

# Expanding NSW - Queensland Transmission Transfer Capacity

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## Stakeholder webinar

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TransGrid, in partnership with Powerlink, hosted a webinar as part of the engagement for the Regulatory Investment Test for Transmission (RIT-T) process on expanding transmission transfer capacity between New South Wales (NSW) and Queensland via the interconnector (QNI). The webinar provided an overview of the Project Assessment Draft Report (PADR), the preferred option and modelling. It also provided stakeholders and interested parties with an opportunity to have their questions answered.

## Questions and answers

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- 1. Is Option 5 (BESS A/B) assessed as a network option? What about non-network proposals submitted? To what extent were/are these being evaluated given the AER's preference for non-network solutions where possible?**

The RIT-T is a cost-benefit analysis which identifies a preferred option to meet an identified network need. The RIT-T process does not give preference to technology type or ownership, and network and non-network options are considered on an equal footing under the Rules. TransGrid and Powerlink have assessed the battery options (40MW and 200MW) as both a network option (TNSP owned) and a non-network (proponent owned) option.

For the network option, these cost benefits were assessed based on the capital cost and operating cost of the battery solution. For the purpose of reporting costs in the PADR, independent sources based on Bloomberg, Aurecon and AEMO estimates were used. This protects commercial in confidence for the purpose of the RIT-T process. Hence, the information presented in the PADR is based on standardised cost. The non-network options were also assessed as they have been submitted, with the ownership, the location and models referenced in the appropriate submission/s.

The RIT-T process is specific on options that can be evaluated ie. they must be both technically and economically feasible. For a battery option to be technically feasible, it needs to include battery, network connection, and all other plants and systems that are required for a fully functioning solution. Therefore for the non-network solution, these costs were included when necessary, depending on the nature of the solution. The communication and control system were included, noting that the limits being considered on QNI are complex and have a number of variables that are remote from QNI that also need to be evaluated. Every non-network proposal received has been evaluated on its own cost and on the submission received. In order to evaluate as a feasible option, the analysis included ensuring the option will work in the power system as a whole.

In terms of non-network options, we have assessed these on the cost basis as submitted by the proponent. However, for commercial in confidence reasons, we are unable to publish those assessments. The analysis shows though that these do not change the ranking of the preferred option.

## 2. Have you considered a combination of 1B and 1D?

Option 1B is the uprating of the transmission lines between Liddell and Tamworth and Option 1D is the extension of Sapphire substation to cut into QNI and establishment of the mid-point between Dumaresq and Bulli Creek. At the power system analysis level over different combinations of options, we see that the combination of Option 1B and 1C shows capacity improvement to complement each other among the different types of limits, primarily the thermal and voltage limits. We have seen merits in combining option 1B and 1C providing higher benefits than the sum of the benefits of each option individually, i.e. benefits are super-additive. With Options 1B and 1D, capacity improvements are not expected to complement each other to the same extent.

## 3. Can you predict the impact on MLFs in each of the states under the preferred option?

Yes, the forecast MLFs in each state have been incorporated within the market simulations. The process is outlined in Section 3.1.2 of the market modelling report. The modelling focused on capturing the impact of MLFs on investment patterns. The changes to MLFs between options are relatively small, because all options do not involve additional conductor (or transmission circuits). However the analysis did show that MLFs will decline in more remote areas in future years. This is reflected in the build locations towards more centrally located areas e.g. Central NSW (NCEN) in the modelling.

The final year for the computation of loss factors is 2030-31, as at this point significant REZ transmission upgrade costs have been incurred as part of the least-cost generation development plan. Past this point, there is insufficient detail to reflect transmission upgrades in the network and differences in investments have a lesser significance, so the MLFs are retained as constant. However, the effect of losses were captured through dynamic loss equations between the two zones in Queensland (NQ/CQ and SQ) and the four zones in NSW (NNS, NCEN, CAN, SWNSW) which were in place across the full study period.

