TransGrid

Summary: Maintaining a reliable supply to Broken Hill

RIT-T – Project Specification Consultation Report

Region: South Western NSW

Date of issue: 8 November 2019

Summary

TransGrid is applying the Regulatory Investment Test for Transmission (RIT-T) to options for maintaining reliable supply to Broken Hill. Publication of this Project Specification Consultation Report (PSCR) represents the first step in the RIT-T process.

Broken Hill is located in the far west of New South Wales and is part of TransGrid's south western transmission network. It is currently supplied by a single 220 kV transmission line, 'Line X2', from Buronga which spans approximately 260 km.

The average electricity demand at Broken Hill substation is approximately 38 MW.

In addition, Broken Hill Solar Plant (53 MW) and Silverton Wind Farm (200 MW) are both connected to Broken Hill substation.

When Line X2 is out of service due to a planned or unplanned outage, electricity supply to Broken Hill is supported by two gas turbines owned by Essential Energy to avoid involuntary load shedding (these turbines each have a nameplate rating of 25 MW). TransGrid relies on these gas turbines to meet the NSW Electricity Transmission Reliability and Performance Standards 2017 (the 'reliability standards') set by the NSW Energy Minister and regulated by the NSW Independent Pricing and Regulatory Tribunal (IPART). In accordance with these standards, Essential Energy's gas turbines allow TransGrid to operate its network so as not to expect more than 10 minutes of unserved energy (EUE) per year at average demand.[1]

Identified need: maintaining reliable supply to Broken Hill

Essential Energy has notified TransGrid of its decision to divest the gas turbines located at Broken Hill. If no action is taken by TransGrid, this will result in the required reliability of supply to Broken Hill not being maintained, and involuntary load shedding when Line X2 is on planned or unplanned outage.

TransGrid considers this a 'reliability corrective action' under the RIT-T as the identified need is to ensure that the externally-imposed reliability standards for Broken Hill continue to be met.

In order to efficiently avoid involuntary load shedding and meet the reliability standards TransGrid has adopted a two-step approach.

- **Step 1** – Establish a short-term non-network support solution, via an Expression of Interest (EOI) process. The EOI was issued in October 2019 with responses due in November 2019. This short-term non-network support solution will be required to be available:
  - immediately, and
  - until the long-term solution, which will be identified under this the RIT-T process is operational. This could be up to three years.
- **Step 2** – Establish a long-term solution via the RIT-T. This document is the first step in the RIT-T process, which will consider all credible long-term options including traditional network, innovative, and non-network solutions. It may take up to three years for the long-term solution identified under the RIT-T process to be operational.

TransGrid's revenue determination for the 2018-2023 regulatory control period includes a contingent project for the reliability of supply to Broken Hill. This contingent project is to provide additional capacity to supply

[1] IPART, *NSW Electricity Transmission Reliability and Performance Standard 2017*, available at: https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/licensing-compliance-electricity-transmission-reliability/nsw-electricity-transmission-reliability-and-performance-standard-2017.pdf

Broken Hill in an event that the total 220 kV and 22 kV load at Broken Hill exceeds the capacity of the back-up gas turbines owned by Essential Energy and EUE exceeds the allowance.

Credible options considered

TransGrid considers there are five types of credible long-term option that would meet the identified need from a technical, commercial, and project delivery perspective.

While the indicative cost estimates for these options are specified in Table 1, more accurate figures from responses to this PSCR and the accompanying EOI will be used for the cost-benefit analysis in the Project Assessment Draft Report (PADR).

Table 1: Summary of the long-term credible options, $2018-19

Option	Description	Estimated capital cost	Estimated annual operating cost	Estimated completion date
1	Network support service	To be estimated based on responses to the EOI	To be estimated based on responses to the EOI	To be estimated based on responses to the EOI
2	Acquire existing gas turbines from Essential Energy	To be estimated based on responses to the EOI	~$2 million to $10 million per year	To be estimated based on responses to the EOI
3	New gas turbines at Broken Hill	~$75 million (to be refined based on responses to the EOI)	~$2 million to $10 million per year	To be in-place by 2021/22
4	Establish a second single circuit 220 kV transmission line from Buronga to Broken Hill	~177 million[2]	~$10,000 to $35,000 per year	To be in-place by 2023/24
5	Local storage and grid stability devices that provide inertia and system strength at Broken Hill	~$60 million to $350 million	To be estimated based on responses to the EOI	2022/23, subject to EOI responses

[2] TransGrid, *Revised Regulatory Proposal 2018/19-2022/23*, available at: https://www.aer.gov.au/system/files/TransGrid%20-%20Revised%20Revenue%20Proposal%20-%201%20December%202017.pdf

Net market benefits of the options are planned to be assessed under three different scenarios

TransGrid has constructed three alternative scenarios that are planned to be used in the cost benefit assessment in the PADR – namely:

- a 'low benefit' scenario, involving a number of assumptions that give rise to a lower bound Net Present Value (NPV) estimate of the expected net market benefits, in order to represent a conservative future state of the world with respect to potential benefits that could be realised;
- a 'central' scenario, which consists of assumptions that reflect TransGrid's central set of variable estimates which, in TransGrid's opinion, provides the most likely scenario; and
- a 'high benefit' scenario – this scenario reflects an optimistic set of assumptions, which have been selected to investigate an upper bound on reasonably expected net market benefits.

