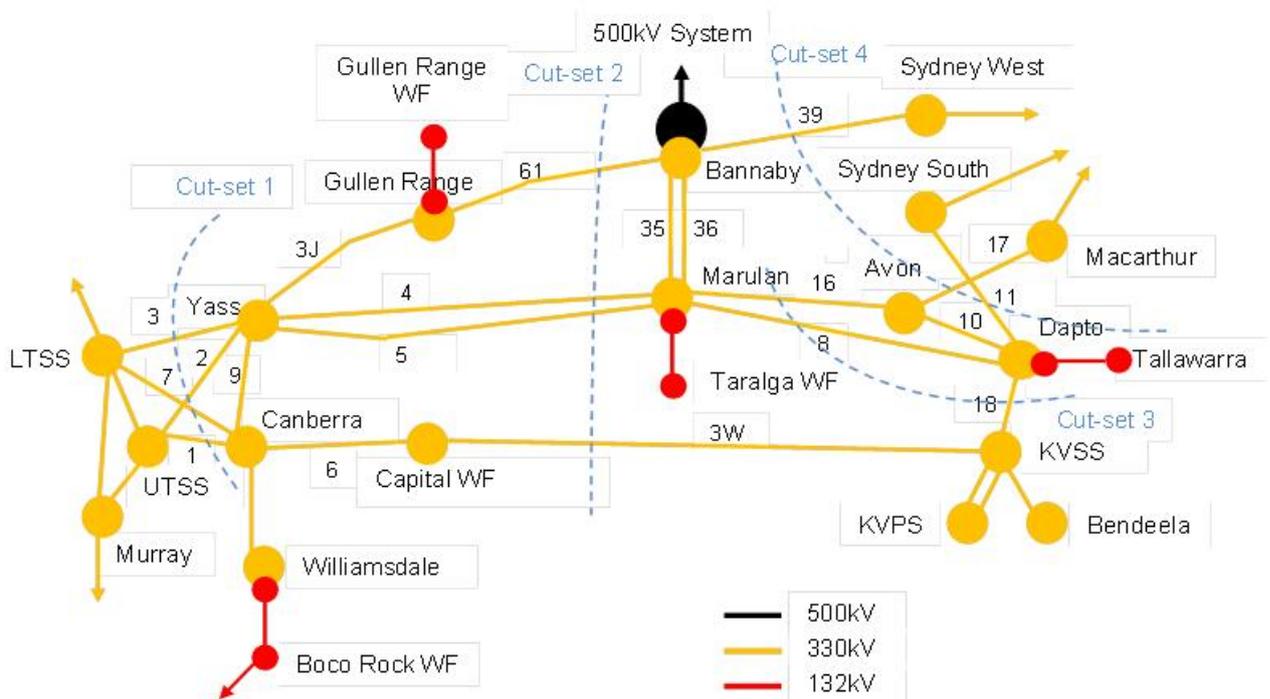


5.5.1.2 Reinforcement of Southern Network

1.1. Background

There are a lot of uncertainties in the future generation availability in NSW. There are potentially over 3,000 MW of new generation connections in NSW as well as potentially over 2,000 MW of existing generation retirements (from Smithfield and Liddell power station¹) in NSW. Among these potential new generation connections in NSW, 2,000 MW of new generation connections are proposed in the Southern NSW area² (south of cut-set 2 in Figure below). Some of this new generation has recently been commissioned³ or is at an advanced design stage, and further new generation is forecast to be commissioned towards the end of the present regulatory control period.



TransGrid engaged Ernst & Young to develop generation outlook scenarios for the period 2018/19 to 2022/23. The generation scenarios identified by Ernst & Young⁴ indicate that there is potential for new generation in NSW that would cater for existing generation retirements. However, system adequacy studies indicate that new southern generation along with import from Snowy and interconnections could be constrained due to transmission system limitations, in particular in the Snowy to Sydney area. Consequently, contingent on the new generation connections, there could be opportunity to provide market benefits to consumers, through lower wholesale energy prices, through reinforcing the transfer capability of the Snowy to Sydney transmission corridor.

¹ AEMO's generation information report <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information>

² Southern NSW is defined by the area bounded by the generation that feeds to TransGrid's substation in Yass, Canberra, Kangaroo Valley, Marulan and Bannaby.

³ For example, in the south Royalla Solar Farm and in the north Moree Solar Farm have progressively commissioned since 2014.

⁴ Refer to RIN supporting document "TransGrid - Ernst and Young - Report to TransGrid on load developments - 1016 - PUBLIC"

1.2. Project Description

Given the uncertainties presently around generation developments, decommissioning, mothballing and re-powering, it is difficult to predict what would be the most opportune time to commit to transmission capacity augmentation. However, it is probable that market benefits may be accrued from 2019 onwards.

