



# Maintaining Reliable Supply to the North West Slopes Area

RIT-T - Project Assessment Conclusions Report

Region: Northern New South Wales

Date of issue: 30 June 2022

People. Power. Possibilities.

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# Summary

We are applying the Regulatory Investment Test for Transmission (RIT-T) to options for maintaining reliable supply to the North West Slopes area of northern New South Wales (NSW). Publication of this Project Assessment Conclusions Report (PACR) represents the final stage in the RIT-T process and follows the Project Assessment Draft Report (PADR) released on 18 February 2022.

## Overview

The preferred option identified in this PACR involves a non-network solution provided through a BESS at the Gunnedah 132 kV substation and the installation of a third 60 MVA 132/66 kV transformer at Narrabri 132/66 kV substation in the near-term. It also involves the rebuilding of the existing 969 line between the Tamworth 330 kV and Gunnedah substations as a double circuit line and upgrading the 9UH line between Narrabri and Boggabri North to a rating of 100 MVA over the longer-term, depending on outturn demand forecasts.

The proposals of two separate third party non-network BESS proponents have been found to be ranked effectively equal in the PACR assessment. These options are referred to as Option 5B and Option 5C in the PACR, and reflect the proposed BESS component followed by the network investment outlined above. These options are found to deliver approximately \$513 million and \$496 million in net benefits, respectively, relative to the 'do nothing' base case on a weighted basis, which compares to \$470 million for the preferred solely network option (Option 3A).<sup>1</sup> The proposal of the third BESS proponent (assessed as Option 5A) has been found to deliver lower net benefits than these two options but to effectively be ranked equally with Option 3A.

The non-network solutions will provide up to 57 MW and 20 MVA<sub>r</sub> in the Gunnedah area, providing both network and dynamic reactive support by 2030 to manage thermal constraints and voltage variations during high demand periods. Options with non-network solutions generally have higher net benefits because they can be deployed an estimated one to two years earlier than the pure network options, avoiding significant unserved energy in that period.

We will now enter into a competitive procurement process and commercial negotiations with non-network proponents for a network support contract and seek to put in place a contract with one of these parties. We consider these negotiations should involve all proponents involved in the RIT-T process (i.e., including Option 5A, which has lower estimated net benefits than the other two non-network options) and potentially others who are able to provide the same kind of solution within the required timeframe, since the timing of when BESS can be implemented is critical to which solution is ultimately preferred (and may be able to be refined through the negotiation process). In addition, we consider that having more parties involved in this process will ensure that the network support costs paid for by consumers are as efficient as possible.

Notwithstanding the above, we consider that if either of the following two events occur, they would likely constitute a 'material change in circumstances' (i.e., under clause 5.16.4(z3) of the NER):

1. None of the non-network proponents being able to commit to having the BESS in place to provide network support by a date that ensures that option continues to be considered as the top-ranked option under the RIT-T; or
2. Transgrid not being able to finalise a network support contract with any of the proponents that is expected to be accepted as prudent and efficient by the AER.

<sup>1</sup> Option 3A includes an additional network component to Options 5A-5C, as well as earlier investment in some components.

Should either (or both) of these events occur, we would seek an exemption from the AER under clause 5.16.4(z3) of the NER to avoid having to reapply the RIT-T. Specifically, we consider that, should either of the above events occur, then the analysis presented in this PACR demonstrates that Option 3A (i.e., the top ranking solely network option) should then be considered the preferred option under this RIT-T.

We consider this approach provides sufficient confidence that Transgrid will be able to progress an option to ensure the externally-imposed regulatory obligations and service standards this RIT-T is designed to meet are met at an efficient cost level without having to re-do the RIT-T. We note that re-doing the RIT-T would take significant time, which would compromise the reliability of supply to customers in the North West Slopes area and ultimately likely cost all NSW electricity customers more in the long-run.

We will update stakeholders when we consider that the network support agreement for one of these options is sufficiently certain, or at the point we determine there has been a material change in circumstances and that the investment should be progressed as a solely network option (i.e., Option 3A) (i.e., when we would submit an exemption to the AER from having to reapply the RIT-T).

