

# Summary: Maintaining safe and reliable operation of Molong substation

RIT-T Project Assessment Conclusions Report

Region: Central NSW

Date of issue: 4 July 2024



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## Summary

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We are applying the Regulatory Investment Test for Transmission (RIT-T) to options for maintaining the safe and reliable operation of Molong substation. Publication of this Project Assessment Conclusions Report (PACR) represents the final step in the RIT-T process.

Molong 132/66kV substation is located in Transgrid's Central NSW network. It connects to Transgrid's 132kV Wellington, Manildra and Orange North substations. It also connects the Essential Energy 66kV distribution network and supports renewable generation from Molong Solar Farm.

As a customer connection point supplying Essential Energy in the Molong area, Molong substation supports the flow of electricity to local industries<sup>1</sup> and a residential population of approximately 13,000.<sup>2</sup> Transgrid's Central NSW network is also an area of interest for new renewable generation projects. Molong substation will continue to play a central role in the safe and reliable operation of the power system. New renewable generation with a combined output of 1,135 MW is in service in the region and a further 1,500 MW of renewable generation is committed or anticipated.

The condition of the Molong No.1 132kV transformer has been identified as reaching the end of its technical life leading to an increasing risk of failure which could result in reliability, safety, environmental and financial consequences. Replacing the transformer would also require replacing associated secondary systems such as switchgear, protection and control systems.

The purpose of this RIT-T is to examine and consult on options to address the deterioration of the Molong No.1 transformer at Molong substation to reduce the likelihood of prolonged and involuntary load shedding in the Central NSW region and reduce the risk of safety and environmental hazards associated with a catastrophic failure.

### **Identified need: ensure the safe and reliable operation of Molong substation**

The identified need for this project is to maintain the safe and reliable operation of Molong substation and the broader transmission network in NSW by addressing the risk of failure of Molong substation's No. 1 power transformer.

The natural age of the No. 1 transformer will be 62 years in 2023/24, which is well above the 45-year expected useful life of a power transformer. Condition assessments performed through our routine maintenance program has shown degradation in the condition of the power transformer which will increase its risk of failure. Without intervention, other than ongoing business-as-usual maintenance, the asset is expected to deteriorate further and more rapidly. This will increase the risk of supply interruptions to our customers as well as safety, environmental and financial consequences.

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<sup>1</sup> Major industries within Carbone include agriculture, mining and tourism and contribute towards the \$849.5 million annual economy and contribute significantly to the regional economy. Carbone Council. "Carbone Local Strategic Planning Statement 2020" 2020.10. Accessed 13 June 2024. <https://www.cabonne.nsw.gov.au/files/sharedassets/public/planning-and-development/local-strategic-planning-statement/cabonne-local-strategic-planning-statement-2020.pdf>

<sup>2</sup> The population of the Carbone Local Government Area is 13,766, as per the 2021 Census. Australian Bureau of Statistics, "2021 Census QuickStats", accessed 13 June 2024. <https://www.abs.gov.au/census/find-census-data/quickstats/2021/LGA11400>

We have classified this RIT-T as a 'market benefits' driven RIT-T as the economic assessment is not being progressed specifically to meet a mandated reliability standard but by the net benefits that are expected to be generated for end-customers.

## **No submissions received in response to the Project Specification Consultation Report**

We published a Project Specification Consultation Report (PSCR) on 2 April 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.

On 21 September 2023, the National Energy Laws were amended to reflect the incorporation of emissions reductions within the National Energy Objectives (NEO).<sup>3</sup> Following this, the AEMC made harmonising changes to the National Electricity Rules, prompted by a rule change request from energy ministers, to ensure that network investment and planning frameworks are consistent with the new emissions reduction objective. The AEMC's Final Determination, published on 1 February 2024, included introducing a 'changes in Australia's greenhouse gas emissions' as a new class of market benefit to be considered within the RIT-T process.<sup>4</sup>

Transgrid supports greater consideration of emissions reduction within network planning and investment frameworks. These changes enable network planning and investment frameworks to support the achievement of the Commonwealth Government's net zero targets. Transgrid has set our own science-based targets to cut emissions and decarbonise our business. These include:

- Reducing Scope 1 and 2 emissions by 60 per cent by 2030, compared with a base year of 2021 and net zero by 2040.
- Reducing Scope 3 emissions from Purchased Goods and Services, and Capital Goods by 48 per cent for every million dollars that we spend on these two categories by 2030, compared with a base year of 2021, and net zero by 2050.<sup>5</sup>

For this RIT-T assessment, we do not consider there to be any material change to greenhouse gas emissions under the preferred option. Therefore, we have not undertaken modelling of this market benefit for this assessment as there would be no change to the outcome of the RIT-T.

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<sup>3</sup> Statutes Amendment (National Energy Laws) (Emissions Reduction Objectives) Act 2023 (SA).

<sup>4</sup> AEMC, Harmonising the national energy rules with the updated national energy objectives – Final determination, 1 February 2024 ([https://www.aemc.gov.au/sites/default/files/2024-01/final\\_determination.pdf](https://www.aemc.gov.au/sites/default/files/2024-01/final_determination.pdf)).

