

Summary: Maintaining voltage levels in Northern NSW

RIT-T Project Specification Consultation Report

Region: Northern NSW

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Summary

We are applying the Regulatory Investment Test for Transmission (RIT-T) to options for maintaining voltage levels in the Moree and Inverell area in Northern New South Wales (NSW). Publication of this Project Specification Consultation Report (PSCR) represents the first step in the RIT-T process.

The Australian Energy Market Operator (AEMO) forecasts that minimum demand in NSW will rapidly decline over the next 10 years due to ongoing growth in distributed solar (PV) generation.¹ In Northern NSW, growth in small to large scale embedded generation connecting to the Essential Energy network is forecast to continue, driving declining minimum demand in this region.

The Northern NSW region is supplied by a series of 132 kV transmission lines which form a link between Glen Innes, Armidale and Tamworth. Our power system studies show that the declining minimum demand in these areas mean that the electricity transmission system in these areas is at risk of exceeding allowable voltage levels during times of low demand and in particular when nearby generators are unable to provide reactive power support.

We are required to manage the risk of system voltages exceeding their allowable limits as set out in the National Electricity Rules (NER)² and the NSW Electricity Reliability and Performance Standards 2017. This RIT-T therefore examines various network and non-network options to address the excess voltage levels to ensure compliance with the requirements of the NER and provide the greatest net benefit to the market.

Identified need: maintaining voltage levels in Northern NSW in compliance with NER requirements

The identified need for this RIT-T is to maintain voltage levels in Northern NSW by managing the risk of excess voltage levels due to declining minimum demand. There is an increasing likelihood of non-compliance with the NER and NSW reliability standards without investment to address the need.

We are required to maintain compliance with Schedule 5.1.4 of the NER and the NSW Electricity Reliability and Performance Standards 2017. Consequently, we consider this a 'reliability corrective action' under the RIT-T. A reliability corrective action differs from a 'market benefits'-driven RIT-T in that the preferred option is permitted to have negative net economic benefits on account of it being required to meet an externally imposed obligation on the network business.

Two credible network options have been identified

We have identified two credible network options that would meet the identified need from a technical, commercial, and project delivery perspective.³ These options are summarised in Table E-1 below.

¹ AEMO, [2021 Electricity Statement of Opportunities](#), August 2021.

² [Schedule 5.1.4 of the NER](#) requires us to plan and design equipment for voltage control to maintain voltage levels within 10 per cent of normal voltage. We expect non-compliance with this requirement will occur without remedial action.

³ As per clause 5.15.2(a) of the NER.

Table E-1: Summary of the credible options

Option	Description	Estimated capex (\$2021-22 +/- 25%)	Operating costs (\$2021-22, \$ per year)	Remarks
Option 1	Install a 66 kV 10 MVAR reactor at Moree and a 66 kV 15 MVAR reactor at Inverell	7.64 million	76,400	Provides the same benefits as Option 2, but at a higher cost
Option 2	Install a 132 kV 25 MVAR reactor at Inverell	5.41 million	54,100	Most economical and preferred option

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

We consider that non-network options may be able to assist with meeting the identified need, specifically non-network technologies that are able to provide reactive support. At this stage we consider that possible solutions include, but are not limited to:

- battery energy storage systems (BESS), and
- generators in the region who are able to provide reactive power support.

However, we note that the cost of the network options may act to effectively bound the cost available for any non-network options to be considered commercially feasible.

We encourage parties to make written submissions regarding the potential of non-network options to satisfy, or contribute to satisfying, the identified need for this RIT-T.

Option 2 delivers highest net economic benefits and will meet relevant regulatory obligations

Implementing Option 2 by 2025/26 will meet the relevant regulatory obligations set out in the NER and NSW reliability standards, maintaining voltage levels in Northern NSW in the long term.

Option 2 delivers the highest net economic benefits in all scenarios, meeting the identified need and avoiding expected unserved energy in the long term at a lower cost than Option 1. This makes Option 2 the preferred option.

Draft Conclusion

The optimal commercially and technically feasible option presented in this PSCR – Option 2 (Install a 132 kV 25 MVAR reactor at Inverell) – is the preferred option to meet the identified need and maintain voltage levels in Northern NSW.

Moving forward with this option is the most prudent and economically efficient solution to ensure the NER requirements and NSW reliability standards are met in the long term, while avoiding expected unserved energy.

The estimated capital expenditure associated with this option is \$7.64 million +/- 25 per cent. Routine operating and maintenance costs relating to planned activities are approximately \$76,400 per year.

This preferred option, Option 2, is not found to have positive net benefits under the weighted scenario, however, since this RIT-T is a reliability corrective action, the top-ranked option is permitted to have a negative market benefit.

We also conducted sensitivity analysis on the net economic benefit to investigate the robustness of the conclusion to key assumptions. Our analysis concluded that Option 2 remains the preferred option under all sensitivities studied.

The works will be undertaken between 2023/24 and 2025/26, with final commissioning of the solution expected in 2025/26.

All works will be completed in accordance with the relevant standards by 2025/26 with minimal modification to the wider transmission assets. Necessary outages of in-service equipment will be planned appropriately in order to complete the works with minimal impact on the network.

Exemption from preparing a Project Assessment Draft Report

Subject to additional credible options being identified during the consultation period, publication of a Project Assessment Draft Report (PADR) is not required for this RIT-T as we consider its investment in relation to the preferred option to be exempt from that part of the process under NER clause 5.16.4(z1). Production of a PADR is not required due to:

- the estimated capital cost of the proposed preferred option being less than \$46 million⁴;
- the PSCR states:
 - the proposed preferred option, together with the reasons for the proposed preferred option;
 - the RIT-T is exempt from producing a PADR; and
 - the proposed preferred option and any other credible option will not have a material market benefit for the classes of market benefit specified in clause 5.15A.2(b)(4), with the exception of market benefits arising from changes in voluntary and involuntary load shedding except for voluntary load curtailment and involuntary load shedding;
- the RIT-T proponent considers that there were no PSCR submissions identifying additional credible options that could deliver a material market benefit; and
- the PACR must address any issues raised in relation to the proposed preferred option during the PSCR consultation.

Submissions and next steps

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

We welcome written submissions on materials 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 25 October 2023.

⁴ Varied from \$43m to \$46m based on the [AER Final Determination: Cost threshold review](#) November 2021.

Submissions should be emailed to Transgrid's Regulation team via regulatory.consultation@transgrid.com.au.⁵ In the subject field, please reference 'Maintaining voltage levels in Northern NSW PSCR'.

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

Should we consider that no additional credible options were identified during the consultation period, we intend to produce a Project Assessment Conclusions Report (PACR) that addresses all submissions received including any issues in relation to the proposed preferred option raised during the consultation period. Subject to additional credible options being identified, we anticipate publication of a PACR by December 2023.

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 Privacy Notice within the Disclaimer for more details.