

**INQUIRY INTO FEASIBILITY OF UNDERGROUNDING
THE TRANSMISSION INFRASTRUCTURE FOR
RENEWABLE ENERGY PROJECTS**

Organisation: Specialist Utility Infrastructure
Date Received: 10 November 2023

Partially
Confidential



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Committee Chair
Ms Cate Faehrmann MLC
Select Committee – Feasibility of Undergrounding Transmission Infrastructure

Dear Ms Faehrmann,

Re: Enquiry into the feasibility of undergrounding the transmission infrastructure for renewable energy projects (the enquiry).

Specialist Utility Infrastructure (**SUI**) & Garde make the following submission in response to the enquiry based on its experience with large scale civil & utility works. This submission is detailed in part and brief elsewhere with the understanding that the requisite terms of reference are addressed.

Executive Summary

Undergrounding of transmission lines is a proven technique in Australia and offers substantially less capital outlay, installation/maintenance risks and reduced delivery timeframes. The terms of reference are addressed in the labelled sections below:

Terms of Reference

Costs, Benefits & Risks.

In August 2022 GHD produced a Cost Estimate Report (**the GHD report**) for Transgrid in connection with the Humelink Project. This report does not attempt to conclude that either overhead or underground is better than the other, rather it concedes that it is high level report and limited desk top study. At times however the report identifies undergrounding as a more expensive option.

A SUI/GARDE review has determined that the costs for undergrounding transmission are significantly overstated in the report (a concession made by GHD also).

Undergrounding costs (using actual data for civil elements plus grossed up estimates for cable supply) are **less than half** of what the GHD report lists.

The additional benefits of undergrounding far outweigh those of overheads as the GHD report articulates (on pages ix and 74 – 83)) save for the assumption that it is more costly. These benefits consider environment, community, maintenance, reliability of power supply and other sub-categories of these such as agriculture, bushfires & electromagnetic fields.



Case Studies & Current Projects

The GHD report considers a number of alternatives and combinations of both. For this exercise the cheapest GHD option for undergrounding was compared to a recent 'like for like' transmission project delivered in Australia. This comparison is set out below:

GHD Report

Underground HVDC	TOTAL CAPEX	\$8.992 Billion (Section 4.1.3)
Civil & Cable Elements	Total Cost	\$2.605 Billion (Section 4.3.2)
	<u>Cost/per metre</u>	<u>\$9,412.00 (Table 4.13)</u>

SUI GARDE Project (X*)

Civil	Cost/per metre	\$1,900.00
Cable Supply & Install	Cost/metre	\$1,200.00
	<u>Combined Cost/per metre</u>	<u>\$4,300.00</u>
	<u>Net Savings per metre</u>	<u>~\$5,000.00</u>

** name withheld for commercial in confidence reasons*

It is clear from the comparative case study that undergrounding represents significant savings and this should support further considerations ahead of the commencement of any procurement process.

Impact on delivery timeframes

Delivery of undergrounding vs overhead can be similar in terms of the delivery programme due largely to the design & manufacture of the cable itself being a long duration. Undergrounding does however have the distinct advantage of decoupling construction from install & commissioning of cable itself. This will allow for rapid construction and/or multiple work fronts and reduce the impost on the areas in which work is performed.

Other Related Matters

Equipment, Technology & Method – Further Opportunities

There remains an option to further reduce costs with the use of innovative trench excavation equipment which will also greatly improve productivity. These machines are able to work in



narrower construction corridors, are in country and are proven on similar scale with numerous rural projects in all terrain types.

Utilising trench spoil as opposed to an engineered backfill will also save project costs. Trencher technology homogenises trench spoil which greatly improves its use as a backfill material without compromising on cable performance or damage risk.

Formal Costing

It is recommended that, for due diligence purposes, entities seeking to deliver transmission projects engage directly with the market to accurately cost undergrounding as an option.

Additional Information

It is noteworthy that there has also been an independent review of the GHD report by Amplitude Consultants. This report has concluded that there are savings of 45% to be realised by undergrounding, this report has been attached for reference.

SUI/GARDE have a presentation prepared for any further engagements in connection with this submission and this steps out in more detail many of the components presented in this document, this presentation is attached for convenience.

Yours sincerely,

Lee McCourt
Director

References & Attachments

- 1) Humelink Project Underground Report 2022 (GHD)
- 2) Amplitude Consultants Report – PAU-REPT-001_Rev 3