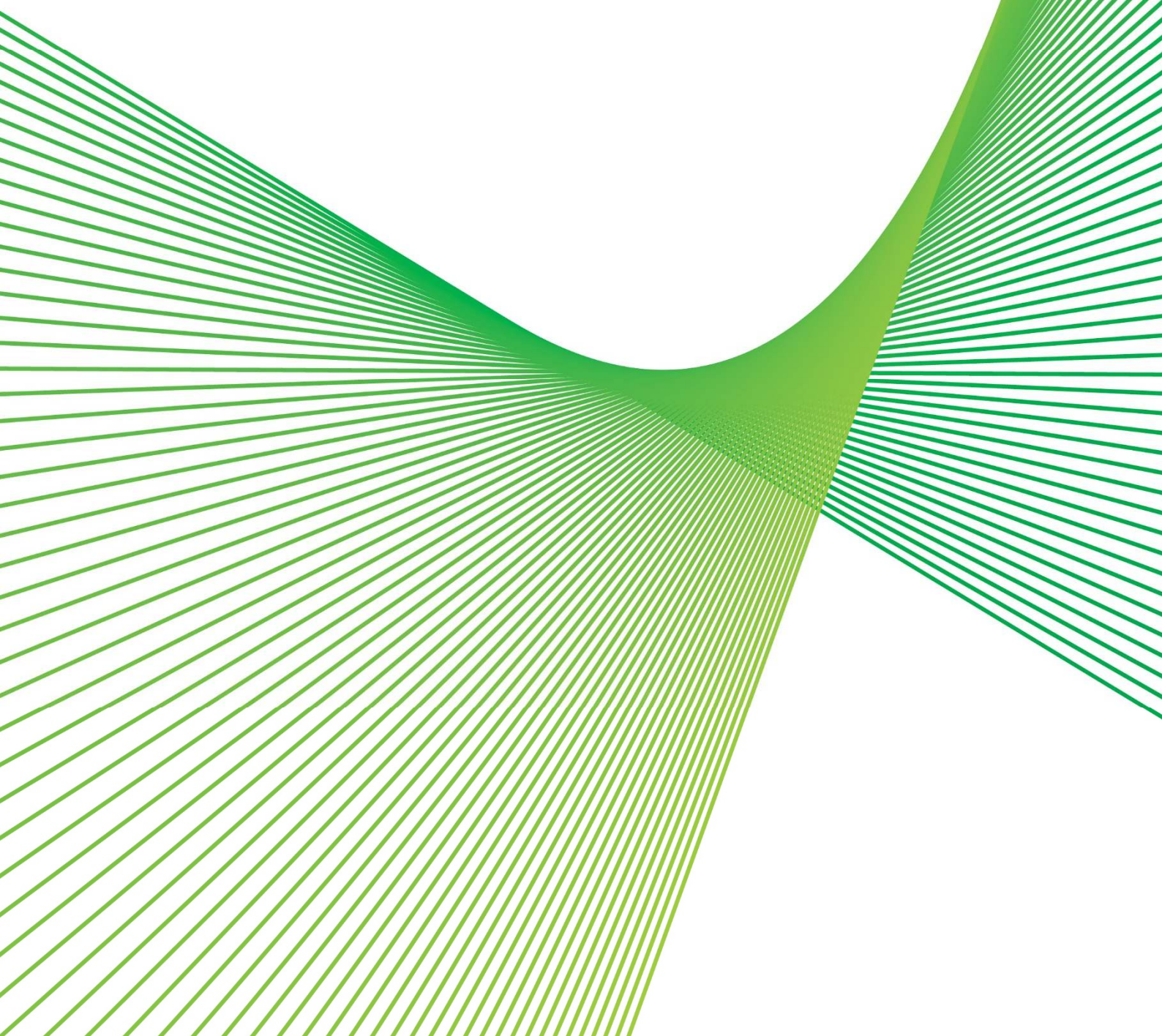


Summary: Managing risk on Line 8C/8J and 8C/8E

RIT-T Project Assessment Conclusions Report

Issue date: 15 November 2024



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Executive summary

We are applying the Regulatory Investment Test for Transmission (RIT-T) to options for mitigating safety, environmental (bushfire) and financial (high reactive maintenance) risks caused by the deteriorating condition of certain components of the 330 kV transmission line linking Dumaresq, Sapphire, and Armidale substations ('Line 8C/8J and 8C/8E'). The transmission line is a key link in the east coast network and is on the QNI transmission path which links the NSW and QLD regions of the National Electricity Market (NEM). Publication of this Project Assessment Conclusions Report (PACR) represents the final step in the RIT-T process.

