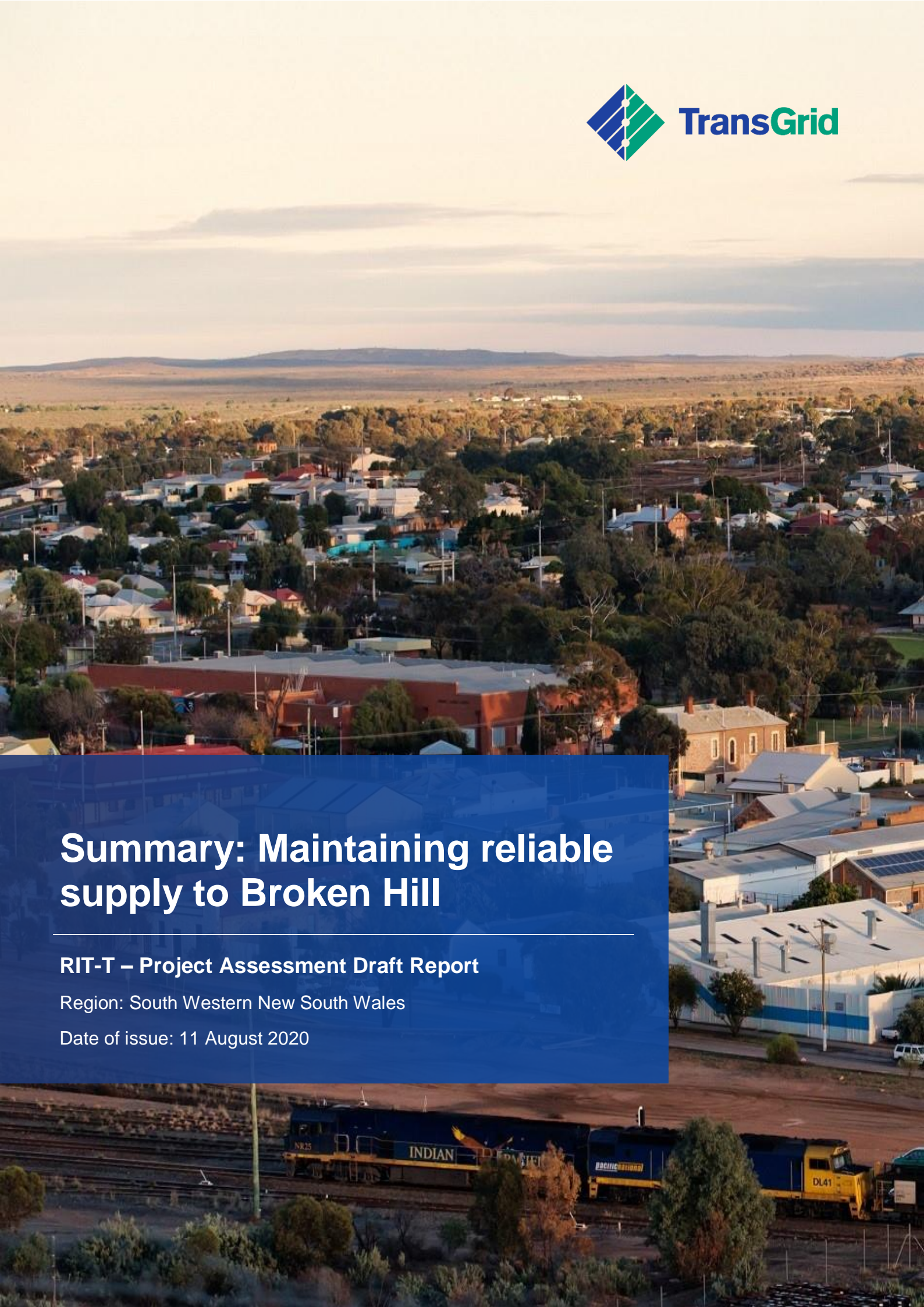


Summary: Maintaining reliable supply to Broken Hill

RIT-T – Project Assessment Draft Report

Region: South Western New South Wales

Date of issue: 11 August 2020



Disclaimer

This suite of documents comprises TransGrid's application of the Regulatory Investment Test for Transmission (RIT-T) which has been prepared and made available solely for information purposes. It is made available on the understanding that TransGrid and/or its employees, agents and consultants are not engaged in rendering professional advice. Nothing in these documents is a recommendation in respect of any possible investment.