All non-network options, as well as Option 3A, are expected to generate sufficient benefits to recover their costs within two years of commissioning their respective long-term solutions (under the weighted results and in present value terms).

## The identified need driving investment

Our latest forecasts indicate that electricity demand is expected to increase substantially in the North West Slopes area going forward due to a number of substantial industrial loads that are anticipated to connect, as well as underlying general load growth in Narrabri and Gunnedah.

Schedule 5.1.4 of the National Electricity Rules (NER) requires us to plan and design equipment for voltage control to maintain voltage levels within 10 per cent of normal voltage.<sup>2</sup> 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.<sup>3</sup>

We have undertaken planning studies that show that the current North West Slopes network will not be capable of supplying the combined increases in load in the area without breaching the National Electricity Rules (NER) requirements and that voltage-limited constraints will have to be applied in the 132 kV supply network if action is not taken, leading to substantial levels of unserved energy to end customers. Our planning studies also show that the increased demand will also lead to thermal constraints going forward, particularly during times of low renewable generation dispatch in the region.

If the longer-term constraints associated with the load growth 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.

<sup>2</sup> These levels are specified in Clause S5.1a.4.

<sup>3</sup> 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.

This RIT-T has therefore examined various 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. We consider 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.

## Benefits from the options considered in this PACR

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Without action, voltage-limited constraints will have to be applied in the 132 kV supply network that will lead to substantial levels of unserved energy to end customers. We are taking action under this RIT-T in order to avoid this outcome. All of the credible options have been designed to maximise the avoided unserved energy expected and ensure compliance with the requirements of the NER.

In addition, some of the credible options assessed also affect the wholesale electricity market. In particular, four of the options involve grid-connected BESS that are expected to introduce new entities trading in the wholesale market, eg, dispatching into the National Electricity Market (NEM) outside of the allocation of storage needed to meet network support commitments.

Both the benefits from the provision of reliable supply to the North West Slopes area and wider wholesale market benefits have been estimated as part of this PACR.

## Key developments since the PADR have been reflected in the PACR

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There have been a number of key developments since the PADR was released in February 2022, which impact the analysis in this RIT-T. In particular:

- the demand forecasts have been updated based on additional information provided by proponents of new or expanded industrial spot loads, as well as updated information on general load growth from Essential Energy;
- our forecasts of when voltage and thermal limits are expected to be breached have been updated in light of the revised demand forecasts;
- the wholesale market modelling has been updated to reflect the assumptions underpinning AEMO’s draft 2022 Integrated System Plan (ISP) and is now focused on the step-change, progressive change and hydrogen superpower scenarios (the scenario weightings have also been updated to be consistent with the draft 2022 ISP);
- there have been a number of updates to the non-network options that were assessed in the PADR (Option 5A and Option 5B), including to reflect new information provided by the proponents;
- a new non-network option (Option 5C) has been included in the assessment following a submission to the PADR;
- there has been an update to the assumptions regarding how BESS components are likely to be able to trade in the wholesale market, based on further analysis of the amount of storage that would be required to be reserved to provide network support; and
- there have been a number of updates to the network options, including revised costs and reactive support sizing.

The key changes in the PACR demand forecasts compared to the PADR are:

- Essential Energy providing revised general demand forecasts for the region as part of an annual update;
- the inclusion of the Narrabri Coal expansion in the central demand forecast (this is a new spot load that was not included in Essential Energy's demand forecasts at the time of the PADR); and
- a one year delay to the commencement of the expansion of the existing Vickery Coal Mine (VCM).

The last two changes above reflect additional information provided by proponents following the PADR.

There has been no change to the Narrabri Gas Project load reflected in the demand forecasts since the PADR.

We received submissions from four parties in response to the PADR. While submissions covered a range of topics, there were five main topics that emerged:

- a new non-network option was proposed by one submitter (and has been included in the PACR assessment as a new Option 5C);
- further details regarding earlier proposed non-network options were provided by the proponents;
- uncertainty around the demand forecasts;
- a proposal for an alternate conductor technology, that could reduce the network option costs; and
- the appropriateness of the 'high benefits' scenario.