<sup>5</sup> For more information on Transgrid's planned journey to net zero please see our website here: <https://www.transgrid.com.au/about-us/our-approach/our-journey-to-net-zero>

## Credible options considered

We consider that there are two credible network options that meets the identified need from a technical, commercial, and project delivery perspective.<sup>6</sup> These options are summarised in the table below. A list of the specific assets with deteriorating condition to be addressed under Option 1 and Option 2 is included in section 3.2 and 3.3, respectively.

Table E-1 Summary of the credible options

Option	Description	Capital costs (\$M, 2023/24)	Operating costs (\$/yr, 2023/24)
Option 1	Replacement of the Molong No.1 transformer	7.08	1,076
Option 2	Refurbishment of the Molong No.1 transformer	1.29	1,614

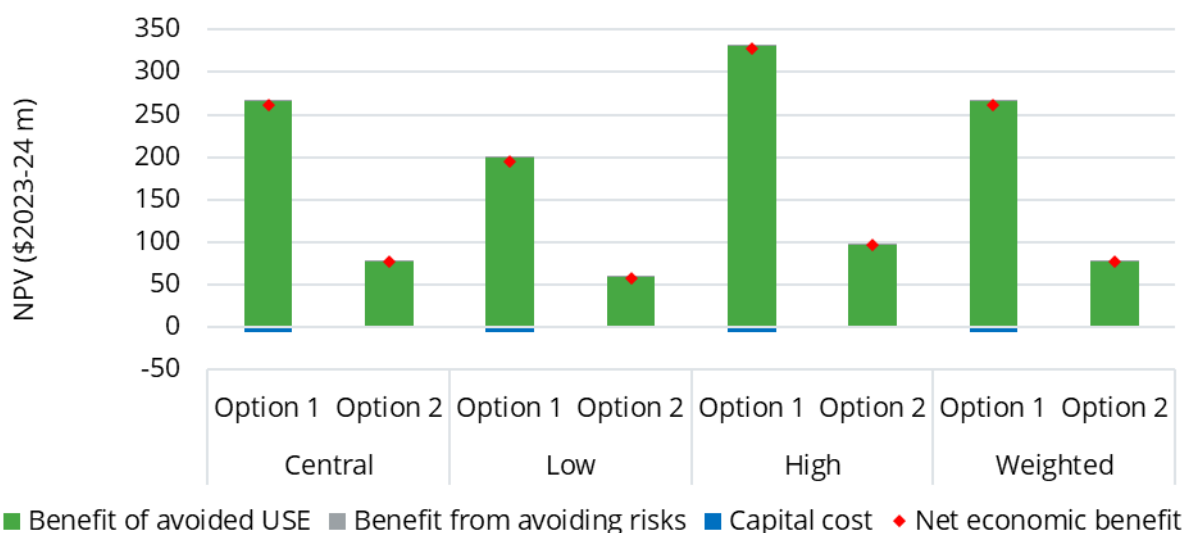
## No submissions received in relation to non-network options

In the PSCR, we noted that we do not consider non-network options to be commercially and technically feasible to assist with meeting the identified need for this RIT-T. Non-network options will not mitigate the expected lost load, safety risks and environmental risks from failure of the No. 1 transformer. No submissions were received in response to the PSCR in relation to non-network options.

## Option 1 delivers the highest net economic benefit and will meet NER requirements

We have assessed that Option 1 is the best performing option under all three reasonable scenarios considered in this PACR. On a weighted basis, where each scenario is weighted equally, Option 1 is expected to deliver net benefits of approximately \$261.22 million.

Figure E-1 NPV of net economic benefits (\$2023/24 m)



<sup>6</sup> As per clause 5.15.2(a) of the NER.

## Conclusion

This PACR finds that Option 1 is the preferred option to address the identified need. Option 1 involves replacement of the No.1 Transformer at Molong substation due to the transformer having reached the end of its technical life.

The capital cost of this option is approximately \$7.08 million (in \$2023/24). The work will be undertaken over a single year with all works expected to be completed by 2025/26. Routine operating and maintenance costs are estimated at approximately \$1,076 per annum (in \$2023/24).

## 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. It follows a PSCR released on 2 April 2024. No submissions were received in response to the PSCR.

The second step of the RIT-T process, production of a Project Assessment Draft Report (PADR), was not required as Transgrid considers its investment in relation to the preferred option to be exempt from that part of the RIT-T process under NER clause 5.16.4(z1). Production of a PADR is not required due to:

- the estimated capital cost of the preferred option being less than \$46 million;
- the PSCR stating:
  - 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 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 identifying additional credible options that could deliver a material market benefit; and
- the PACR addressing any issues raised in relation to the proposed preferred option during the PSCR consultation.

Parties wishing to raise a dispute notice with the AER may do so prior to 5 August 2024 (30 days after publication of this PACR). Any dispute notices raised during this period will be addressed by the AER within 40 to 120 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](mailto:regulatory.consultation@transgrid.com.au). In the subject field, please reference 'Molong substation renewal PACR'.