

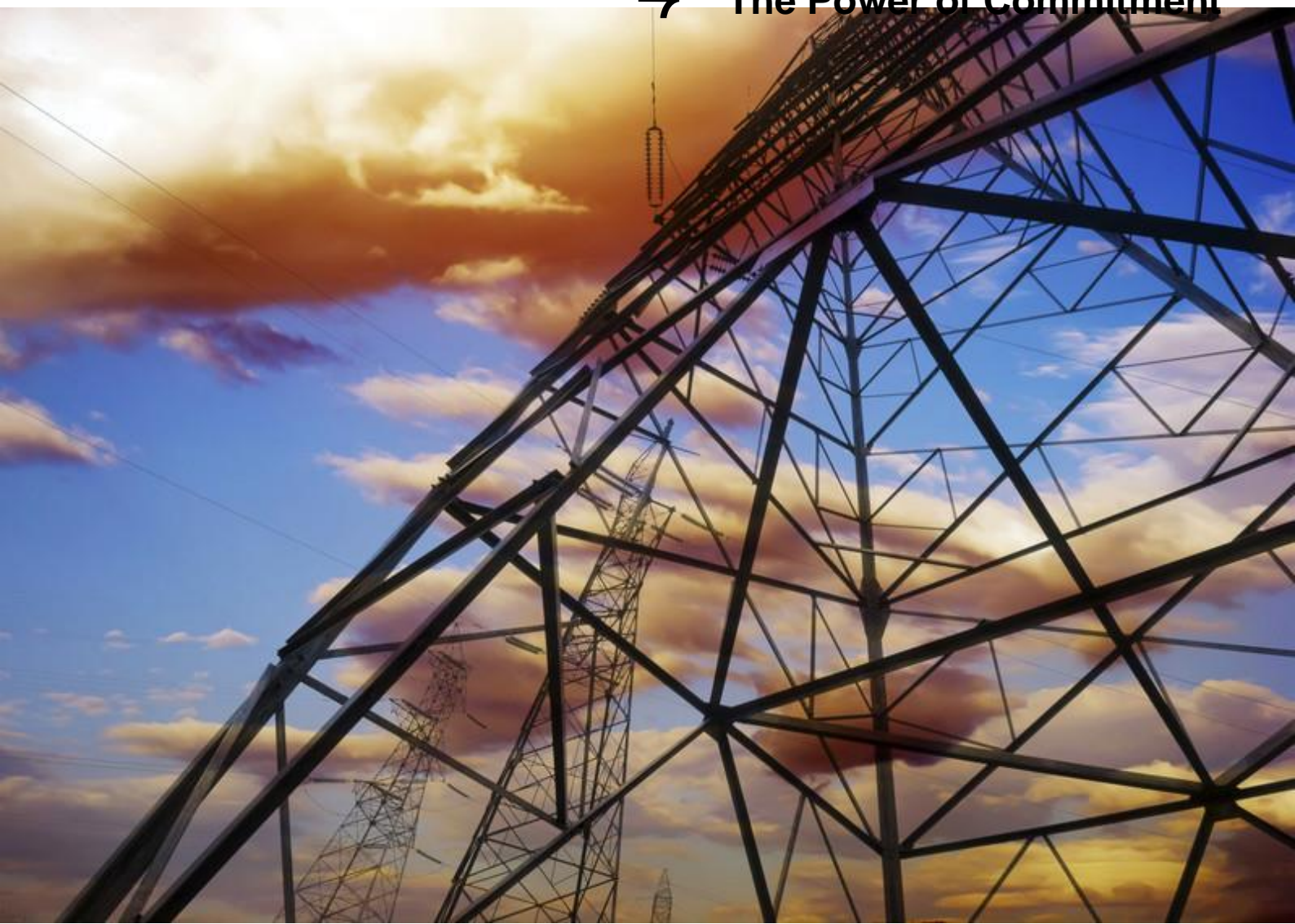
Line 11- Sydney South to Dapto Tower Replacement


Option Assessment

Transgrid

20 October 2022

→ The Power of Commitment



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Executive Summary

Transgrid have refreshed the Option Evaluation Report (OER) 1600 covering Line 11 Sydney South – Dapto – 330kV single circuit steel tower replacement following feedback detailed in the Australian Energy Regulator’s (AER) Draft Determination.

The updated OER addresses the issues raised by the AER with respect to developing a targeted option and considers four options against a base case of doing nothing, where the assets are left in service until they fail and require replacement.

The preferred option “Option D” replace 55 suspension structures identified as having priority condition issues with concrete or steel poles and replace all conductor throughout its 68km route, hardware, fittings and insulators. This is considered a more refined option than the previous recommendation that considered replacing all 127 suspension towers on Line 11, except suspension structures 30 and 129 due to prohibitive site access.

The preferred option has a forecasted capital cost of \$59.6M and a Net Present Value (NPV) of \$258.6M demonstrating proportionality when considering whether the option can demonstrate As Low As Reasonably Practicable (ALARP). This option does not include re-investment within 15 years of the investment. When this is included Option C is preferred, but the difference in the NPV’s between Option D and Option C are within 1% which is considered immaterial.

The options considered addresses the issues raised by the AER with respect to developing a targeted option and the use of Disproportionality Factors (DF) when calculating environmental risks.

