

Powerlink Queensland



Summary
Project Assessment Draft Report
6 August 2019
Maintaining reliability of supply between
Clare South and Townsville South

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Summary

Overview

The 132kV network between Collinsville and Townsville was developed in the 1960s and 1970s to supply mining, commercial and residential loads. A parallel 275kV network was developed more than a decade later to reinforce supply into Townsville and far north Queensland.

The main function of the current 132kV infrastructure between Clare South and Townsville South is to provide connections to Invicta Mill and Clare South substations, and to support power transfers in the area, including from renewable generation. This infrastructure consists of two, 132kV single circuit transmission lines between Clare South Substation and Townsville South Substation, each traversing separate routes. The coastal line was established in 1967, and has a tee connection to Invicta Mill Substation. The inland line, established in 1963, carries critical telecommunications traffic for the transmission network via an optical ground wire (OPGW). Due to their deteriorating condition, these 132kV transmission lines are now reaching the end of their technical service life.

Powerlink must address the emerging condition risks on the 132kV Clare South to Townsville South Transmission lines to maintain compliance with the reliability and service standards set out in the National Electricity Rules (the Rules), Powerlink's Transmission Authority and applicable regulatory instruments¹. Therefore, the proposed investment is classified as a 'reliability corrective action'².

This Project Assessment Draft Report (PADR) has been prepared as part of a prescribed process under the Rules for the proposed transmission investment. It contains the results of the planning investigation and the economic analysis of the credible options.

This RIT-T commenced under the September 2017 AER Application Guidelines³. However, Powerlink has elected to use a Base Case in its economic analysis to align with the December 2018 Application Guidelines⁴. As such, the Base Option in the Project Specification Consultation Report (PSCR) has been relabelled as Option 1a in this PADR. All other options remain the same.

A non-credible Base Case has been developed against which to compare credible options

Consistent with the December 2018 RIT-T Application Guidelines, the assessment undertaken compares and ranks the net present value (NPV) of credible network options scoped to address the emerging risks, to a Base Case. The Base Case is modelled as a non-credible option where the existing condition issues associated with an asset are managed via operational maintenance only, resulting in an increase in risk levels as the condition of the asset deteriorates over time. These increasing risk levels are quantified with a monetary value and added to the ongoing maintenance costs to form the Base Case. The Base Case is then used as a benchmark against which to compare and rank the credible options scoped to offset or mitigate the risks, and to ensure ongoing compliance with applicable regulatory and jurisdictional obligations.

Options considered

Powerlink published a PSCR in November 2018 with respect to maintaining reliability of supply between Clare South and Townsville South. The PSCR invited submissions of credible non-network options to replicate the support that the Clare South to Townsville South transmission lines provide Powerlink in meeting the Rule's and Powerlink's Transmission Authority's reliability obligations on an enduring basis.

Powerlink hosted a webinar for interested stakeholders in March 2019 to share key information contained in the PSCR, later than originally planned due to the unprecedented floods experienced by the Townsville community and customers and impact upon stakeholder availability. The original closing date for PSCR submissions was also extended by one month until 18 April 2019.

¹ Electricity Act 1994, Electrical Safety Act 2002 and Electricity Safety Regulation 2013

² The Rules clause 5.10.2, Definitions, reliability corrective action

³ AER, Application guidelines, Regulatory investment test for transmission, September 2017

⁴ AER, Application guidelines, Regulatory investment test for transmission, December 2018

Two submissions proposing non-network solutions were received in response to the publication of the PSCR. Following discussions with the proponents, and detailed analysis of their proposals, it was concluded that the solutions offered were not technically feasible due to their inability to meet the network's fault level and voltage control requirements for the area. As a result, they could not be considered as credible options to meet the identified need under this RIT-T. (See Section 4 of this report for further detail.)