The two double circuit, steel tower 330 kV transmission lines covered by this RIT-T are:

- Line 8C/8J – spanning a route of 58.9km between Dumaresq and Sapphire substations; and
- Line 8C/8E – spanning a route of 113.5km between Sapphire and Armidale substations.

The lines were constructed in 2000 as part of the interconnector between New South Wales and Queensland transmission networks and consists of 427 structures across the two lines. They mainly traverses rural agricultural land, bushland areas, and crosses some waterways, minor roads, and highways (the Gwydir Highway south of Sapphire substation, the New England Highway, and Waterfall Way north of Armidale substation).

Lines 8C/8J and 8C/8E were amongst the first constructed utilising Non-Ceramic Insulators (NCI) within the Transgrid network, and these are now approaching the end of their service life. The sample test results have shown a large reduction in hydrophobicity (ie ability of the insulator to resist the ingress of moisture), reduction in rod to housing adhesion and corona activity at the end fitting to housing interface, due to degradation and older design of this interface, after 21 years in service.

Recent inspection data and detailed asset condition analysis has identified that 140 of the 143 structures on Line 8C/8J and 280 of the 284 structures on Line 8C/8E have condition issues which require refurbishment to address its health and maintain appropriate risk levels across the network.

Identified need: managing risks on Line 8C/8J and 8C/8E

If action is not taken, the condition of Line 8C/8J and 8C/8E is expected to expose us and our customers to increasing levels of risk going forward, as the likelihood of failure increases. There are safety and bushfire risks under the 'do nothing' base case, as well as higher expected costs associated with reactive maintenance that may be required under emergency conditions ('financial risks').

The proposed investment will enable us to manage safety, environmental, reliability and financial risks on Line 8C/8J and 8C/8E.

Options considered under this RIT-T have been assessed relative to a base case. Under the base case, no proactive capital investment is made and the condition of the lines will continue to deteriorate.

We manage and mitigate safety and bushfire risk to ensure they are below risk tolerance levels or 'As Low As Reasonably Practicable' ('ALARP'), in accordance with our obligations under the *New South Wales Electricity Supply (Safety and Network Management) Regulation 2014* and our Electricity Network Safety Management System (ENSMS).¹

¹ Our ENSMS follows the International Organization for Standardization's ISO31000 risk management framework which requires following a hierarchy of hazard mitigation approach.

The proposed investment will enable us to continue to manage and operate this part of the network to a safety and risk mitigation level consistent with ALARP. Consequently, it is considered 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.

We note that the risk cost estimating methodology adopted for this RIT-T aligns with that used in our recently submitted Revised Revenue Proposal for the 2023-28 period. It reflects feedback from the Australian Energy Regulator (AER) on the methodology initially proposed in our original revenue proposal.

No submissions received in response to the Project Specification Consultation Report

We published a Project Specification Consultation Report (PSCR) on 15 August 2024 and invited written submissions on the material presented within the document. No submissions were received in response to the PSCR.

No material developments since publication of the PSCR

No additional credible options were identified during the consultation period following publication of the PSCR. In addition, no material changes have occurred since the PSCR that have made an impact on the preferred option.

There is currently only one credible option, Option 1 remains the preferred option at this stage of the RIT-T.

Credible options considered

In this PACR, we have considered one credible option that would meet the identified need from a technical, commercial, and project delivery perspective.² This option is summarised in the table below.