The key matters raised in public submissions relevant to the RIT-T assessment are summarised in this PACR, together with our responses and how the matters raised have been reflected in the assessment. Many of the submissions were confidential and we have engaged directly with those parties on the points raised.

## The PACR assessment covers four different types of credible options

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This PACR assesses both network options and options involving non-network components followed by network investment.<sup>4</sup>

Each of the credible network options requires the installation of a third 60 MVA 132/66 kV transformer at Narrabri due to the firm supply capacity of the existing transformers at this location being exceeded and to ensure the reliability standard set by the Independent Pricing and Regulatory Tribunal (IPART) is met for Narrabri in the short-term.

Aside from the new 132/66 kV transformer at Narrabri, the credible network options assessed differ in the near-term by where, how and when new capacity is added to the North West Slopes region. In particular, there are three broad types of credible network option assessed that centre on:

- upgrading the existing line 969 from Tamworth to Gunnedah (Option 1A and Option 1B);
- installing new single or double circuit transmission lines between Tamworth and Gunnedah (Option 2A, Option 2B, Option 2C and Option 2D); and

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<sup>4</sup> Non-network options by themselves are not expected to be able to meet the identified need over the entire assessment period.



- rebuilding the existing line 969 from Tamworth to Gunnedah to be a double circuit line (Option 3A, Option 3B and Option 3C).

Most credible options include the provision of dynamic reactive support at Narrabri provided by an SVC or grid-scale BESS. Two options (Option 2C and Option 3C) involve a new transmission line between Gunnedah and Narrabri as an alternative to dynamic reactive support and the upgrade to the 9UH line.

While there have been no material changes to the network options since the PADR, the non-network options considered in the PACR assessment have been refined to reflect:

- submissions to the PADR, resulting in the timing of Option 5A being brought forward by six months from the PADR, minor revisions to the estimated costs of Option 5A and Option 5B and the inclusion of a third non-network option (Option 5C); and
- elements of the non-network options being resized and rescoped following additional information provided by proponents.

The non-network solutions have been modelled in terms of their ability to efficiently defer or avoid the rebuilding of line 969 as a double-circuit line,<sup>5</sup> which is part of the preferred solely network option (Option 3A).

Non-network options are not able to avoid or defer the need for the initial third transformer required at Narrabri, since capacity is required there immediately to ensure the reliability standard set by IPART is met at Narrabri. The non-network options therefore reflect a combination of an initial non-network component and a third Narrabri transformer in all scenarios, followed by a deferred rebuilding of line 969 as a double-circuit line and upgrading the 9UH line between Narrabri and Boggabri North in the central and high scenarios when the Narrabri Gas Project comes online.

Table E-1 below summarises each of the credible options assessed in the PACR.

**Table E-1: Summary of the credible options**

Option	Description	Estimated capex (\$2020/21)
<i>Upgrading the existing line 969 from Tamworth to Gunnedah</i>		
1A	<ul style="list-style-type: none"> <li>Install a third 60 MVA 132/66 kV transformer at Narrabri</li> </ul>	<ul style="list-style-type: none"> <li>\$8 million</li> </ul>
	<ul style="list-style-type: none"> <li>Upgrade the existing 969 line between Tamworth 330/132 kV and Gunnedah 132/66 kV substations to a rating of 160 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$51 million</li> </ul>
	<ul style="list-style-type: none"> <li>Install a 132 kV +50 MVAR (capacitive) -20 MVAR (inductive) SVC at Gunnedah substation</li> </ul>	<ul style="list-style-type: none"> <li>\$18 million</li> </ul>
	<ul style="list-style-type: none"> <li>Upgrade the 9UH line between Narrabri and Boggabri North to a rating of 100 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$28 million</li> </ul>
	<ul style="list-style-type: none"> <li>Upgrade the existing 968 line between Tamworth 330 and Narrabri substations to a rating of at least 160 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$149 million</li> </ul>
	<ul style="list-style-type: none"> <li>Install a 132 kV +60 MVAR -20 MVAR SVC at Narrabri</li> </ul>	<ul style="list-style-type: none"> <li>\$20 million</li> </ul>

<sup>5</sup> The rebuilding of this line is required when the Narrabri Gas Project comes online.

