Summary: Maintaining reliable supply to Bathurst, Orange and Parkes areas

RIT-T – Project Specification Consultation Report

Region: Central West New South Wales

Date of issue: 17 March 2021

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Summary

TransGrid is applying the Regulatory Investment Test for Transmission (RIT-T) to options for maintaining reliable supply to the Bathurst, Orange and Parkes areas of Central West New South Wales (NSW). Publication of this Project Specification Consultation Report (PSCR) represents the first step in the RIT-T process.

As set out in our 2020 Transmission Annual Planning Report (TAPR), the latest demand forecasts indicate that electricity demand is expected to increase substantially in the Bathurst, Orange and Parkes areas going forward.[1] This is mainly due to expected demand growth of some existing large mine loads in the area, the planned connection of new mine/industrial loads and general load growth around Parkes, including from the NSW Government's Parkes Special Activation Precinct (SAP).[2]

TransGrid's power system studies forecast that the expected load growth in the Bathurst, Orange and Parkes areas will reach voltage stability and thermal limits of the 132 kV supply network in the Central West area if action is not taken.

This RIT-T examines network and non-network options for relieving these constraints going forward to ensure compliance with the requirements of the NER and provide the greatest net benefit to the market.

The 'identified need' is to provide reliable supply to Central West NSW in light of the significant projected load growth

Schedule 5.1.4 of the NER requires TransGrid to plan and design equipment for voltage control to maintain voltage levels within 10 per cent of normal voltage.[3] The NER also requires the power system to be operated in a satisfactory operating state, which requires voltages to be maintained within these levels, both in normal operation and following any credible contingency event.[4]

TransGrid undertook planning studies that show that the current Central West network will not be capable of supplying the combined increases in load in the area without breaching the NER requirements and that voltage-limited constraints will have to be applied in the 132 kV supply network if action is not taken.

Moreover, in addition to the longer-term voltage constraints identified, our planning studies show that the increased demand will also lead to thermal constraints in the Central West region of NSW, particularly during times of low renewable generation dispatch in the region.

If the longer-term constraints associated with the load growth in the Bathurst, Orange and Parkes areas are unresolved, it could result in the interruption of a significant amount of electricity supply under both normal and contingency conditions due to voltage and thermal limitations in the area.

TransGrid has therefore commenced this RIT-T to assess options to ensure the above NER requirements continue to be met in Central West NSW with forecast demand increases.

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1 TransGrid, *2020 Transmission Annual Planning Report*, p. 40, available at: https://www.transgrid.com.au/what-we-do/Business-Planning/transmission-annual-planning/Documents/2020%20Transmission%20Annual%20Planning%20Report.pdf

2 https://www.nsw.gov.au/snowy-hydro-legacy-fund/special-activation-precincts/parkes-special-activation-precinct

3 These levels are specified in Clause S5.1a.4.

4 These requirements are set out in Clauses 4.2.6, 4.2.4 and 4.2.2(b) of the NER. The requirement for secure operation of the power system in Clause 4.2.4 requires the power system to be in a satisfactory operating state following any credible contingency event, that is, to maintain voltage within 10 per cent of normal voltage following the first credible contingency event.

TransGrid considers this a 'reliability corrective action' under the RIT-T as the proposed investment is for the purpose of meeting externally-imposed regulatory obligations and service standards, i.e., Schedule 5.1.4 of the NER.

Four types of credible network options have been identified

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

Each of the credible network options outlined in this PSCR requires a new 330/132 kV substation near Orange and a 132 kV line to Orange North to provide the required supply capacity to meet the forecast load growth in Bathurst, Orange and Parkes areas. While the expected timing of this new substation differs between options and scenarios, on account of the interaction with the other option components, TransGrid expects that this substation will be included in each option at some point in the assessment period. This new substation near Orange and 132 kV line to Orange North is estimated to cost between $162 million and $198 million.

Aside from the new 330/132 kV substation near Orange, the credible network options differ by where, how and when new capacity is added to the Central West region in the near-term. In particular, TransGrid currently considers there to be four broad types of credible option, which cover:

- a new 132 kV line between Orange and Parkes;
- a new 330 kV line between Orange and Parkes;
- dynamic reactive support at Orange and Parkes for as long as it can meet forecast demand, following which a new 132 kV line between Orange and Parkes is required; and
- batteries to provide both load reduction and dynamic reactive support, following which a new 132 kV line between Orange and Parkes is required.

The estimated scope, cost and delivery timelines for each option are set out in this PSCR.

The credible options outlined in this PSCR have been developed as part of our long-term planning for the area and each involves a series of investments over the next twenty years. While this RIT-T will assess all stages of these options in order to identify the most efficient series of investments to meet network needs over the long-term, the immediate impact of this RIT-T will be TransGrid progressing the nearer-term stages of the ultimately preferred option (i.e., those expected to be required in the next five years). TransGrid anticipates that a separate RIT-T will be applied in the future to the later stages in order to determine whether they remain optimal.

Non-network solutions may also be able to form credible options for this RIT-T

TransGrid considers that non-network solutions may be able to form credible options for this RIT-T, either as standalone options or in combination with network options (or components of these options).

