27 APRIL 2026

Maintaining Reliability of Supply to the Atherton Tablelands and Cairns Areas

Summary Project Specification Consultation Report

Summary

Powerlink has identified the need to maintain reliability of supply to the Atherton Tablelands and Cairns areas due to the deteriorating condition and obsolescence of key transmission network assets currently providing electricity services to these areas.

Key transmission network assets impacting reliability

Chalumbin 275/132kV Substation

Chalumbin Substation is located almost 100 kilometres (km) south of Cairns in Far North Queensland (FNQ) and has both 275 kilovolt (kV) and 132kV operating voltages. The site was established in 1988 to help supply load into the Cairns and Atherton Tablelands areas and it also provides the connection point for Kareeya Hydro Power Station. Planning studies confirm there is a long-term requirement to continue to supply the existing electricity services provided by this substation.

Selected 275kV and 132kV primary plant and secondary systems at Chalumbin Substation have been identified as being in poor condition or at the end of their technical service lives, with identified obsolescence issues. The condition of the substation's remaining original primary plant – the equipment through which the electrical power passes – has significantly deteriorated, with a high number of associated defects and obsolescence issues, increasing the risk to supply to connected customers.

Secondary systems are the control, protection and communications equipment that are necessary to operate the transmission network and prevent damage to primary systems when faults on the network occur. Many of the secondary systems at Chalumbin Substation are nearing the end of their technical service lives and have become or are becoming obsolete. They are no longer supported by the manufacturer and have only limited, or no, spares available. Under the National Electricity Rules (NER), Powerlink is required to provide sufficient secondary systems, including redundancies, to ensure the transmission system is adequately protected.

Chalumbin to Turkinje 132kV transmission line

The Chalumbin to Turkinje 132kV transmission line was established in 1986 and consists of 219 towers along a 100km corridor. It is a double circuit 132kV steel tower transmission line operating in an aggressive tropical environment. In particular, the most northerly section (12km from Turkinje Substation) and southerly section (15km from Chalumbin Substation) of the line have been identified to have consistently higher levels of corrosion, increasing the risk of supply to the Turkinje area.

Planning studies confirm there is an enduring need to maintain the supply of electricity currently provided by this transmission line to the Turkinje area.

Maintaining reliability of supply to the Atherton Tablelands and Cairns areas

The condition and obsolescence of key transmission network assets currently providing electricity services to the Atherton Tablelands and Cairns areas present Powerlink with a range of reliability of supply, safety and compliance risks.

Powerlink must therefore take action to:

- avoid the increasing likelihood of loss of power supply arising from failure of the aging equipment at Chalumbin substation and corrosion on the Chalumbin to Turkinje 132kV transmission line; and
- ensure customers are provided with a reliable and safe supply of electricity.

Powerlink is required to apply the Regulatory Investment Test for Transmission

The estimated capital cost of the most expensive credible option to maintain reliability of supply to the Atherton Tablelands and Cairns areas meets the minimum threshold (currently $8 million) to apply the Regulatory Investment Test for Transmission (RIT-T). As the identified need for the proposed investment is to meet reliability and service standards specified within Powerlink's Transmission Authority, guidelines and standards published by AEMO, and Powerlink's ongoing compliance with Schedule 5.1 of the NER, it is classified as a reliability corrective action under the NER. The preferred option may therefore have a net economic cost.

Powerlink has developed a non-credible base case against which to compare credible options

Powerlink has modelled a non-credible option where the asset condition issues are managed via operational maintenance or operational measures only. This would result in an increase in overall risk levels due to continuing deterioration of asset condition and increasing failure rectification timeframes due to obsolescence issues. These increasing risk levels are assigned a monetary value to form the base case.

Powerlink has developed two credible network options to address the identified need

The table below details the credible network options and shows the capital cost breakdown for each option. Both options address the identified condition issues by replacement of assets. The difference is that Option 1 brings forward the replacement of the secondary systems at Chalumbin to realise efficiencies by coordinating this work with the primary plant replacement, with all work completed by 2030. These efficiencies have been reflected in the reduced capital cost for the secondary systems in Option 1. Option 2 addresses the identified condition issues by replacing assets in line with the asset need timing resulting in a staged project completed by 2034. No material change in operating and maintenance costs result from either investment option.

Summary of Credible Network Options

Option	Description	Breakdown of Capital Costs ($m, 2026)	Total Capital Cost ($m, 2026)
1	Undertake targeted work to extend the life of the Turkinje to Chalumbin 132kV transmission lines by 2027.	17.5	74.1
	Replace selected 275kV and 132kV primary plant by 2030.	46.7	
	Replace selected 275kV and 132kV secondary systems utilising the existing control building in conjunction with the primary plant replacement works by 2030.	9.9	
2	Undertake targeted work to extend the life of the Turkinje to Chalumbin 132kV transmission lines by 2027.	17.5	86.5
	Replace selected 275kV and 132kV primary plant by 2029.	46.7	
	Replace selected 275kV and 132kV secondary systems utilising the existing control building by 2034.	22.3	

Note: Total costs exclude risk and contingency.

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

To enhance engagement outcomes, Powerlink proactively applies an engagement strategy to each RIT-T consultation. The scope of engagement activities undertaken is dependent upon various considerations, such as the characteristics and complexity of the identified need and potential credible options outlined in the RIT-T stakeholder engagement matrix.

It is not considered likely that a non-network solution could fully offset the need for this investment. This is because Chalumbin Substation forms a critical part of the 275kV transmission network supplying FNQ and provides the primary connection point for Kareeya Hydro Power Station, which is also required to support system strength.

A non-network solution may be able to partially offset the investment by supplying, for example, the 132kV load at Turkinje Substation (i.e. Atherton Tablelands to Cooktown). To achieve this, the solution would need to supply over 90 megawatts (MW) of delivered demand (150MW underlying demand) and more than 1,700 megawatt hours (MWh) delivered demand (2,250MWh underlying demand) per day on a continuous basis. It would also be required to provide a stable frequency reference and voltage control to support local generation and energy storage systems. Importantly, the solution must meet reliability requirements such that, under a credible contingency, Turkinje Substation would not experience a loss of supply.

Powerlink welcomes submissions from proponents who consider they can offer a non-network option that is both technically and economically feasible on an ongoing basis.

Lodging a submission with Powerlink

Powerlink seeks written submissions on this Project Specification Consultation Report (PSCR), on or before **Tuesday, 24th July 2026**, particularly on the credible options presented in this PSCR. Submissions should be addressed to:

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