The information in these documents reflect the forecasts, proposals and opinions adopted by TransGrid as at August 2020 other than where otherwise specifically stated. Those forecasts, proposals and opinions may change at any time without warning. Anyone considering information provided in these documents, at any date, should independently seek the latest forecasts, proposals and opinions.

These documents include information obtained from the Australian Energy Market Operator (AEMO) and other sources. That information has been adopted in good faith without further enquiry or verification. The information in these documents should be read in the context of the Electricity Statement of Opportunities, the Integrated System Plan published by AEMO and other relevant regulatory consultation documents. It does not purport to contain all of the information that AEMO, a prospective investor, Registered Participant or potential participant in the National Electricity Market (NEM), or any other person may require for making decisions. In preparing these documents it is not possible, nor is it intended, for TransGrid to have regard to the investment objectives, financial situation and particular needs of each person or organisation which reads or uses this document. In all cases, anyone proposing to rely on or use the information in this document should:

1. Independently verify and check the currency, accuracy, completeness, reliability and suitability of those information
2. Independently verify and check the currency, accuracy, completeness, reliability and suitability of reports relied on by TransGrid in preparing these documents
3. Obtain independent and specific advice from appropriate experts or other sources.

Accordingly, TransGrid makes no representations or warranty as to the currency, accuracy, reliability, completeness or suitability for particular purposes of the information in this suite of documents.

Persons reading or utilising this suite of RIT-T-related documents acknowledge and accept that TransGrid and/or its employees, agents and consultants have no liability for any direct, indirect, special, incidental or consequential damage (including liability to any person by reason of negligence or negligent misstatement) for any damage resulting from, arising out of or in connection with, reliance upon statements, opinions, information or matter (expressed or implied) arising out of, contained in or derived from, or for any omissions from the information in this document, except insofar as liability under any New South Wales and Commonwealth statute cannot be excluded.

Privacy notice

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.

Under the National Electricity Law, there are circumstances where TransGrid may be compelled to provide information to the Australian Energy Regulator (AER). TransGrid will advise you should this occur.

TransGrid's Privacy Policy sets out the approach to managing your personal information. In particular, it explains how you may seek to access or correct the personal information held about you, how to make a complaint about a breach of our obligations under the Privacy Act, and how TransGrid will deal with complaints. You can access the Privacy Policy here (<https://www.transgrid.com.au/Pages/Privacy.aspx>).

Summary

TransGrid is applying the Regulatory Investment Test for Transmission (RIT-T) to long-term options for maintaining reliable supply to Broken Hill. Publication of this Project Assessment Draft Report (PADR) represents the second step in the RIT-T process and follows the Project Specification Consultation Report (PSCR) released in November 2019.

Benefits from the options considered in this PADR

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.

When Line X2 is out of service due to planned or unplanned outage, electricity supply to Broken Hill is supported by two gas turbines, which are owned by Essential Energy, to avoid involuntary load shedding. 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).

Essential Energy has notified TransGrid of its decision to divest the gas turbines located at Broken Hill and is currently in the process of enacting that divestment. If no action is taken by TransGrid, this would 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.

All of the credible options assessed in this PADR provide back-up and reliable supply to Broken Hill for the future that is consistent with the NSW Electricity Transmission Reliability and Performance Standards.

Some of the credible options assessed will also affect the wholesale electricity market. In particular:

- > some options involve grid-connected batteries and/or other equivalent technologies that introduce new entities trading in the wholesale market, eg, storage dispatching into the National Electricity Market (NEM) outside of times when it is needed to meet its Broken Hill network support commitments; and
- > the impact on network capacity under some of the options facilitates greater uptake of renewables in surrounding Renewable Energy Zone (REZ) areas.

