

NEED/OPPORTUNITY STATEMENT (NOS)



Support South Western NSW for Renewables

NOS- 000000001746 revision 0.0

Ellipse project no(s):
TRIM file: [TRIM No]

Project reason: Economic Efficiency - Network developments to achieve market benefits
Project category: Prescribed - Augmentation - Contingent

Approvals

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Date submitted for approval	12 January 2017	

1. Background

This Need/Opportunity statement documents the triggers, limitations and needs for the TransGrid’s South Western NSW network as a result of anticipated renewable energy connections in the area.

If Need 1570 is addressed then this need is not required as the scope of Need 1570 includes the issues and solutions specific to this.

The existing transmission network for the NSW South Western area (west of Wagga) is shown in Figure 1.

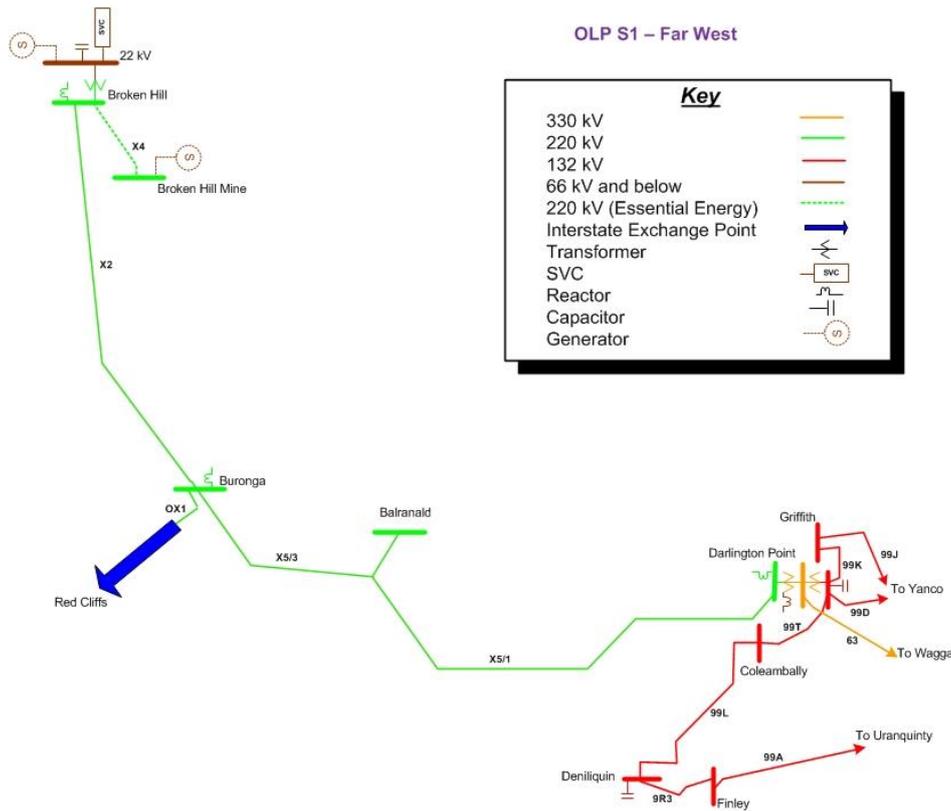


Figure 1: Existing System to the West of Wagga

Table 1 shows the lines and their rating information relevant to this area of the network.

Line No.	Line Name	Line Voltage (kV)	Normal Rating (MVA)	Conductor Rating (MVA)	Design Temp (°C)
63	Wagga – Darlington Point	330	569	915	85
X5/1	Darlington Point – Balranald	220	301	419	85
X5/3	Balranald - Buronga	220	227	419	85
X2	Buronga – Broken Hill	220	95	419	85

Table 1: Line List

2. Need/Opportunity

2.1 Assessment of Generation Capacity

AEMO's generation information reports were a key input to select the generation retirement options. In particular, both Liddell and Smithfield are noted by AEMO to be "committed" to retirement. AEMO states that Smithfield Power Partnership advised them that the Smithfield energy facility would be retired in 2017 and AGL advised that Liddell power station would be shut down in 2022.

The reserve plant margins and energy balances within NSW will be heavily impacted by the retirement of Liddell. The ability of NSW existing generation to meet demand was assessed based on the following assumptions:

- NSW 10% POE medium demand growth forecast¹
- The full capacity of all existing coal, gas and hydro generations is available for dispatch
- Maximum interconnector import capacity (1200 MW import from Queensland, 600 MW import from Victoria)
- Network losses are assumed to be 4% of the maximum demand level

The generator retirements assumed are:

- Smithfield generator with total capacity 162 MW in 2017
- Liddell power station with total capacity 2000 MW in 2022.