TransGrid considers that the project should be accepted as a contingent project for the 2019-2023 regulatory period because of the uncertainty about the trigger events occurring and the scope and cost of the project.

1.3. Trigger Event

The proposed triggers for this contingent project are:

- New generation of more than 350 MW is committed in southern NSW at any current or future connection point(s) south of Bannaby and Marulan⁵ or NSW import capacity from Southern Interconnectors is determined to be increased by more than 350 MW due to committed expansion of southern interconnections
- Successful completion of the RIT-T which will be initiated in the event of occurrence of any of the above triggers, including a comprehensive assessment of credible options demonstrating positive net market benefits
- 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.

The triggers are specific and capable of objective verification, relate to a specific location or locations, and are probable but too uncertain to include the proposed contingent project in the ex-ante capital expenditure forecast.

1.4. Project Requirement

A range of transmission capacity augmentation options were identified and considered to meet or partly meet the identified needs at different stages, including upgrade of existing transmission lines, construction of new transmission lines and generation runback and load curtailment. However, both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time and depend on the outcome of the RIT-T.

Options identified (including scope of work) are:

Moderate 330kV line upgrade

Upgrading the following 330kV transmission lines to an operating temperature of 120°C.

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>

- 3J Yass – Gullen Range
- 61 Gullen Range – Bannaby
- 4 Yass – Marulan
- 5 Yass – Marulan
- 18 Kangaroo Valley – Dapto
- 39 Bannaby – Sydney West
- 9 Canberra – Yass

Staged line upgrade, phase shifting transformer installations and new line

Stage 1:

- Upgrade the 330kV Upper Tumut to Canberra 01 Line to an operating temperature of 120°C
- Replacement of the 01 Line switchbay wave traps at Upper Tumut
- Replacement of the 01 Line indication ammeter at Upper Tumut
- Upgrade the 330kV Bannaby to Sydney West 39 Line to an operating temperature of 120°C

Stage 2:

- Upgrade the 330kV Yass to Marulan 4 Line to an operating temperature of 100°C
- Upgrade the 330kV Yass to Marulan 5 Line to an operating temperature of 100°C
- Establishment of new switchyard bench and installation of 330kV 1200MVA phase shifting transformers on 39 and 61 lines at Bannaby
- Relocation of the 4/5 Line double circuit tower X4 (first structure out of Marulan)
- Extension of the switchyard bench and installation of a 330kV 1200MVA phase shifting transformer on 5 line at Marulan

Stage 3:

- Construction of a new 330kV single circuit line between Yass and Bannaby with twin Olive conductor at an operating temperature of 120°C
- Installation of 330kV line switchbays at Yass and Bannaby
- Upgrade terminal equipment for Line 11 at Sydney South and Dapto to achieve a summer day rating of 1370MVA
- Upgrade terminal equipment for Line 17 at Avon and Macarthur to achieve a summer day line rating of 1357MVA

Generation runback and load curtailment

- Runback generation south of Yass/Canberra
- Load curtailment north of Bannaby

330kV line upgrade / rebuild using high temperature conductors

- 3J Yass – Gullen Range
- 61 Gullen Range – Bannaby

- 4 Yass – Marulan
- 5 Yass – Marulan
- 18 Kangaroo Valley – Dapto
- 39 Bannaby – Sydney West
- 9 Canberra – Yass

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time. If the trigger events occur, the proposed contingent project would be reasonably required to meet the NER capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services.

1.5. Contingent Capital Expenditure

The preferred option will be identified based on the outcome of the RIT-T process, which will take place in the event this contingent project is triggered. However, the likely preferred option is the staged line upgrade, phase shifting transformer installations and new line. The capital expenditure is shown below.

For Stage 1, the estimated cost is \$18.3 million.

For Stage 2, the estimated cost is \$122.2 million.

For Stage 3, the estimated cost is \$122.0 million.

The total estimated cost for this contingent project is \$262.5 million (June 16) or **\$291 million (Nominal)**.

TransGrid notes that, by definition, it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. In accordance with clause 6A.8.2(b)(3), a detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

Consistent with clause 6A.8.1(b)(iii) of the NER, the estimated contingent capital expenditure exceeds the applicable contingent project threshold of the larger of either \$30 million or \$40 million.⁷

This project is subject to a positive net economic benefit confirmed through RIT-T.

1.6. Demonstration of Rules Compliance

TransGrid considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the NER as:

⁷ This represents 5% of the value of the maximum allowed revenue for the first year of the regulatory control period.

5.

- (a) it is reasonably required to achieve the capital expenditure objectives as set out in 1.4 above;
- (b) it is not otherwise provided for in the total forecast capital expenditure;
- (c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;
- (d) it exceeds the contingent project threshold as set out in 1.5 above;
- (e) it complies with the requirements of the Submission Guidelines; and
- (f) it has an appropriately defined trigger event as set out in 1.3 above.