Option	Description	Estimated capex (\$2020/21)
1B	<ul style="list-style-type: none"> <li>Install a third 60 MVA 132/66 kV transformer at Narrabri</li> </ul>	<ul style="list-style-type: none"> <li>\$8 million</li> </ul>
	<ul style="list-style-type: none"> <li>Upgrade the existing 969 line between Tamworth 330/132 kV and Gunnedah 132/66 kV substations to a rating of 160 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$51 million</li> </ul>
	<ul style="list-style-type: none"> <li>Install a 132 kV +50 MVar (capacitive) -20 MVar (inductive) SVC at Gunnedah substation</li> </ul>	<ul style="list-style-type: none"> <li>\$18 million</li> </ul>
	<ul style="list-style-type: none"> <li>Upgrade the 9UH line between Narrabri and Boggabri North to a rating of 100 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$28 million</li> </ul>
	<ul style="list-style-type: none"> <li>Build a new 132 kV line between Tamworth 330/132 kV and Narrabri 132/66 kV substations</li> </ul>	<ul style="list-style-type: none"> <li>\$160 million</li> </ul>
<i>New single or double circuit transmission lines between Tamworth and Gunnedah</i>		
2A	<ul style="list-style-type: none"> <li>Install a third 60 MVA 132/66 kV transformer at Narrabri</li> </ul>	<ul style="list-style-type: none"> <li>\$8 million</li> </ul>
	<ul style="list-style-type: none"> <li>Build a new single circuit 160 MVA 132 kV line between Tamworth 330 kV and Gunnedah substations.</li> </ul>	<ul style="list-style-type: none"> <li>\$73 million</li> </ul>
	<ul style="list-style-type: none"> <li>Upgrade the existing 969 line to a rating of 135 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$51 million</li> </ul>
	<ul style="list-style-type: none"> <li>Upgrade the 9UH line to a rating of 100 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$28 million</li> </ul>
	<ul style="list-style-type: none"> <li>Install a 132 kV +50 MVar -20 MVar SVC at Narrabri</li> </ul>	<ul style="list-style-type: none"> <li>\$20 million</li> </ul>
2B	<ul style="list-style-type: none"> <li>Install a third 60 MVA 132/66 kV transformer at Narrabri</li> </ul>	<ul style="list-style-type: none"> <li>\$8 million</li> </ul>
	<ul style="list-style-type: none"> <li>Build a new double circuit 132 kV line between the Tamworth 330 kV and Gunnedah substations, each circuit rated at 160 MVA. Decommission the existing 969 transmission line</li> </ul>	<ul style="list-style-type: none"> <li>\$89 million</li> </ul>
	<ul style="list-style-type: none"> <li>Upgrade the 9UH line to a rating of 100 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$28 million</li> </ul>
	<ul style="list-style-type: none"> <li>Installation of a 132 kV +50 MVar -20 MVar SVC at Narrabri</li> </ul>	<ul style="list-style-type: none"> <li>\$20 million</li> </ul>
2C	<ul style="list-style-type: none"> <li>Install a third 60 MVA 132/66 kV transformer at Narrabri</li> </ul>	<ul style="list-style-type: none"> <li>\$8 million</li> </ul>
	<ul style="list-style-type: none"> <li>Build a new single circuit 160 MVA 132 kV line between Tamworth 330 kV and Gunnedah substations</li> </ul>	<ul style="list-style-type: none"> <li>\$73 million</li> </ul>
	<ul style="list-style-type: none"> <li>Upgrade the existing 969 line to a rating of 135 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$51 million</li> </ul>
	<ul style="list-style-type: none"> <li>Build a new single circuit 132 kV line between Narrabri and Gunnedah</li> </ul>	<ul style="list-style-type: none"> <li>\$106 million</li> </ul>
2D	<ul style="list-style-type: none"> <li>Install a third 60 MVA 132/66 kV transformer at Narrabri</li> </ul>	<ul style="list-style-type: none"> <li>\$8 million</li> </ul>
	<ul style="list-style-type: none"> <li>Build a new single circuit 330 kV line between Tamworth 330 kV and Gunnedah substations operated at 132 kV, rated at least 160 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$159 million</li> </ul>
	<ul style="list-style-type: none"> <li>Upgrade the existing 969 line to a rating of 135 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$51 million</li> </ul>
	<ul style="list-style-type: none"> <li>Upgrade the 9UH line to a rating of 100 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$28 million</li> </ul>
	<ul style="list-style-type: none"> <li>Install a 132 kV +50 MVar -20 MVar SVC at Narrabri</li> </ul>	<ul style="list-style-type: none"> <li>\$20 million</li> </ul>
<i>Rebuilding the existing line 969 from Tamworth to Gunnedah to be a double circuit line</i>		

