TransGrid

Summary: Improving stability in south-western NSW

RIT-T – Project Specification Consultation Report

Region: South Western New South Wales

Date of issue: 31 July 2020

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Summary

TransGrid is applying the Regulatory Investment Test for Transmission (RIT-T) to options for improving stability in the south-western New South Wales (NSW) power system. Publication of this Project Specification Consultation Report (PSCR) represents the first step in the RIT-T process.

The main power system in south-western NSW consists primarily of one 330 kV transmission line from Darlington Point to Wagga Wagga (Line 63) and 220 kV transmission lines west of Darlington Point (including Line X5). Smaller underlying 132 kV transmission lines supply regional towns.

This area has seen significant growth in renewable connections to the transmission network as part of the wider energy market transition. Approximately 560 MW of renewable generation has connected in the area since December 2015, with a further 800 MW expected to connect by 2021. This is having an impact on how this part of the power system operates. In particular, while power has historically primarily flowed west from Darlington Point to supply rural and mine loads, this is expected to reverse with the increase in renewable generation in the area, particularly during daytime when there is an abundance of solar generation.

These changes in power flows are expected to lead to an increasing risk of power system instability going forward. Currently, the only way of managing this risk is to constrain generation in south-western NSW. In recognition of the risks to future power system stability, the Australian Energy Market Operator (AEMO) recently implemented an operational constraint in the NEM Dispatch Engine (NEMDE) to limit power flows and prevent this occurring.

TransGrid has identified the opportunity to strengthen the transmission network to relieve this constraint and realise net market benefits. This RIT-T has therefore been initiated to progress and consult on the assessment of investment options. The investments considered in this RIT-T are not expected to form part of AEMO's final 2020 Integrated System Plan (ISP), and so are being progressed outside of the ISP framework.

TransGrid's revenue determination for the 2018-2023 regulatory control period includes a contingent project to support South Western NSW for renewables. This contingent project is to reinforce the transmission network in the area to enable additional renewable generation and provide net market benefits to NSW as well as the wider National Electricity Market.[1]

The 'identified need' is to provide net benefits to the market through relieving the recently imposed generation constraint in the south-western NSW power system

The identified need for this RIT-T is to increase overall net market benefits in the National Electricity Market (NEM) through relieving existing and forecast constraints on generation connecting to the transmission network in south-western NSW. Doing so will enable greater output from renewable generation in this region of the NEM.

Within the context of the RIT-T assessment, greater output from renewable generation is expected to deliver market benefits primarily through:

- reductions in total dispatch costs (including fuel costs), by enabling low cost renewable generation to displace higher cost conventional generation elsewhere; and
- reducing the need for new investment in generating plant, or a deferral of generation investment.

It is expected that the market benefits from relieving these constraints will exceed the cost of doing so.

[1] TransGrid, *Revised Regulatory Proposal 2018/19-2022/23*, available at: https://www.aer.gov.au/system/files/TransGrid%20-%20Revenue%20Proposal%2018_19%20to%2022_23%20-%20January%202017.pdf

Three types of credible options have been identified

TransGrid considers there are three types of credible options that have the potential to meet the identified need from a technical, commercial, and project delivery perspective.

These options cover:

> a new or rebuild transmission line between Darlington Point and the new Dinawan substation being constructed for EnergyConnect (Option 1A (new line) and Option 1B (rebuild));
> a new transmission line between Darlington Point and Wagga Wagga (Option 2); and
> a static synchronous compensator (STATCOM) solution (Option 3).

Table 1 summarises the credible options TransGrid proposes be assessed in the Project Assessment Draft Report (PADR).

TransGrid notes that a STATCOM solution may not be able to relieve the constraint in full, due to the fast-acting nature of voltage collapse and the low system strength in the area. The benefits from this option are therefore likely to be less than those for the network options. Whether this option remains a credible option (or becomes non-economic) will be evaluated as part of the PADR.

Section 4 of this PSCR provides detail on the technical characteristics that a non-network solution would need to have in order to assist with meeting the identified need for this RIT-T. TransGrid would be interested in hearing from proponents that provide these solutions.

Table 1: Summary of the credible options, $2019-20

Option	Description	Estimated capital cost	Expected delivery time
1A	Establish a new Darlington Point to Dinawan 330 kV transmission line	$145-225 million	4-5 years
1B	Rebuild the existing 99T Darlington Point to Coleambally and 99L Coleambally to Deniliquin as 330 kV to Dinawan	$180-280 million	4-5 years
2	Establish a new Wagga Wagga to Darlington Point 330 kV transmission line	$220-340 million	4-5 years
3	STATCOM	$30-50 million for a 100 MVar STATCOM	3-4 years

All options are assumed at this stage to have annual operating and maintenance costs equal to approximately one per cent of their capital costs. However, TransGrid is continuing to investigate these costs for each option and expects to report more detailed estimates in the PADR.

Wholesale market modelling reflecting the 2020 ISP assumptions will be used to identify the preferred option

Given that the benefits of the investments considered in this RIT-T relate to reduced constraints on generation, TransGrid intends to adopt market modelling in identifying the preferred option.

Given the long-lived nature of transmission investments, it is important that the outcome of the RIT-T assessment is robust to different assumptions about how the energy sector may develop in the future.

Uncertainty is captured under the RIT-T framework through the use of scenarios, which reflect different assumptions about future market development and other factors that are expected to affect the relative market benefits of the options being considered.

TransGrid intends to model the market benefits of the credible options across three 'core' scenarios using wholesale market modelling in the PADR. These scenarios will be based on those used by AEMO in the forthcoming 2020 ISP and will reflect a sufficiently broad range of potential outcomes across the key uncertainties that are expected to affect the future market benefits of the investment options being considered.

