

EYRE PENINSULA ELECTRICITY SUPPLY OPTIONS

**Regulatory Investment
Test for Transmission**

Project Assessment Draft Report

16 November 2017

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Cover picture: Electranet transmission tower at the Port Lincoln substation in South Australia

Executive Summary

This report considers the most economic long-term electricity supply solution for the Eyre Peninsula

We understand the importance of a reliable electricity transmission supply to the regional areas of South Australia such as the Eyre Peninsula, and the contribution it makes to both communities and the ongoing economic development of the wider economy.

This Regulatory Investment Test for Transmission (RIT-T)¹ has been initiated to explore electricity supply options for meeting the South Australian Electricity Transmission Code (ETC)² reliability standards for the Eyre Peninsula most efficiently in the future.

Works required to replace components of the existing transmission line in the next few years and the upcoming expiry of the existing backup generation network support arrangement at Port Lincoln provide an opportunity to investigate alternative supply options to the current ageing radial 132 kV network.

In particular, it is timely to assess whether building new higher capacity transmission lines, including over more diverse paths, may result in greater expected net benefits to customers over the long-term, given potential future developments on the Eyre Peninsula. That is, while meeting the ETC reliability standard is the basis of the identified need for this RIT-T, the potential wider market benefits from investing in a more robust network for the Eyre Peninsula means that a broader range of solutions has been considered to meet that need.

Ten variants of five credible options have been assessed, including options for future-proofing the Eyre Peninsula electricity supply

We have investigated ten variants of five broad options for supplying the Eyre Peninsula going forward, which reflect a wide variety of different network capacities and routes.

These options range from:

- maintaining equivalent capacity on the Eyre Peninsula as currently; ie, a single-circuit 132 kV line coupled with network support at Port Lincoln; through to
- upgrading the entire network to 275 kV, with two completely divergent network paths from Cultana to Port Lincoln, in order to provide greater supply reliability.

Three options have been specifically designed for staged development to provide flexibility for potential future mining and/or renewable energy developments on the Eyre Peninsula. Real options analysis was used to estimate the net market benefits associated with the 'future-proof' options, and to compare them with the other investment options.

¹ The RIT-T is the economic cost benefit test that is overseen by the Australian Energy Regulator and applies to all major network investments in the National Electricity Market.

² The Electricity Transmission Code is made by the Essential Services Commission of South Australia (ESCOSA) and specifies required reliability standards at transmission network connection points, including on the Eyre Peninsula.

Building a new transmission line to supply the Eyre Peninsula delivers the most cost effective long-term solution

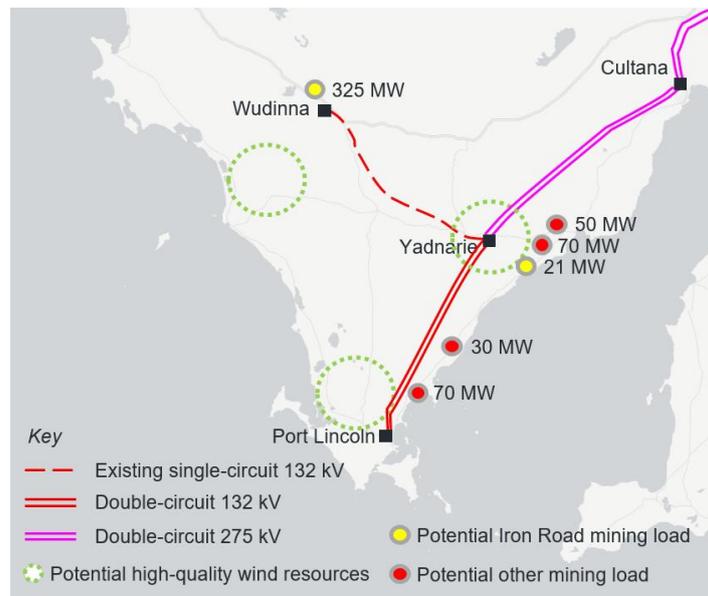
We engaged economic experts HoustonKemp to undertake the economic modelling reported in this Project Assessment Draft Report (PADR).