Both the benefits from the provision of reliable supply to Broken Hill and wider wholesale market benefits have been estimated as part of this PADR.

The PADR analysis has benefited from extensive stakeholder consultation

The PSCR was released in November 2019 and TransGrid subsequently received submissions from five parties.

Four of these parties have explicitly requested confidentiality as their submissions relate to the provision of solutions that form either part of, or standalone, credible options. The Public Interest Advocacy Centre was the fifth submitter and did not request confidentiality and TransGrid has responded to the points raised in this PADR.

Prior to, as well as after, receiving submissions, TransGrid held a number of bilateral meetings with submitters in order for them to further understand the RIT-T assessment and the reliability requirements at Broken Hill, as well as how their solutions are expected to be able to assist with meeting the identified need. These discussions have played a pivotal role in being able to define and include the credible options assessed in this PADR and TransGrid thanks all parties for their time and effort to-date.

TransGrid will be engaging further with parties based on the outcome of this PADR to confirm the technical feasibility of the options, which is expected to involve the provision of further information and modelling from these parties. A full assessment of technical feasibility is intended to be undertaken ahead of the PACR where parties confirm they are proponents and provide the required information.

Five types of credible options have been developed and assessed in this PADR

Stakeholder consultation on the PSCR has assisted greatly with developing and refining the credible options put forward in the PSCR. Specifically, consultation with third parties since the PSCR has enabled this PADR to assess the following five types of credible options:

- > Option 1: four different non-network opex solutions fully provided by third parties (Option 1A, Option 1B, Option 1C and Option 1D);
- > Option 2: a refined version, and cost for, acquiring the existing gas turbines from Essential Energy;
- > Option 3: establishing new gas turbines at Broken Hill;
- > Option 4: building a second single circuit 220 kV transmission line from Buronga to Broken Hill; and
- > Option 5: three variants of the first group of solutions involving either shared ownership or ownership by TransGrid (Option 5A, Option 5B and Option 5C).

All options reduce expected unserved energy (EUE) at Broken Hill to the amount required under the IPART reliability standard. Option 4 provides an additional level of reliability due to the second transmission line and is assessed to reduce EUE to effectively zero.

TransGrid notes that the existing gas turbines form a component of several options. However, they are only ultimately able to be offered either by the party who purchases the turbines, or by a party that contracts with the purchaser. Depending on when the divestment process concludes, there may therefore be a reassessment of credible options between the PADR and the PACR, including the cost of non-network options that assume the use of these turbines.

The four non-network opex solutions fully provided by third parties (Option 1A, Option 1B, Option 1C and Option 1D) and the three variants of these solutions involving either shared ownership or ownership by TransGrid (Option 5A, Option 5B and Option 5C) have been assessed using information (including costs) provided by parties in response to the PSCR and in subsequent engagement with TransGrid. The nature and size of each option are outlined below, excluding the existing gas turbines where they form part of a party's solution.

- > Option 1A/5A – 150-200 MW/1,550 MWh compressed air energy storage facility
- > Option 1B/5B – 62.5 MW/250 MWh battery
- > Option 1C/5C – 73 MW/292 MWh battery
- > Option 1D – 50 MW/75 MWh battery, 10 MW of demand response

In order to maintain confidentiality of commercial-in-confidence information in submissions, these costs, and cost structures, have not been presented in this PADR.

The preferred option delivers positive net benefits and is the top-ranked option across all reasonable future scenarios

Uncertainty is captured under the RIT-T framework through the use of scenarios, which reflect different assumptions that are expected to affect the key drivers of the estimated net market benefits.

The credible options have been assessed under three scenarios as part of this PADR assessment, which are characterised as follows:

- > a 'low net economic benefits' scenario, involving a number of assumptions that gives a lower bound and conservative estimate of net present value of net economic benefits;

- > a 'central' scenario which consists of assumptions that reflect TransGrid's central set of variable estimates that provides the most likely scenario; and
- > a 'high net economic benefits' scenario that reflects a set of assumptions which have been selected to investigate an upper bound of net economic benefits.

The table below summarises the specific key variables that influence the net benefits of the options under each of the scenarios considered.