Option	Description	Estimated capex (\$2020/21)
3A	• Install a third 60 MVA 132/66 kV transformer at Narrabri 132/66 kV substation	• \$8 million
	• Rebuild the existing 969 line between Tamworth 330 kV and Gunnedah substations as a double circuit	• \$87 million
	• Upgrade the 9UH line between Narrabri and Boggabri North to a rating of 100 MVA	• \$28 million
	• Install a 132 kV +60 MVAR (capacitive) -20 MVAR (inductive) SVC at Narrabri substation	• \$20 million
3B	• Install a third 60 MVA 132/66 kV transformer at Narrabri 132/66 kV substation	• \$8 million
	• Rebuild the existing 969 line between Tamworth 330 kV and Gunnedah substations as a double circuit	• \$87 million
	• Upgrade the 9UH line between Narrabri and Boggabri North to a rating of 100 MVA	• \$28 million
	• Install a 50 MW (50 MWh) BESS at Narrabri 132 kV	• Confidential
3C	• Install a third 60 MVA 132/66 kV transformer at Narrabri 132/66 kV substation	• \$8 million
	• Rebuild the existing 969 line between Tamworth 330 kV and Gunnedah substations as a double circuit	• \$87 million
	• Build a new single circuit 132 kV line between Narrabri and Gunnedah	• \$106 million
<i>Combination of non-network solutions with the top-ranked network option (Option 3A)</i>		
5A	• Install a third 60 MVA 132/66 kV transformer at Narrabri 132/66 kV substation	• \$8 million
	• Install a BESS at Gunnedah 132 kV as a network support service	• Confidential
	• Rebuild the existing 969 line between Tamworth 330 kV and Gunnedah substations as a double circuit	• \$87 million
	• Upgrade the 9UH line between Narrabri and Boggabri North to a rating of 100 MVA	• \$28 million
5B	• Install a third 60 MVA 132/66 kV transformer at Narrabri 132/66 kV substation	• \$8 million
	• Install a BESS near Gunnedah 132 kV as a network support service	• Confidential
	• Rebuild the existing 969 line between Tamworth 330 kV and Gunnedah substations as a double circuit	• \$87 million
	• Upgrade the 9UH line between Narrabri and Boggabri North to a rating of 100 MVA	• \$28 million
5C	• Install a third 60 MVA 132/66 kV transformer at Narrabri 132/66 kV substation	• \$8 million
	• Install a BESS at Gunnedah 132 kV as a network support service	• Confidential
	• Rebuild the existing 969 line between Tamworth 330 kV and Gunnedah substations as a double circuit	• \$87 million

Option	Description	Estimated capex (\$2020/21)
	<ul style="list-style-type: none"> <li>Upgrade the 9UH line between Narrabri and Boggabri North to a rating of 100 MVA</li> </ul>	<ul style="list-style-type: none"> <li>\$28 million</li> </ul>

Capital costs for the network options have been revised since the PADR to reflect the change in size of some elements, as well as to reflect current market trends and risks, drawing on the experience of recent projects. In addition, works for the line 969 double-circuit rebuild, and the 9UH line upgrading, now reflect the use (and costs) of an alternate conductor technology proposed in response to the PADR.

## Three scenarios have been assessed

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The RIT-T is focused on identifying the top ranked credible option in terms of expected net benefits. However, uncertainty exists in terms of estimating future inputs and variables (termed future ‘states of the world’).

