the region in which they are working. This is particularly the case where the commuting workforce reside in a remote accommodation camp. Where this commuting workforce choose from time to time to temporarily stay in the region when off shift, to enjoy recreation and other activities in the region, some of the wages would be captured by the region.

[2] The job chain effect refers to the situation where labour is sourced from other industries in the region making jobs available in those industries which are subsequently filled by people either from the unemployment pool or other industries with the latter making jobs available in that industry, etc.

Not all wages that accrue to labour in a region are spent in a region. The amount of wage spending that is captured by a region would depend on its economic structure and the ability to provide the goods and services demanded by people. Generally, the smaller a region the greater the leakage of expenditure to other areas. Even where wages are spent in the region, unless goods are also manufactured in the region only the margins on sales would accrue to the region.

Notwithstanding, any additional local spending creates opportunities for businesses to expand and/or establish within the region to service the increased local demand.

The proposal is estimated by Transgrid to provide 500 full time equivalent (FTE) construction jobs in the region for the 18-month construction period. These would mainly be located in temporary accommodation camps, although local accommodation would also be utilised. Twenty percent of the jobs are estimated to be sourced from region, with the remainder sourced from the rest of Australia and overseas (such as for specific skills).

For the modelling of wage impacts the following assumptions are made:

- annual labour requirements for the proposal; construction, is estimated at 500 FTE construction workers, for a period of 18-months
- 20 per cent (approximately 100 FTE) of the labour force is sourced from the regional economy
- 80 per cent (approximately 400 FTE) of the labour force is sourced from the rest of Australia and overseas and leave the region between shifts
- the locally sourced labour is a mix of occupations and on average receives the mean employee income for the Wagga Wagga region i.e. $55,552 (ABS 2018, Regional data for Wagga Wagga LGA)
- with the consideration of job chain effects, the additional wage accruing to the region is the difference between the average wage for the Wagga Wagga region and unemployment benefits i.e. $39,411 per locally sourced person i.e. $3.9 million in total.
- wages are spent in accordance with the average pattern of household expenditure given by the household sector in the regional input–output table.

3.3.4 Impact estimate

The regional economic impacts of the assumed levels of non–labour and labour expenditure are provided in Tables 3.2 and 3.3, respectively, for year 1 (a full year) of construction. Impacts in year 2 (6-months of construction) would be half those of year 1.

Table 3.2 – Annual direct and indirect impact of non–labour expenditure in the region for year 1 (a full year) of construction

	Direct Effect	Production Induced	Consumption Induced	Total Flow–on	TOTAL IMPACT
OUTPUT ($M)	106.2	30.8	21.5	52.3	158.6
Type 11A Ratio	1.00	0.29	0.20	0.49	1.49
VALUE–ADDED ($M)	44.6	13.2	12.6	25.8	70.4
Type 11A Ratio	1.00	0.30	0.28	0.58	1.58
INCOME ($M)	23.1	7.5	4.8	12.3	35.5
Type 11A Ratio	1.00	0.33	0.21	0.53	1.53
EMPLOYMENT (No.)	357	114	101	214	571
Type 11A Ratio	1.00	0.32	0.28	0.60	1.60

Table 3.3 – Annual flow-on impact of local employee expenditure in the region for year 1 (a full year) of construction

	Direct Effect	Production Induced	Consumption Induced	Total Flow–on	TOTAL IMPACT
OUTPUT ($M)	2.4	0.5	0.5	1.0	3.4
Type 11A Ratio	1.00	0.20	0.20	0.40	1.40
VALUE–ADDED ($M)	1.4	0.2	0.3	0.5	1.9
Type 11A Ratio	1.00	0.15	0.19	0.35	1.35
INCOME ($M)	0.6	0.1	0.1	0.2	0.8
Type 11A Ratio	1.00	0.19	0.19	0.37	1.37
EMPLOYMENT (No.)	13	2	2	4	17
Type 11A Ratio	1.00	0.14	0.17	0.31	1.31

The total economic impact of the non–wage expenditure ($106.2 million) in the regional economy during year 1 (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 year 1 (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.

Hence, total annual employment generated by the proposal during year 1 of construction for people that live permanently in the region is estimated at 698 i.e. 100 direct jobs, 17 jobs from wage expenditures and 571 jobs from non-labour expenditure.

3.4 NSW impacts

The economic activity generated by the proposal for NSW would be greater than that reported for the region because:

- the NSW economy is larger than the regional economy and therefore more able to provide the direct inputs to production and labour required for the proposal i.e. less leakages; and
- there is a greater level of linkages in the NSW economy than the regional economy and hence multiplier effects would be larger.

However, the main economic effect for the NSW relates to its contribution to the provision of secure and reliable electricity in the near term, while facilitating the longer–term transition across the National Electricity Market to low–emission energy sources. A cost–benefit analysis prepared as part of the Regulatory Investment Test for Transmission (RIT–T) process for the Australian Energy Regulator (AER) shows that the new interconnector is expected to deliver net market benefits of around $900 million over 21 years (in present value terms) (Transgrid, 2020). Part of these net benefits would accrue to NSW.

4 Mitigation and Management Measures

It is evident from Section 3 that construction of the proposal would provide positive economic activity to the regional economy.

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

- promotion of local workforce participation via the preparation and implementation of a Local Industry Participation Plan and Australian Industry Participation Plan;
- collaborating with the local Councils, economic development organisations, local chambers of commerce and State Government to:
  - inform local business of the goods and services required of the proposal, the service provision opportunities and compliance requirements of business to be able to secure contracts
  - encourage local business to meet the requirements of the proposal for supply contracts
  - develop relevant networks to assist qualified local and regional businesses tender for provision of goods and services to support the proposal.

5 Conclusion

The proposal would provide economic activity to the regional economy (comprising of nine western NSW LGAs), particularly during the 18-month construction phase. This economic activity in the regional economy arises from:

- expenditure on non–labour inputs to production
- direct employment of local labour
- expenditure of local labour wages in the local economy.

The total economic impact of the non–wage expenditure ($106.2 million) in the regional economy during year 1 (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 year 1 (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.

Hence, total annual employment generated by the proposal during year 1 of construction for people that live permanently in the region is estimated at 698 i.e. 100 direct jobs, 17 jobs from wage expenditures and 571 jobs from non-labour expenditure.

The economic activity generated by the proposal for NSW will be greater than that reported for the region.

However, the main economic effect for NSW relates to its contribution to the provision of secure and reliable electricity in the near term, while facilitating the longer–term transition across the NEM to low–emission energy sources. A cost–benefit analysis prepared as part of the RIT–T process for the Australian Energy Regulator (AER) shows that the new interconnector is expected to deliver net market benefits of around $900 million over 21 years (in present value terms). Part of these net benefits would accrue to NSW.

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

The Generation of Regional Input–Output Tables (GRIT) system was designed to:

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

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

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

Table A1.1

The GRIT Method

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

Source: Bayne and West (1988).

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

1. "The *basic assumptions* in IO (input-output) analysis include the following:

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

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

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

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

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

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

Multipliers indicate the total impact of changes in demand for the output of any one industry on all industries in an economy (ABS, 1995). Conventional output, employment, value–added and income multipliers show the output, employment, value–added and income responses to an initial output stimulus (Jensen and West, 1986).

Components of the conventional output multiplier are as follows:

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

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

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

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

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

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

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

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

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

A description of the different ratio multipliers is given below.

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

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

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

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

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