Powerlink Queensland

Summary
Project Assessment Conclusions Report

3 June 2022

Maintaining reliability of supply in the Cairns region Stage 1

Addressing the condition risk of the transmission towers between Davies Creek and Bayview Heights

Summary

The bulk supply of electricity to the Cairns region in Far North Queensland is provided by generators in Central and Northern Queensland, via a 132kV coastal network and a 275kV inland network, as well as a hydro power station north of Cairns at Barron Gorge, which is connected to the 132kV network.

The majority of supply to the Cairns region is delivered through the inland 275kV network to Ross, near Townsville. From Ross it is transferred via a 275kV transmission line to Chalumbin, continuing via a second 275kV transmission line from Chalumbin to the Woree Substation on the outskirts of Cairns. These 275kV transmission lines also provide connections to the Mt Emerald Wind Farm and Kareeya Power Station.

The 275kV transmission line between Ross and Chalumbin substations was constructed in 1989, is 244km in length and for the majority of its route, lies to the west of the Great Dividing Range.

The Chalumbin to Woree section of the transmission line was constructed in 1998 and is approximately 140km in length. While the condition of the majority of this line is consistent with its age, it is not the case for the final 16km into Cairns, which is in a deteriorated condition. This section of the transmission line, which traverses the environmentally sensitive World Heritage Wet Tropics area terminating near Trinity Inlet Marine Park, has required a comprehensive ongoing maintenance program due to its heightened exposure to highly corrosive coastal winds.

Emerging condition risks due to structural corrosion on the 275kV transmission lines between Ross, Chalumbin and Woree substations require action to maintain reliability of supply in the Cairns region by December 2026.

Powerlink has identified an opportunity to apply a staged approach

Given the non-homogenous condition of the approximately 384km of 275kV transmission lines supplying the Cairns region, Powerlink identified an opportunity to optimise potential reinvestments by applying a prudent and staged approach to address higher risk components in the nearer term based on deteriorating condition.

In particular, the deteriorating condition of 16km of the 275kV Chalumbin to Woree transmission line, from Davies Creek to Bayview Heights, in the government gazetted Wet Tropics World Heritage Area, poses a risk to the ongoing safe and reliable supply of electricity to the Cairns region. The existing 37 steel lattice towers require priority action to address their more complex and advanced condition risks and have been proposed under Stage 1 of this RIT-T (Addressing the condition risks of the transmission towers between Davies Creek and Bayview Heights).

The section of the transmission line between Ross and Chalumbin is deteriorating at a slightly slower rate due to its location on the western side of the Great Dividing Range. The potential reinvestment for this section is not anticipated until around 2026-27 and will be assessed under a subsequent Stage 2 RIT-T (Maintaining reliability of supply in the Cairns region).

Stage 1: *Addressing the condition risks of the transmission towers between Davies Creek and Bayview Heights* by 2023

As the identified need for the proposed investment is 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 instruments[1], the proposed investment is classified as a 'reliability corrective action'[2].

This Project Assessment Conclusions Report (PACR) represents the final step of the RIT-T process prescribed under the Rules undertaken by Powerlink to address the condition risks arising from the deteriorating condition of the steel lattice towers between Davies Creek and Bayview Heights. It contains the results of the planning investigation, cost benefit analysis of credible options and identifies the preferred option.

[1] Electricity Act 1994, Electrical Safety Act 2002 and Electricity Safety Regulation 2013
[2] The Rules clause 5.10.2, Definitions, reliability corrective action

Credible options considered

Powerlink has developed two credible network options to maintain the existing electricity services, ensuring an ongoing reliable, safe and cost effective supply to customers in the area. The major difference between the credible options relates to a 'with' or 'without' approach to repainting of the 37 steel lattice towers between Davies Creek and Bayview Heights.

Powerlink published a Project Specification Consultation Report (PSCR) in March 2021 with respect to maintaining reliability of supply in the Cairns region – Stage 1. No submissions were received in response to the PSCR that closed on 8 July 2021. As a result, no additional credible options have been identified as a part of this RIT-T consultation.

The two credible network options, along with their net present values (NPVs) relative to the non-credible Base Case are summarised in Table 1. Overall Option 2 results in the greater value in NPV terms and is ranked first.