## 4. Will a solar/wind/battery connection along the QNI corridor displace the benefit of QNI reinforcement mentioned here.

That could potentially impact the benefits. To minimise this risk, TransGrid and Powerlink have considered committed and anticipated projects in both NSW and Queensland. They are included in the base case and with each of the options in every scenario.

## 5. What is the most amount of forecast increased wind generation if the preferred option proceeds? If it is greater than the interconnector capacity increase, why does this occur?

The relevant figures are in the published workbooks. It will show the increase in Queensland in capacity terms. The charts used in the webinar presentation are for generated energy.

The workbooks show in the Neutral scenario, the largest increase in Queensland wind capacity with Option 1A is 243MW. However, it occurs at the same time as decreases in Queensland of 124MW in Open Cycle Gas Turbine (OCGT) capacity and 53MW in large scale battery storage capacity. The change in nameplate capacity of wind generators due to the augmentation can be greater than the change in nominal limit change because:

- it is offset by decreases in other generator types (as in the Neutral scenario)
- it is able to generate at full capacity at times other generators are not (e.g. low solar times) and form part of the least-cost capacity mix on that basis.

**6. Question regarding the very high forced outage rates in the market modelling as compared to AEMO data. Reference p30 of the EY report. Please explain.**

The forced outage rates published in EY report section 6.2 on page 30 were chosen to obtain greater granular station specific data, which is important in such an assessment. The numbers are based on historical analysis of the outage rates of coal units over the past 5 years. EY looked at zeros in the availability of NEM data and subtracted the maintenance rates that AEMO used for coal units (20 days/unit/year), and the remainder are assumed to be the full forced outages.

Partial outage deratings and rates were based on AEMO values as referenced in the market modelling report.

**7. Will the preferred option improve Renewable Energy Zones (REZ) capacity along the QNI route?**

Yes, to a minor degree. The preferred option includes the uprating of the transmission lines between Liddell and Tamworth. This will provide an increase in transfer capacity from northern NSW towards the NSW major load centres. The line upgrade will slightly increase the capacity of a REZ in northern NSW. Within the QNI PSCR, we did propose a couple of major QNI development options, which we are not considering in this PADR as per the AER's guidance. Those larger upgrades will provide a more substantive increase in capacity between northern NSW and major load centres, and we will consider them in a subsequent RIT-T process.

**8. Will the spending of \$150M be able to facilitate more renewable connections rather than reinforcing the QNI. It makes more sense for renewable energy development.**

A RIT-T tests a specific investment with the counterfactual (ie. without the investment). It tests a range of options to solve the identified need. The test is based on a least net cost investment and assumes transmission required for expansion of REZs will be the subject of a separate investment process (e.g. a different RIT-T).

The RIT-T cost-benefit analysis is 'neutral' in nature (does not favour generation or transmission) and takes into consideration the anticipated and potentially diverse financial outcomes of proposed investments (network or non-network) to the whole of the NEM – i.e. all those who produce, consume and transport electricity. This RIT-T is seeking to establish whether there are economic benefits in upgrading the transmission transfer capacity of QNI regardless of the type of technology used and geographic boundaries crossed. In this case, as this is a 'market benefits' driven RIT-T, if proposed investments were not found to be beneficial, they could not proceed as a regulatory investment or receive regulatory funding.

For reference, the 2018 ISP features both interconnector upgrades and REZ in various groups of priority. We are involved in the work AEMO is currently undertaking in consulting on the development of the 2019/20 ISP. The draft ISP will be published in December 2019.

**9. Is the \$75M Emerging Energy Program for large storage projects by the NSW Govt being considered in the modelling?**

The Emerging Energy Program supports the development of innovative, large-scale technology and storage projects in NSW. This program is therefore not explicitly considered in the market modelling due to its early stage in terms of project scope and commitment. However, proponents may reflect it in costs offered in submissions, subject to confirmation.