A summary of the key variables in each scenario is provided in the table below.

Table 2: Summary of scenarios

Variable / Scenario	Central	Low	High
Capital costs	Base estimate	Base estimate + 25%	Base estimate - 25%
Involuntary load shedding	Based on POE50 demand forecast	Based on POE90 demand forecast	Based on POE10 demand forecast
VCR	Expected to be based on the AER determined VCR values (to be published by 31 December 2019)	Expected to be a lower bound based on the level of confidence in the AER determined VCR values	Expected to be an upper bound based on the level of confidence in the AER determined VCR values
Discount rate	5.9%[3]	8.95%	2.85%

TransGrid considers that the central scenario is most likely since it is based primarily on a set of expected assumptions. TransGrid proposes to therefore assign this scenario a weighting of 50 per cent, with the other two scenarios being weighted equally with 25 per cent each.

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.

Alongside this document, TransGrid has released an EOI to provide additional detail on the technical requirements for network and non-network options.

TransGrid welcomes written submissions on materials contained in this PSCR and the accompanying EOI. 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 31 January 2020.

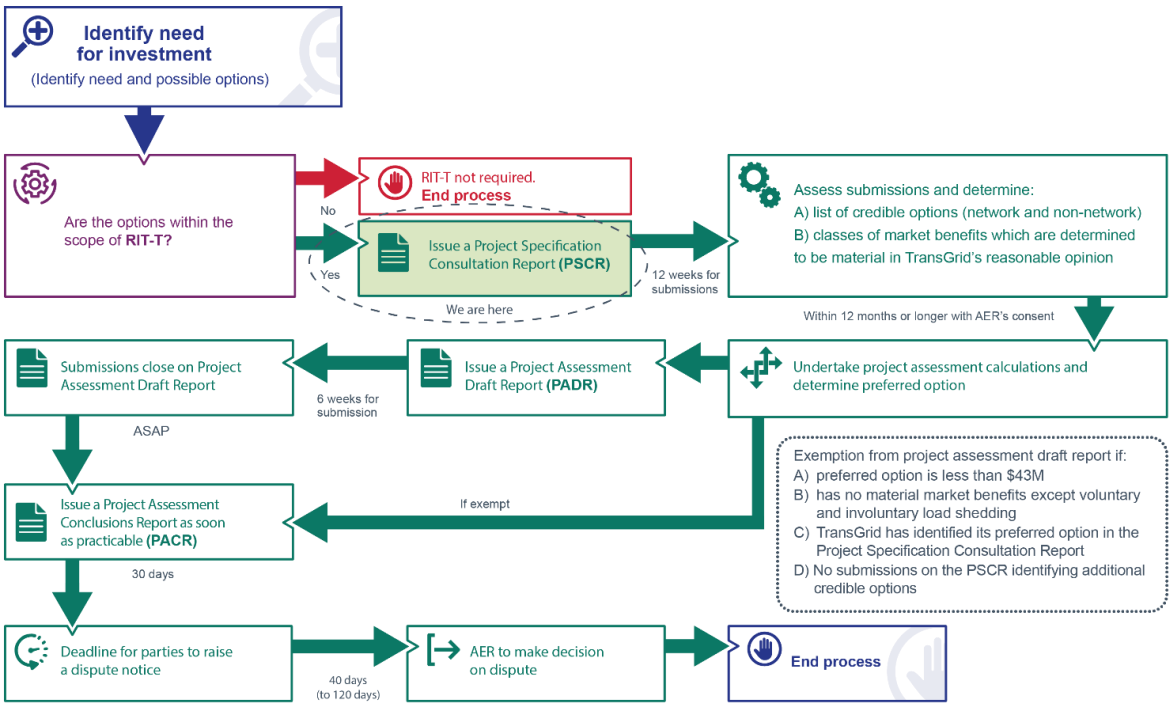
[3] Electricity Networks Association. *"RIT-T Economic Assessment Handbook."* Melbourne: Electricity Networks Association, 2019. https://www.energynetworks.com.au/sites/default/files/ena_rit-t_handbook_15_march_2019.pdf

Submissions should be emailed to TransGrid's Regulation team via regulatory.consultation@transgrid.com.au.[4] In the subject field, please reference 'PSCR Broken Hill reliability project.'

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 early 2020.

Figure 1: This PSCR is the first stage of the RIT-T process[5]



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

[4] 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.

[5] 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