Table 1: Summary of credible network options

Option	Description	Total costs ($m, 2020/21)	NPV relative to base case ($m, 2020/21)
1	Replace critical components displaying advanced and early onset of corrosion by December 2023*	20.23	47.62
	Replace critical components displaying early onset of corrosion by 2033†	29.73	
	Replace critical components displaying early onset of corrosion by 2038†	23.25	
	Replace critical components displaying early onset of corrosion by 2043†	9.25	
2	Replace critical components displaying advanced corrosion and repaint towers by December 2023*	38.37	55.18
	Repaint of selected structural components and minor works by 2039†	5.38	

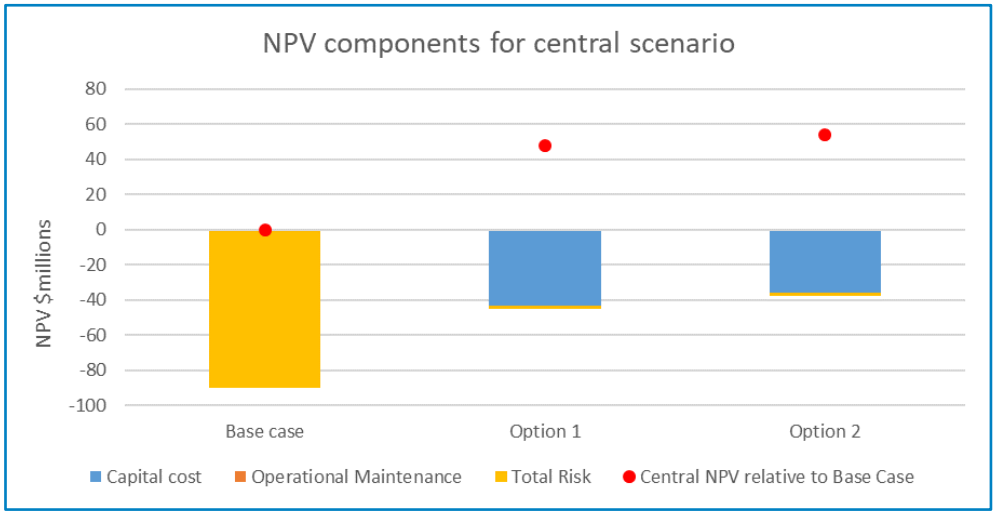
*RIT-T Project
†Modelled network projects including future RIT-T consultations

By addressing the condition risks, both options allow Powerlink to meet the identified need and continue to meet the reliability and service standards set out in the National Electricity Rules (the Rules), Powerlink's Transmission Authority and applicable regulatory instruments[3]. As a minimum, both options achieve a further 25 years asset life and reduce the risk costs compared to the Base Case.

Figure 1 illustrates that by reducing the risk costs arising from the condition of the 37 towers between Davies Creek and Bayview Heights, both credible options have a positive NPV relative to the Base Case, with Option 2 providing the greatest reduction in risk costs.

[3] Electricity Act 1994, Electrical Safety Act 2002 and Electricity Safety Regulation 2013 (See Appendix 2 for further detail)

Figure 1: NPV of Base Case and Credible Network Options



Evaluation and conclusion

The RIT-T requires that the proposed preferred option maximises the present value of net economic benefit, or minimises the net cost, to all those who produce, consume and transport electricity. The economic analysis demonstrates that Option 2 provides the greatest net economic benefit in NPV terms and is therefore the preferred option.

In accordance with the expedited process for the RIT-T, the PSCR made a draft recommendation to implement Option 2, which involves the refurbishment of the 37 towers through the selective replacement of corroded members and components, along with the painting of all 37 towers by December 2023. The indicative capital cost of the RIT-T project for the preferred option is $38.37 million in 2020/21 prices. Powerlink is the proponent of this network option.

Under Option 2, consultation and joint planning with Wet Tropics' stakeholders will be undertaken in late-2022, with contractors deployed to site in 2022/23 and work completed by December 2023.

As the outcomes of the economic analysis contained in this PACR remain unchanged from those published in the PSCR, the draft recommendation has been adopted without change as the final recommendation for implementation.

Dispute Resolution

In accordance with the provisions of clause 5.16B.(a) of the NER, Registered Participants, the AEMC, Connection Applicants, Intending Participants, AEMO and interested parties may, by notice to the AER, dispute conclusions in this report in relation to:

- the application of the RIT-T,
- the basis upon which the preferred option was classified as a reliability corrective action or
- the assessment of whether the preferred option has a *material inter-regional impact* or not

Notice of a dispute must be given to the AER within 30 days of the publication date of this report. Any parties raising a dispute are also required to simultaneously provide a copy of the dispute notice to the RIT-T proponent.

Contact us

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