Table E-1 Summary of credible options

Option	Description	Capital costs (\$m +/- 25%, Real \$2024/25)
Option 1	Remediate all identified condition issues for line components which have experienced deterioration and/or reached the end of their technical lives	31.41 (±25%)

Four other options were considered but not progressed including increased inspections, elimination of all associated risk, new transmission line and non-network solutions. The reasons these options were not progressed are outlined in Section 3.3 of this PACR.

Non-network options are not able to assist for this RIT-T

We do not consider non-network options to be commercially and technically feasible to assist with meeting the identified need for this RIT-T, as non-network options will not mitigate the safety and environment risk posed as a result of deteriorating asset condition. In addition, we did not receive any submissions from proponents of any non-network solutions in response to the PSCR.

² As per clause 5.15.2(a) of the NER.

The options have been assessed against three reasonable scenarios

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 (i.e., the estimated risk costs avoided).

Given that wholesale market benefits are not relevant for this RIT-T, the three scenarios implicitly assume the most likely scenario from the 2024 ISP (ie, the ‘Step Change’ scenario). The scenarios differ by the assumed level of risk costs and unserved energy, given that these are key parameters that may affect the ranking of the credible options. Risk cost assumptions do not form part of AEMO’s ISP assumptions, and have been based on Transgrid’s analysis, as discussed in Section 2.

We developed the Central Scenario around a static model of demand scenarios, described further in Section A.3 of our [Network Asset Criticality Framework](#). We consider that this approach is appropriate since it materially reduces the computational effort required, and since differences in demand forecasts will not materially affect the ranking of the credible options.

How the NPV results are affected by changes to other variables (including the discount rate and capital costs) has been investigated in the sensitivity analysis. We consider this is consistent with the latest AER guidance for RIT-Ts of this type (i.e., where wholesale market benefits are not expected to be material).^{3,4,5}

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

Table E-2 Summary of scenarios

Variable / Scenario	Central	Low risk cost scenario	High risk cost scenario risk
Scenario weighting	1/3	1/3	1/3
Discount rate	7%	7%	7%
Network capital costs	Base estimate	Base estimate	Base estimate
Operating and maintenance costs	Base estimate	Base estimate	Base estimate
Safety, environmental and financial risk benefit	Base estimate	Base estimate – 25%	Base estimate +25%

The sensitivity analysis has investigated how the NPV results are affected by changes to other variables, including the discount rate and capital costs.

³ AER, *Application Guidelines Regulatory Investment Test for Transmission*, October 2023, pp. 43-44.

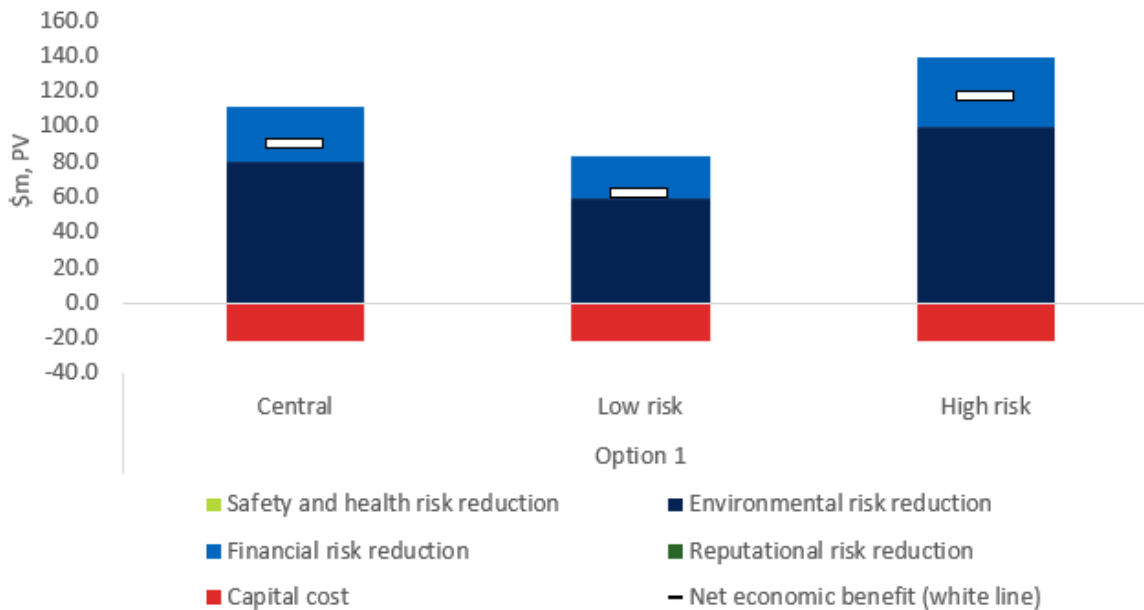
⁴ We consider the approach to scenarios and sensitivities to be consistent with the AER guidance provided in November 2022 in the context of the disputes of the North West Slopes and Bathurst, Orange and Parkes RIT-Ts. See: AER, *Decision: North West Slopes and Bathurst, Orange and Parkes Determination on dispute - Application of the regulatory investment test for transmission*, November 2022, pp. 18-20 & 31-32, as well as with the AER’s RIT-T Guidelines.