Table 1: Summary of scenarios

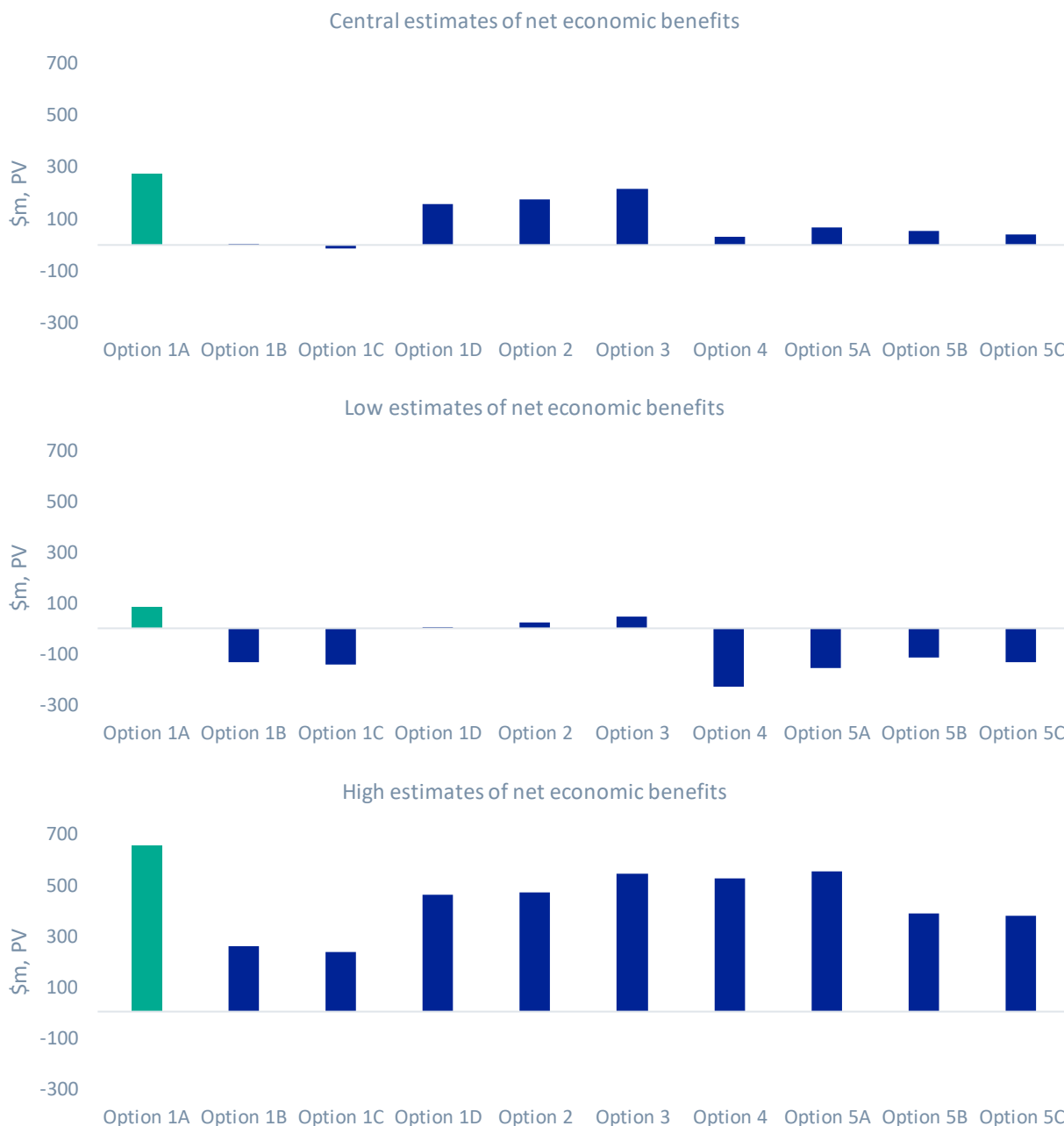
Variable	Central	Low net economic benefits	High net economic benefits
Network capital costs	Base estimate	Base estimate + 25%	Base estimate - 25%
Broken Hill demand	Based on POE50 demand forecast	Based on POE90 demand forecast	Based on POE10 demand forecast
Wholesale market benefits estimated	EY estimated based on central ISP scenario (as outlined in section 6 below)	30 per cent lower than what EY has estimated	30 per cent higher than what EY has estimated
VCR	\$36.43/kWh	\$25.50/kWh	\$47.36/kWh
Discount rate	5.90%	9.57%	2.23%