This assessment identifies that building a new transmission line to supply the Eyre Peninsula is the best option that simultaneously ensures reliable electricity supply to the Eyre Peninsula, consistent with the ETC reliability standards, and delivers the most efficient long-term solution; ie, delivers the greatest net market benefits to customers of the Eyre Peninsula, South Australia and the National Electricity Market.

The highest ranked preferred option (known as Option 4B)³ involves building and operating a double-circuit higher capacity 275 kV line from Cultana to Yadnarie, and a double-circuit 132 kV line from Yadnarie to Port Lincoln, as shown in Figure 1 below.

The estimated capital cost of the preferred option is \$300 million.

Figure 1 – Network configuration under Option 4B and locations of key mining and wind potential



We tested the draft conclusion under a range of alternative assumptions

The conclusion that Option 4B delivers the greatest net benefits has been found to be the case for not only a central set of key assumptions, but also for a range of alternate underlying assumptions regarding the future, as well as numerous sensitivity tests on other key modelling assumptions. Across all reasonable alternate assumptions investigated, Option 4B was consistently found to be the preferred credible option and, in all cases, was found to deliver positive net market benefits.

Even taking the additional benefits provided by the flexible ‘future proof’ options into account, Option 4B remains the preferred option under the RIT-T.

Option 4B would also remain the preferred option in the event that the Iron Road mining development becomes committed prior to the start of construction of this network option. It would also be the preferred option even if additional mining load never located on the Eyre Peninsula.

³ The preferred option is the one that delivers the greatest expected net benefits under the RIT-T economic assessment.

The benefits of most credible options investigated arise from two key impacts of those options on the wholesale National Electricity Market (NEM) – namely:

- changes in fuel consumption arising from different patterns of generation dispatch – in particular, reductions in gas fired generation in South Australia; and
- changes in the timing and type of generation investment – in particular, increasing the efficiency of generation investments, with increased wind farm generation on Eyre Peninsula, reduced wind farm investment in the mid-north region of South Australia, Victoria, and New South Wales, and reduced solar photovoltaic generation capacity in South Australia.

Each of these benefits are expected where credible options allow different patterns of generation dispatch and future construction (and retirement) of generators in the NEM, compared to where the existing single-circuit 132 kV line is retained.

In particular, these benefits are driven by the ability of the credible options to facilitate wind generators connecting on the Eyre Peninsula, which cannot be accommodated under the base case where replacement works are undertaken on the existing limited capacity transmission line.

Customer price impact

The estimated capital cost of the preferred option is about \$220 million more than the ‘business as usual’ base case of replacing components of the existing transmission line and establishing a new backup generation network support arrangement at Port Lincoln. However, the preferred option would remove the need for the backup network support arrangement and therefore save ongoing operating costs of about \$9 million per annum, which are paid for by electricity customers in South Australia.

The preferred option is estimated to deliver net market benefits of \$120 million over 20 years (in present value terms). These benefits are largely driven by wind generation displacing higher-cost gas generation in South Australia, and optimising generation investment across the NEM. As a consequence, South Australia would increasingly be a net exporter of electricity. These factors are expected to place downward pressure on electricity prices in South Australia.

The preferred option is estimated to add less than \$3 to the transmission component of the annual electricity bill for the average residential customer in South Australia⁴.

We seek your feedback on this PADR and its draft finding

We welcome written submissions on the information contained in this PADR. Submissions are due on or before 19 January 2018.

Submissions are particularly sought on the credible options presented, the economic assessment undertaken (and its assumptions and methodology), as well as the draft finding that Option 4B is the preferred option involving a double circuit 275 kV between Cultana and Yadnarie and double circuit 132 kV between Yadnarie and Port Lincoln.

Submissions should be marked “Eyre Peninsula Electricity Supply Options PADR feedback” and emailed to consultation@electranet.com.au.

A Project Assessment Conclusions Report, including final options analysis, is expected to be published in April 2018.

⁴ This estimate has been determined using the Australian Energy Regulator’s Post Tax Revenue Model.

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