The NSW demand, available generation and potential surplus / shortfall is summarised in Table 2. A shortfall in generation is observed in 2022 as a result of the retirement of Liddell Power Station.

Year	Demand (MW)	Total Generation (MW)	Total Interconnector Flow (MW)	Network Losses (MW)	Surplus / Shortfall (MW)
2019/20	14666	15079.8	1800	600	1613.8
2020/21	14887	15079.8	1800	600	1392.8
2021/22	15086	15079.8	1800	600	1193.8
2022/23	15219	13079.8	1800	600	-939.2
2023/24	15457	13079.8	1800	600	-1177.2
2026/27	16168	13079.8	1800	600	-1888.2
2028/29	16591	13079.8	1800	600	-2311.2

Table 2: NSW Generation Surplus / Shortfall Based on Existing Generations for the Medium Growth Demand Scenario

Based on the assessment, it can be concluded that after the retirement of Liddell power station, NSW existing local generation with full interconnector support from other states will not be able to meet NSW demand. To meet the reliability of supply, new generation or interconnector upgrade will be required.

¹ AEMO National Electricity Forecasting Report 2015

AEMO also suggests in their 2015 Electricity Statement of Opportunities (ESOO) report that the unserved energy (USE) level in NSW could exceed the Reliability Standard from 2021 under the high scenario and from 2022 under the medium scenario as shown in Figure 2. The increase in USE is primarily driven by the capacity withdrawal from NSW and an increase in maximum demand.