The NPV of the options considered are positive after adjusting for DFs when calculating environmental risks, with Option D providing the highest result to support its selection.

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1. Introduction

Transgrid has updated OER 1160 following the AER's feedback on the original submission and has engaged GHD to validate the options assessment used to identify the preferred option.

1.1 Purpose of this report

This report outlines an independent assessment of Transgrid's OER 1600 submitted to the AER for funding associated Line 11 tower replacements, and the corresponding replacement of conductor, earth wire, attachment points and insulators.

This report may be used to support Transgrid's Revised Revenue Proposal to be submitted to the AER.

1.2 Scope and limitations

GHD has been engaged by Transgrid to perform an independent assessment of the OER prepared to support Line 11 tower replacements.

The scope of this report includes an assessment of whether the business case detailed in OER 1160 and the available supporting documentation detailed in Appendix A-1, is in alignment with the AER's Asset replacement planning note¹.

This report has been prepared by GHD for Transgrid and may only be used and relied on by Transgrid for the purpose agreed between GHD and Transgrid as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Transgrid arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

2. Background

The OER 1600 details that 153 of the 154 structures have asset condition issues:

- All 129 suspension towers on Line 11 were identified as having condition issues with the structure and/or other components.
- Conductor condition issues were also identified with Smart Aerial Image Processing (SEIP) inspections being carried out in 2020 identifying multiple issues with conductor along several spans on the line, including broken strands and the presence of possible conductor corrosion (indicated by bulging, visible white product, and discolouration of the conductor).

The original OER considered three options against a base case of doing nothing, where the assets are left in service until they fail and require replacement. The preferred option "Option C" had a forecasted capital cost of \$83.7M with a NPV of \$703.9M. The scope included:

- Replacing all suspension structures with concrete or steel poles except suspension towers 30 and 129 due to prohibitive access issue
- Replacing the existing conductors on the line with twin Olive ACSR/GZ conductor
- Replacing all conductor components, hardware, fittings and insulators

¹ Industry practice application note, Asset replacement planning, January 2019, AER

- Refurbishing the line components on the other remaining structures that have been identified as having condition issues.

The AER's Draft Determination questioned the analysis on the following basis:

- *“Environmental risk is overstated, making up 90% of the total risk costs. Transgrid uses a disproportionality factor of 6, which has a significant impact on the outcome of the NPV analysis.*
- *Transgrid has not adequately explored credible options. For example:*
 - o *The model shows that replacing conductors results in a significant environmental risk reduction relative to replacing structures only. However, Transgrid has not explored any options to replace some or all conductors while replacing only high-risk towers.*
 - o *Transgrid's targeted structure replacement option equates to 40% of the preferred full replacement cost, yet only reduces approximately 30% of the environmental risk. We expect a targeted option will result in a proportionately greater risk reduction than a 'do everything' option²”.*

3. Options assessment

The updated OER considers four options against a base case of doing nothing, where the assets are left in service until they fail and require replacement.

The preferred option “Option D” replace 55 suspension structures identified as having high priority condition issues with concrete or steel poles and replace all conductor components, hardware, fittings and insulators. It includes the replacement of 10 km of earthwire and 68 km of conductor along the route.

OER 1600 details that this option will require the remaining suspension structure to be remediated at later stage beyond the 2024-2028 Regulatory Period which will introduce additional mobilisation/site establishment cost.

The preferred option has a forecasted capital cost of \$59.6M and a NPV of \$258.6M demonstrating proportionality when considering whether the option can demonstrate ALARP. This option does not include re-investment within 15 years of the investment. When this is included Option C is preferred, but the difference in the NPV's between Option D and Option C are within 1% which is considered immaterial.

The options considered addresses the issues raised by the AER with respect to developing a targeted option and the use of DFs when calculating environmental risks.

² AER Draft Decision Attachment 5 Capital Expenditure P21

A-1 Documents considered

- AER - Transgrid 2023-28 - Draft Decision - Attachment 5 - Capital expenditure - September 2022.pdf
- Transgrid - OER-1600 Rev 1 Line 11 Sydney Sth Dapto Twr Repl - 15 Nov 2021 - PUBLIC.pdf
- OER-1600 - Line 11 Refurbishment Rev 3
- 1600 - TL11 - Str 35 - Metallurgy Investigation Report-CONFIDENTIAL.pdf
- 1600 - TL11 - Span 105_Test Report_UNSW-CONFIDENTIAL.pdf
- 1600 - TL 11 - Str 81 - Insulator Review Report-CONFIDENTIAL.pdf
- 1600 - TL 11 - Str 56_Test Report_ UNSW-CONFIDENTIAL.pdf
- Copy of AAIT_RiskModel_Rev0.73_Line 11_OptD Rev 2
- Copy of NPV Analysis Tool - Rev1.1_20221004 Line 11 Rev 2
- Copy of AAIT_RiskModel_Rev0.73_Line 11_OptC_Rev 1
- Copy of AAIT_RiskModel_Rev0.73_Line 11_OptB_Rev 1
- Copy of AAIT_RiskModel_Rev0.73_Line 11_OptA_Rev 1
- Copy of NPV Analysis Tool - Rev1.1_20221004 Line 11 Rev 1
- Copy of AAIT_RiskModel_Rev0.73_Line 11_OptD Rev 1