To deal with this uncertainty, the NER requires that costs and market benefits for each credible option are estimated under reasonable scenarios and then weighted based on the likelihood of each scenario to determine a weighted (‘expected’) net benefit. It is this ‘expected’ net benefit that is used to rank credible options and identify the preferred option.

The credible options have been assessed under three scenarios as part of this PACR assessment, which differ in terms of the key drivers of the estimated net market benefits.

The three scenarios are characterised as follows:

- a ‘low net economic benefits’ scenario, involving a number of assumptions that gives a lower bound, conservative estimate of the present value of net economic benefits;
- a ‘central’ scenario based on a central set of variable estimates and reflects the most likely scenario; and
- a ‘high net economic benefits’ scenario that reflects a set of assumptions 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 E-2: Summary of scenarios**

Variable	Central	Low net economic benefits	High net economic benefits
Network capital costs	Base estimate	Base estimate + 25%	Base estimate - 25%
Non-network capital costs	Base estimate	Base estimate + 25%	Base estimate - 25%
Demand	Central demand forecast	Low demand forecast	Central demand forecast
New renewable generation in the area	In-service and committed generators from Appendix B.	All in-service, committed and advanced generators from Appendix B.	In-service and committed generators from Appendix B.
Wholesale market benefits estimated	EY estimated based on the step-change 2022 ISP scenario	EY estimated based on the progressive change 2022 ISP scenario	EY estimated based on the hydrogen superpower 2022 ISP scenario
VCR <sup>6</sup>	\$46.88/kWh	\$32.82/kWh	\$60.95/kWh
Discount rate	5.50%	7.50%	1.96%

The wholesale market modelling has been updated since the PADR and we now model the market benefits of the options (where relevant) across the three key 2022 ISP scenarios. We have also weighted each of the scenarios for this RIT-T based on the draft 2022 ISP weightings for the underlying ISP scenarios, i.e.:

- 52 per cent to central scenario (based on the step-change scenario in the ISP);
- 30 per cent to the low benefits scenario (based on the progressive change scenario in the ISP); and
- 18 per cent to the high benefits scenario (based on the hydrogen superpower scenario in the ISP).

We have also investigated the sensitivity of the results to alternate weightings as part of this PACR (and they are found not to be sensitive).