At this stage, TransGrid considers that possible solutions include but are not limited to:

- generation (both embedded and grid-connected);
- configuration of existing or expected renewable generators in the area to provide fast-acting reactive support;
- bulk or aggregated energy storage systems, e.g.:
  - sealed batteries;
  - flow batteries;
  - concentrated solar thermal with storage;
  - compressed air storage;

  - pumped hydro; and
- voluntary curtailment of customer load.

TransGrid considered the variables that drive each of the different components of the identified need (ie, the voltage and thermal constraints), what a non-network option should be able to provide and has provided an indicative assessment of when such options must be available in the non-network Expression of Interest (EOI) released alongside this PSCR.

This PSCR and the accompanying EOI include the following for both the voltage constraint and the thermal constraint:

- magnitude of voltage support required (MVAr);
- expected cumulative exposure per annum (hours);
- frequency per annum; and
- expected duration per event (hours).

The EOI also specifies the type and form of information TransGrid is seeking from proponents in order to have their solutions assessed in the PADR.

TransGrid encourages parties to make contact (via written submissions or otherwise) regarding the potential of non-network options to satisfy, or contribute to satisfying, the identified need for this RIT-T.

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 17 June 2021.

Submissions should be emailed to TransGrid's Regulation team via regulatory.consultation@transgrid.com.au.[5] In the subject field, please reference 'PSCR Maintaining reliable supply to Bathurst, Orange and Parkes areas.'

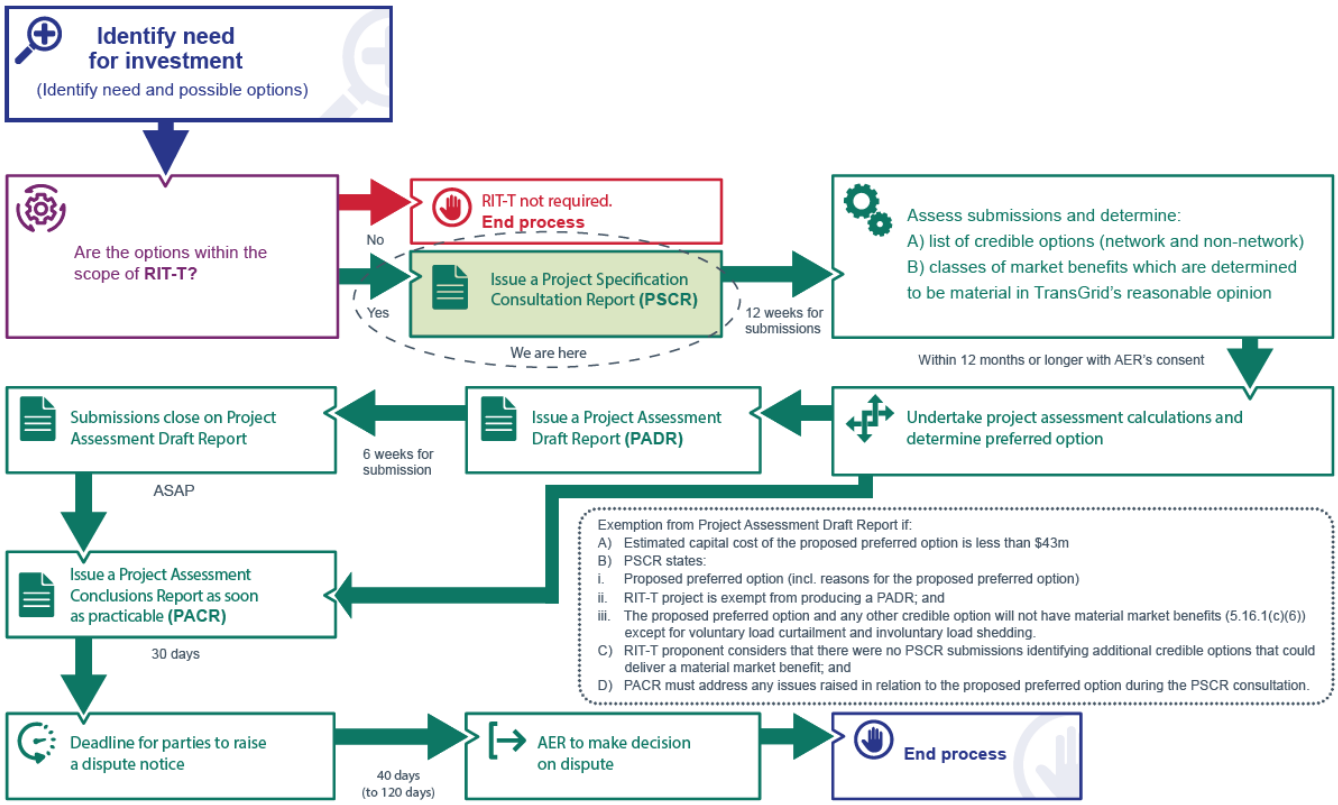
At the conclusion of the consultation process, all submissions received will be published on the TransGrid's website. If you do not wish for your submission to be made public, please clearly specify this at the time of lodgement.

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 mid-2021.

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

[5] 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[6]



[6] 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