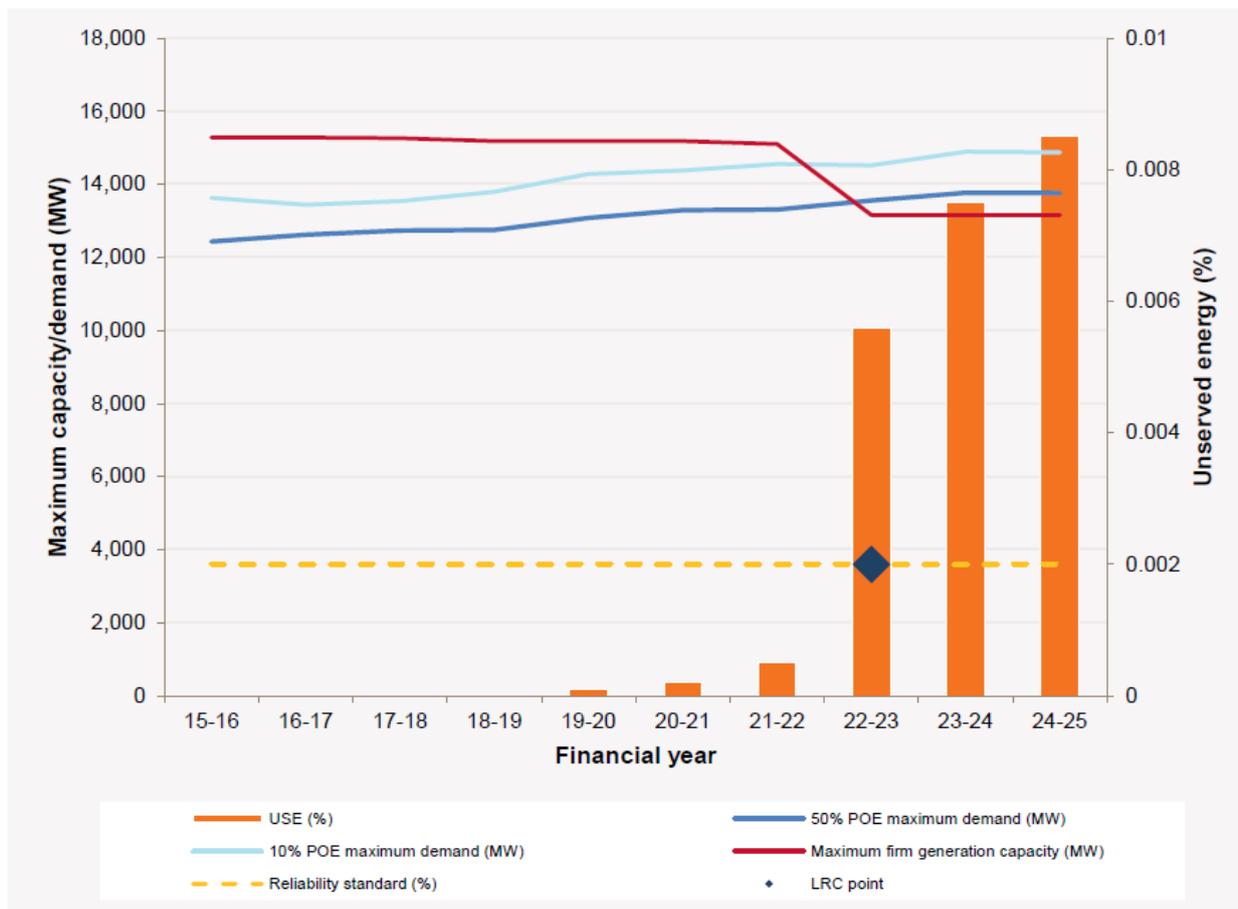


Figure 2: NSW Supply Adequacy (Medium Scenario)²

However, generation scenarios identified by Ernst & Young³ for TransGrid indicate that there is potential for new generation in NSW that would cater for existing generation retirements. Among these potential new generation connections in NSW, over 1000 MW new generation connections are proposed in the South Western NSW area (west of Wagga in Figure 1 above). However, as described in the proceeding sections, this new renewable generation along with import from Victoria could be constrained due to transmission system limitations west of Wagga.

² 2015 Electricity Statement of Opportunities Version 2.0

³ Refer to report "Generation Development Scenarios for TransGrid's 2018/19 to 2023/24 Revenue Proposal Request by Ernst & Young"

2.2 Possible Renewable Developments

Some of the potential wind and solar connections in the NSW South Western area are listed below.

Renewable Connection	Capacity (MW)
[REDACTED]	[REDACTED]

Table 3: Potential Renewable Generators

2.3 Description of Need/Opportunity

2.3.1 Need/opportunity contingent on the New Generator Connections

In the event these generator connections eventuate, it’s possible that the output of these renewable generators would be constrained due to the limited capacity of the transmission network in the South Western NSW. These transmission limitations include,

- Transmission capacity (thermal) limitations between Buronga and Broken Hill
- Transmission capacity (thermal) limitations between Buronga and Darlington Point
- Transmission capacity (thermal) limitations between Darlington Point and Wagga
- Voltage control issues in the South Western transmission network

Therefore reinforcing the transmission network in this area (west of Wagga) would contribute in addressing any potential supply shortages in NSW following the retirement of Liddell power station. In addition, such reinforcements that will allow additional renewable generation to the system will provide market benefits to NSW as well as National Electricity Market (i.e. reduced energy cost by dispatch of lower cost generating plant, increased competition of generators etc.).

2.3.2 TransGrid proposes this project as a contingent project with the following triggers:

- > New generation more than 400 MW⁴ is committed in South Western NSW (west of Wagga)⁵; and/or
- > New generation in North West Victoria⁶
 - exceeding 800 MW for connection to the Ballarat – Waubra – Ararat – Horsham 220 kV Lines or connection point(s); and/or
 - exceeding 200 MW for connection to the Redcliffs – Weman – Kerang 220 kV Lines or connection point(s); and/or
 - exceeding 500 MW for connection to the Ballarat – Terang – Moorabool 220 kV Lines or connection point(s); and/or
 - exceeding 1,500 MW in the North West Victoria zone
- > Successful completion of a RIT-T, either by TransGrid for South West NSW or AEMO for North West Victoria, demonstrating positive net market benefits with an augmentation of the transmission network south-west of Wagga identified as the preferred option or part of the preferred option.
- > Determination by the AER under clause 5.16.6 of the NER that the proposed investment satisfies the RIT-T.
- > TransGrid Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules.

2.4 Indicative Date to Address Need

The indicative date would be determined by construction of renewable energy sources in South Western NSW.

2.5 Type of Service

The system reinforcement would be prescribed service.

3. Related needs/opportunities

- Need ID 1698 – Strengthening Far West Network
- Need ID 1528 – Reinforcement of Southern Network
- Need ID 1570 – Reinforcement of South Western Network for NSI
- Need ID 1649 – Reliability of Supply to Broken Hill

⁴ Based on the contingency rating of Line X5

⁵ AEMO classification of generation developments as being at the 'committed' stage of development on their 'Generator Information' webpage at <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information>

⁶ AEMO classification of generation developments as being at the 'committed' stage of development on their 'Generator Information' webpage at <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information>

4. Recommendation

It is recommended that options including all feasible network and non-network be considered to address the identified need/opportunity.