## The preferred option involves the use of BESS in the short-term coupled with network investment as demand grows

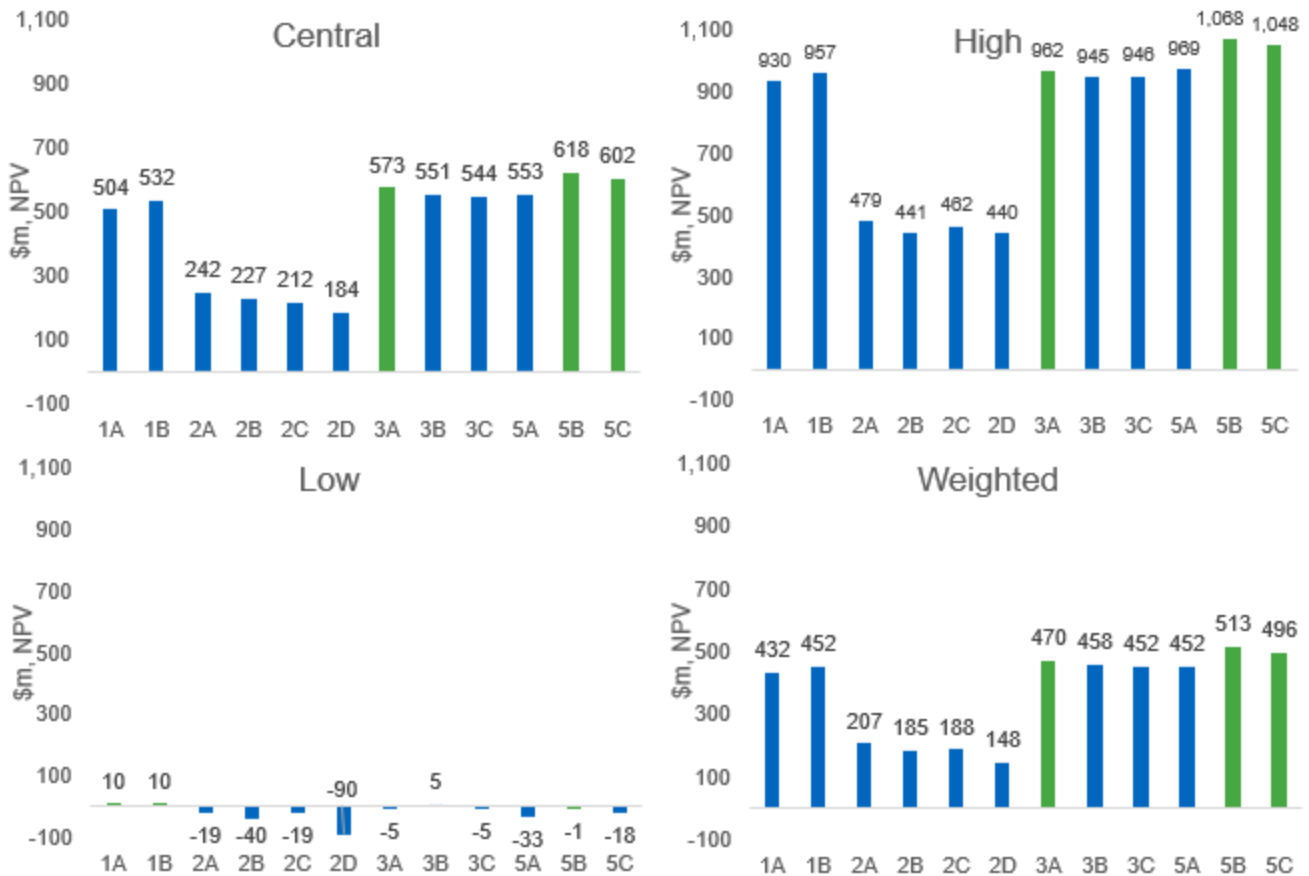
The preferred option identified in this PACR involves the use of a non-network solution provided via a new BESS at the Gunnedah 132 kV substation and the installation of a third 60 MVA 132/66 kV transformer at Narrabri 132/66 kV substation in the near-term. It also involves rebuilding of the existing 969 line between the Tamworth 330 kV and Gunnedah substations as a double circuit and upgrading the 9UH line between Narrabri and Boggabri North to a rating of 100 MVA over the longer-term, depending on outturn demand forecasts.

The proposals of two separate third party BESS proponents (coupled with network investment) have been found to be ranked effectively equal in the PACR assessment. These options are referred to as Option 5B and Option 5C in the PACR and are found to deliver approximately \$513 million and \$496 million in net

<sup>6</sup> The VCRs have been updated since the PADR to reflect the updated underlying demand forecasts, i.e., the load that would be affected under the base case. However, we note that this update has had only a minor impact on the estimated VCRs.

benefits, respectively, relative to the 'do nothing' base case on a weighted basis, which compares to \$470 million for the top-ranked solely network option (Option 3A).

**Figure E-1: Estimated net benefits for each scenario**



The proposal of the third BESS proponent (Option 5A) has been found to deliver lower net benefits than Option 5B and Option 5C and effectively be ranked equally with Option 3A.

While Option 3A has the second lowest expected total cost of the solely network options, in present value terms, under the weighted outcome, it can avoid a substantial amount of unserved energy one to two years earlier than the lowest cost network option (Option 2B).<sup>7</sup> Option 3A also has the lowest cost, in real terms, of the solely network options. Option 3A is therefore considered the preferred solely network option and is therefore the network option the non-network options have been coupled with.<sup>8</sup>

Almost all of the estimated gross benefits across all of the options are derived from avoided unserved energy, which makes up between 89 and 92 per cent of the total gross benefits of Options 5A-5C on a weighted basis (and 100 per cent for Option 3A since that option does not affect the wholesale market). We note also that we have applied a conservative approach to valuing these benefits, whereby all unserved energy in the later years of the assessment period is not valued (since it is common to all options), in order to enable the most meaningful comparison between options.