Powerlink proposed four credible network options in the PSCR to address the identified condition-based need on the Clare South to Townsville South transmission lines. Option 1a and Option 1 involve retaining the existing 132kV lines between Clare South and Townsville South substations, utilising two alternative life extension strategies. Options 2 and 3 involve two life extension strategies of the coastal line along with decommissioning of the inland line, as well as the installation of an additional 375MVA transformer at Strathmore.

All options extend the life of the 132kV network between Clare South and Townsville South through to 2040, at which time the area's 275kV lines are likely to have reached the end of their technical service life, thereby providing an opportunity to review the configuration of the complete network in the area.

The four credible network options, along with their net present values (NPVs) relative to the Base Case are summarised in Table 1. The absolute NPVs of the Base Case and the Options are shown graphically in Figure 1.

Table 1: Summary of credible network options

Option	Description	Total cost (\$m) 2018/19	NPV relative to Base Case (\$m) 2018/19	Ranking
Maintain existing network topology theme				
Option 1a: 10 year life extension strategy of coastal and inland lines	Repair or replace selected components on the coastal line by December 2021* and inland line by December 2022*	40.83*		
	Repair or replace selected components on the inland line by December 2025†	9.10†	6.76	3
	Repair or replace selected components on the coastal line by December 2031† and inland line by December 2035†	17.04†		
Option 1: 20 year life extension strategy of coastal and inland lines	Repair or replace at risk components and paint all structures on the coastal line by December 2021, as well as repair/replace selected components on the inland line by December 2022*	54.81*	-6.52	4
	Repair or replace selected components and paint all towers on the inland line by December 2025†	24.87†		
Reconfigure network topology theme				
Option 2: 10 year life extension strategy of coastal line with network reconfiguration	Repair or replace selected components on the coastal line, and install a new transformer at Strathmore by December 2021*	28.34*		
	Decommission the inland line by December 2022°	8.22°	14.49	1
	Repair or replace selected components on the coastal line by December 2031†	8.43†		

Option	Description	Total cost (\$m) 2018/19	NPV relative to Base Case (\$m) 2018/19	Ranking
Option 3: 20 year life extension strategy of coastal line with network reconfiguration	Repair or replace at risk components and paint all structures on the coastal line and install a new transformer at Strathmore by December 2021*	42.32*	8.46	2
	Decommission the inland line by December 2022 [°]	8.22 [°]		

* Proposed RIT-T project

† Modelled Capital projects

[°] Operational project

It should be noted that the options described in Table 1 result in different network configurations by December 2022. Options 1a and 1 maintain the existing network topology, while options 2 and 3 result in the existing inland line being decommissioned and the required system strength and voltage control being provided by installing a second transformer at Strathmore. All options and their resulting network configurations, continue to meet system standards and provide the required services, to the Townsville South, Clare and Proserpine areas.

Figure 1: NPV of Base Case and Options (\$m, 2018/19)