TransGrid also plans to investigate a range of sensitivity tests on key assumptions in the PADR to further test the robustness of the preferred option to the underlying assumptions. These may be informed by submissions to this PSCR.

Submissions and next steps

The purpose of this PSCR is to set out the reasons TransGrid proposes that action be undertaken, present the options that address the identified need, outline the technical characteristics that non-network options would need to provide, and allow interested parties to make submissions and provide input to the RIT-T assessment.

TransGrid welcomes written submissions on the material contained in this PSCR. Submissions are particularly sought on the credible options presented and from potential proponents of non-network options that could meet the technical requirements set out in this PSCR. Submissions are due on 26 October 2020.

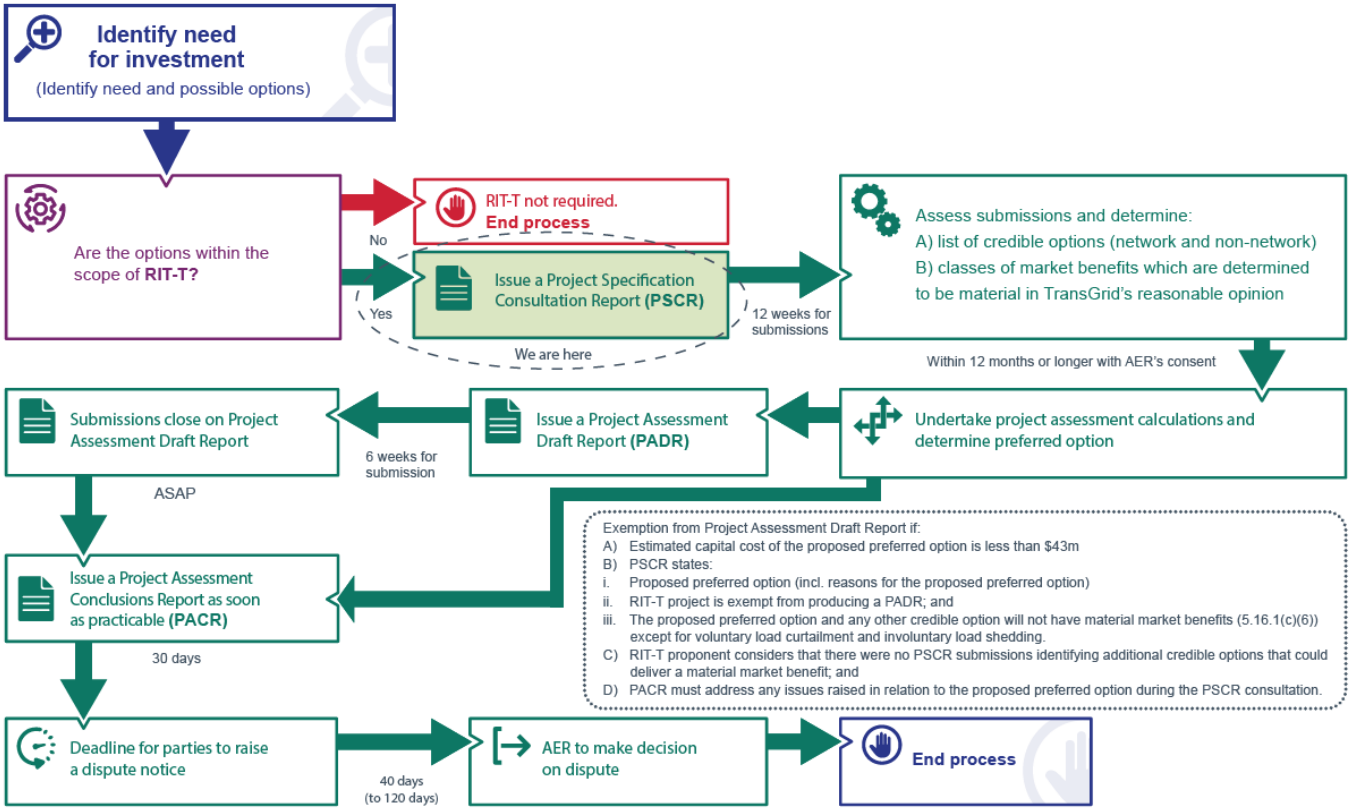
Submissions should be emailed to TransGrid's Regulation team via regulatory.consultation@transgrid.com.au.[2] In the subject field, please reference 'PSCR Improving stability in south-western NSW.'

At the conclusion of the consultation process, all submissions received will be published on the TransGrid's website. If you do not wish for your submission to be made public, please clearly specify this at the time of lodgement.

The next formal stage of this RIT-T is the publication of a PADR. The PADR will include the full quantitative analysis of all credible options and is expected to be published in late 2020.

[2] TransGrid is bound by the Privacy Act 1988 (Cth). In making submissions in response to this consultation process, TransGrid will collect and hold your personal information such as your name, email address, employer and phone number for the purpose of receiving and following up on your submissions. If you do not wish for your submission to be made public, please clearly specify this at the time of lodgement. See section 1.2 for more details.

Figure 1: This PSCR is the first stage of the RIT-T process[3]



To read the full Project Specification Consultation Report visit TransGrid's website.

[3] AER, *Final determination on the 2018 cost thresholds review for the regulatory investment tests*, available at: https://www.aer.gov.au/communication/aer-publishes-final-determination-on-the-2018-cost-thresholds-review-for-the-regulatory-investment-tests