⁵ AEMO ‘2023 Inputs, Assumptions and Scenarios Report’, July 2023, p 123-124

Option 1 delivers positive net economic benefits

Under all scenarios, the costs of mitigating the risks under Option 1 are found to be significantly outweighed by the expected benefit of avoiding the risks. The net economic benefits delivered by Option 1 are estimated at \$89.42 million⁶.

Figure E-1 Net economic benefits (\$m, PV)



Conclusion

Option 1 (remediation of all identified condition issues for components of lines) is the preferred option to meet the identified need at this stage of the RIT-T. Moving forward with this option is the most prudent and economically efficient solution to manage and mitigate safety and environmental risk to ALARP. Consequently, it will ensure our obligations under the *New South Wales Electricity Supply (Safety and Network Management) Regulation 2014* and our Electricity Network Safety Management System (ENSMS) are met.

The estimated capital expenditure associated with this option is \$31.41 million. Routine operating and maintenance costs relating to planned checks by our field crew are approximately \$40,188 per year. We calculate that the avoided risk cost by undertaking Option 1 ranges from approximately \$6.1 million per year to \$25.1 million per year in real terms over the assessment period.

Option 1 is found to have positive net benefits under all scenarios investigated and, on a weighted basis, will deliver \$89.42 million in net economic benefits.

⁶ The relative size of this net economic benefits is due to the reduction of bushfire risk of the circuits concerned.

The works would be completed by 2026/27. All works would be completed in accordance with the relevant standards with minimal modification to the wider transmission assets. Necessary outages of affected line(s) in service would be planned appropriately in order to complete the works with minimal impact on the network.

Next steps

This PACR represents the final step of the consultation process in relation to the application of the RIT-T process undertaken by Transgrid.

The second step of the RIT-T process, production of a Project Assessment Draft Report (PADR), was not required as the investment meets the criteria for exemption under NER clause 5.16.4(z1), ie:

- the estimated capital cost of the preferred option is less than \$54 million⁷;
- the PSCR included statements on:
 - o the proposed preferred option, together with the reasons for the proposed preferred option;
 - o that Transgrid expects to be exempt from producing a PADR; and
 - o that the proposed preferred option and any other credible options 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;
- no PSCR submissions identified additional credible options that could deliver a material market benefit; and
- the PACR addresses any issues raised in relation to the proposed preferred option during the PSCR consultation (noting that no issues have been raised).

Parties wishing to raise a dispute notice with the AER may do so prior to 19 December 2024 (30 days after publication of this PACR). Any dispute notices raised during this period will be addressed by the AER within 40 to 100 days, after which the formal RIT-T process will conclude.

Further details on the RIT-T can be obtained from Transgrid's Regulation team via regulatory.consultation@transgrid.com.au. In the subject field, please reference 'Line 8C/8J and 8C/8E PACR'.

⁷ Varied from \$46m to \$54m based on the [AER Final Determination: Cost threshold review](#), November 2024.