<sup>7</sup> The present value of all capex and opex of Option 3A under the weighted outcome is \$91 million, which compares to \$83 million for Option 2B.

<sup>8</sup> The non-network solutions are able to defer or avoid the rebuilding of line 969 as a double-circuit line under Option 3A.

While most options are found to have net costs under the low scenario, meaning that they are not preferred over the base case ‘do nothing’ option, we note that these net costs are only marginal and, if we did not apply the approach to removing unserved energy in the later years of the assessment period, all options would be found to have significantly positive net benefits.

Moreover, while the low scenario yields different top-ranked options, we do not consider this material to the overall conclusion of the RIT-T (i.e., that the non-network options are preferred) given the quantity of unserved energy expected to be avoided across the scenarios. The low scenario would need to be given an unreasonably high weighting in order to change the conclusion of this PACR. Specifically, we find that the low scenario would need to be given a weighting of approximately 74 per cent in order for either Option 5B or Option 5C to be ranked below any of the purely network.<sup>9</sup>

## Further information and next steps

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This PACR represents the final formal stage in the RIT-T process.

We will now enter into a competitive procurement process and commercial negotiations with non-network proponents for a network support contract and seek to put in place a contract with one of these parties.

Notwithstanding the above, we consider that if either of the following two events occur, they would likely constitute a ‘material change in circumstances’ (i.e., under clause 5.16.4(z3) of the NER):

1. None of the non-network proponents being able to commit to having the BESS in place to provide network support by a date that ensures that option continues to be considered as the top-ranked option under the RIT-T; or
2. Transgrid not being able to finalise a network support contract with any of the proponents that is expected to be accepted as prudent and efficient by the AER..

Should either (or both) of these events occur, we would seek an exemption from the AER under clause 5.16.4(z3) of the NER to avoid having to reapply the RIT-T. Specifically, we consider that, should either of the above events occur, then the analysis presented in this PACR demonstrates that Option 3A (i.e., the top ranking solely network option) should then be considered the preferred option under this RIT-T.

We consider this approach provides sufficient confidence that Transgrid will be able to progress an option to ensure the externally-imposed regulatory obligations and service standards this RIT-T is designed to meet are met at an efficient cost level without having to re-do the RIT-T. We note that re-doing the RIT-T would take significant time, which would compromise the reliability of supply to customers in the North West Slopes area and ultimately likely cost all NSW electricity customers more in the long-run.

We note that the Rules regarding a ‘material change in circumstances’, and the ability to include a ‘decision rule’ in a PACR, is currently being considered by the Australian Energy Market Commission.<sup>10</sup> In the event that the NER change following this PACR, we would consider the events above to constitute two elements of a decision rule for ultimately determining the preferred option for this RIT-T.

<sup>9</sup> We note that this weighting does not change if we value all avoided unserved energy in the assessment, i.e., if we do not apply the approach of removing unserved energy in the later years of the assessment outlined in section 6.1 of this PACR.

<sup>10</sup> AEMC, *Transmission Planning and Investment Review*, Consultation Paper, 19 August 2021, p. 54.

We will update stakeholders when we consider that the network support agreement for one of these options is sufficiently certain, or at the point we determine there has been a material change in circumstances and that the investment should be progressed as a solely network option (i.e., Option 3A) (i.e., when we would submit an exemption to the AER from having to reapply the RIT-T).

As stated in our revenue proposal for the 2023-2028 period,<sup>11</sup> we will include the preferred option identified through the RIT-T in our augmentation expenditure forecast in our Revised Revenue Proposal for the forthcoming regulatory period. More information on our 2023-28 revenue proposal can be found [here](#).

Further details in relation to this project can be obtained from [regulatory.consultation@transgrid.com.au](mailto:regulatory.consultation@transgrid.com.au). In the subject field, please reference 'North West Slopes Area reliability project.'

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<sup>11</sup> Transgrid, *Revenue Proposal 2023–2028*, 31 January 2022, p. 112.