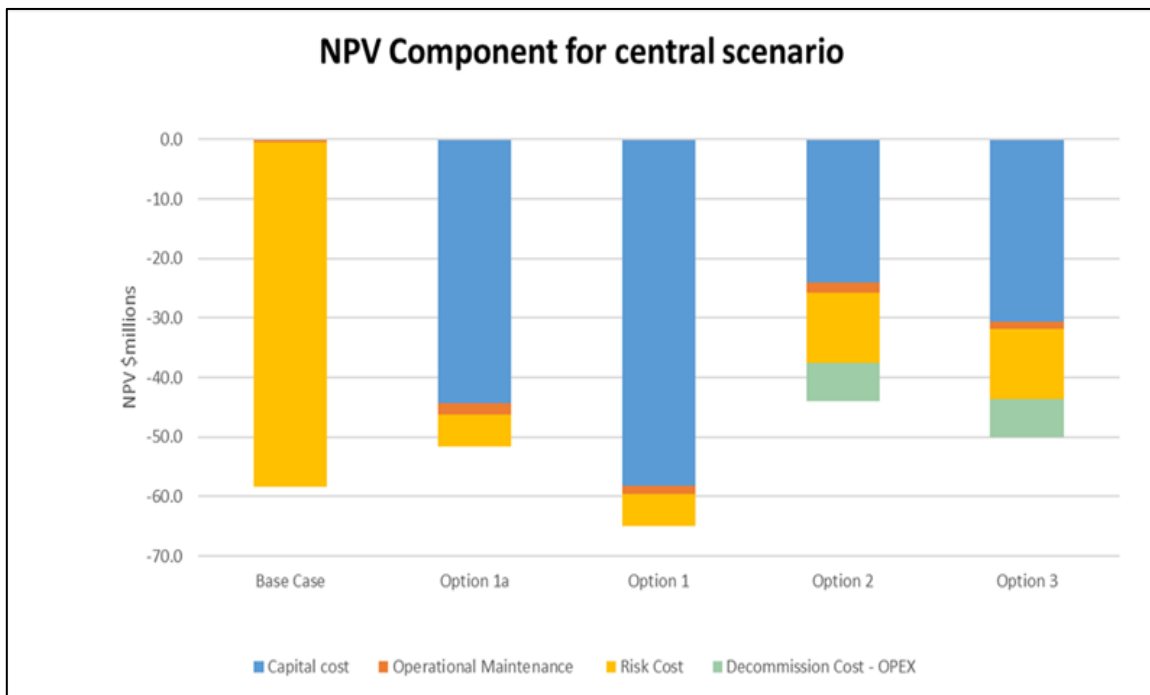


Figure 1 shows the breakdown of the absolute NPV of the Base Case and the four credible options calculated over a 20 year analysis period. The Base Case and options all have a negative NPV. All options reduce the total risks arising from the ageing and obsolete assets remaining in service (as occurs in the Base Case) and all, except Option 1, reflect a net economic benefit when compared to the Base Case.

Taking into account capital, operational maintenance and risk costs, Option 2 delivers the greatest net economic benefit, providing a \$14.49 million reduction in the overall costs in NPV terms when compared to the Base Case over the 20 year analysis period.

Option 2 has been identified as the preferred network option

The RIT-T project for Option 2 involves the repair or replacement of selected components on the coastal 132kV line from Clare South to Townsville South, and the installation of a new 375MVA 132/275kV transformer at Strathmore by December 2021. (This allows for a separate operational project to decommission the inland line to be completed by December 2022).

The indicative capital cost of the RIT-T project for the preferred option is \$28.34 million in 2018/19 prices.

Under this option, design will commence in late 2019 and construction in early 2020. Installation of the new transformer at Strathmore and the life extension of the coastal transmission line will be completed by December 2021.

The staged approach of this option allows for a further review of the risks arising from the condition of the coastal line remaining in service, prior to undertaking the subsequent life extension stage currently forecast to be required by December 2031. This will confirm if the need for remedial action is still required at that point in time.

Powerlink will:

- review and refine the timing of subsequent stages of this option, if required, based on future condition assessments of the risks arising from these lines remaining in service
- review and realign the strategy of the anticipated subsequent stages of this option, if required, based on future network topology requirements to meet forecast demand in the Townsville South, Clare and Proserpine areas and
- undertake any necessary additional regulatory consultations at the appropriate time for future investments if required.

Powerlink welcomes the potential for non-network options to form part or all of the solution

Notwithstanding the non-network solutions assessed as non-credible in this PADR, Powerlink welcomes submissions from proponents who consider that they could offer an alternative credible non-network option that is both economically and technically feasible by December 2021⁵, on an ongoing basis.

Lodging a submission with Powerlink

Powerlink is seeking written submissions on this Project Assessment Draft Report by Monday 23 September 2019, particularly on the credible options presented⁶.

Please address submissions to:

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⁵ This date is based on the non-network solution facilitating the removal of the inland line.

⁶ Powerlink's website has detailed information on the types of engagement activities, which may be undertaken during the consultation process. These activities focus on enhancing the value and outcomes of the RIT-T engagement process for customers and non-network providers.



Contact us

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