The results of the PADR assessment find that Option 1A (a non-network opex solution fully provided by a third party) is expected to deliver the greatest net benefits of all options, across all three scenarios considered. Estimated net benefits for this option range from approximately \$85 million to \$653 million depending on the scenario.

The second-ranked option is Option 3 (establishing new gas turbines at Broken Hill). On a weighted basis this option is expected to deliver around 21 per cent lower net benefits than Option 1A.

TransGrid will be engaging further with third parties based on the outcome of this PADR to confirm the technical and commercial feasibility of all options put forward. Option 3 would be the fallback option if the technical and commercial feasibility of these other options cannot be confirmed.

Figure 1: Summary of the estimated net benefits



The market benefits of all options are primarily derived from avoided involuntary load shedding compared to the base case. The preferred option also provides significant wholesale market benefits, primarily in the form of avoided, or deferred, costs associated with generation and storage in the NEM, compared to the base case. This benefit makes up around 88 per cent of the total wholesale market benefits estimated for Option 1A and arises since the facility commissioned at Broken Hill to provide back-up supply is of sufficient size to also trade in the wholesale market (and does so at a relatively low cost). While other options also provide estimated wholesale market benefits, they are all significantly lower than those estimated for Option 1A.

TransGrid has also tested the robustness of the assessment to a range of sensitivities, in particular the capacity of the 330kV transmission system west of Wagga Wagga, removing the 150 MW REZ capacity assumed at Broken Hill for the preferred option, the assumed timing of having to replace the existing gas turbines at Broken Hill, the capital costs of the credible options and alternate commercial discount rate assumptions. All tests confirm the conclusion that Option 1A is the optimal investment at this stage of the RIT-T, with Option 3 ranked second.

The regulatory treatment of non-network costs is a key driver of the preferred option

While Option 1A, a non-network opex solution fully provided by a third party, is the preferred option at this stage of the RIT-T, the corresponding option proposed by the same third party involving TransGrid ownership (Option 5A) is one of the lowest ranked options, due to the different regulatory treatment of costs under the RIT-T assessment.

While Option 1A and Option 5A are identical in terms of the technologies employed and the benefits expected, the total cost of Option 1A in the analysis is significantly lower than that for Option 5A. This is due to AER guidance requiring only the proposed contract costs for non-network options be included in the RIT-T assessment, while the entire capital and operating costs must be included for network options. The costs for Option 1A can therefore be net of any funding the third party expects to receive from using the facility to trade in the NEM, while the costs of Option 5A cannot.

TransGrid notes that Energy Networks Australia (ENA) recently raised the issue of the differential treatment of third party funding in its submission to the AER on the guidelines to make the ISP actionable.¹ TransGrid considers the outcome of the assessment presented in this PADR presents a real world example of how the current AER guidance for these two types of options tilts the playing field towards non-network provision of these services.

TransGrid intends to confirm and clarify with the AER how this issue should best be treated in the RIT-T in order to promote the objective of competitive neutrality and ensure that only the most efficient cost outcome is ultimately recovered from end customers.

Next steps

TransGrid welcomes written submissions on this PADR. Submissions are due on 22 September 2020.

Submissions should be emailed to TransGrid's Regulation team via regulatory.consultation@transgrid.com.au.² In the subject field, please reference 'PADR 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 PACR. The PACR is expected to be published in late 2020.

To read the full Project Assessment Draft Report visit [TransGrid's website](#).

¹ ENA, *Submission to the AER on the Guidelines to Make the ISP Actionable*, 26 June 2020, pp. 7-8.

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.