Northern Region Development Outlook

6.1 Regional overview
6.2 Regional investment themes
6.3 Central Queensland to North Queensland transmission backbone
6.4 Zone investment outlook
6.5 Far North zone
6.6 Ross zone
6.7 North zone
6.8 Northern Region transmission line refit program
6.9 Northern Region lines approaching end of technical service life

06

This chapter focuses on potential investment opportunities on the transmission network across the 10-year outlook period for the Northern Region within Queensland. It includes information on forecast network limitations, potential network investments, non-network opportunities, and other future developments which could shape transmission network requirements.

Key highlights

- The Northern Region includes the Far North, Ross and North Transmission Annual Planning Report (TAPR) zones.
- The Northern Region remains a key focus area for future transmission investment, driven by asset renewal requirements, the CopperString Project, generation development, industrial electrification, mining growth, and changing power flow patterns.
- The Central Queensland to North Queensland (CQ-NQ) transmission backbone continues to play a critical role in supporting bulk power transfers between Central, North and Far North Queensland, with several future opportunities identified to maintain network reliability and support the efficient and economic operation of the National Electricity Market (NEM).
- The Australian Energy Market Operator's (AEMO) 2026 Integrated System Plan (ISP) identifies the Central to North Queensland Reinforcement (Stage 1) project as an actionable ISP project, for which Powerlink will assess credible network and non-network options via a Regulatory Investment Test for Transmission (RIT-T).
- To reflect the outcomes of the 2026 ISP, in June 2026 Powerlink updated our proposed contingent projects for the 2027-32 regulatory period. We removed stringing the second circuit of the existing Stanwell to Broadsound 275kV double-circuit from the proposed Central Queensland to North Queensland Augmentation contingent project scope. The remaining Central Queensland to North Queensland Augmentation and northern Bowen Basin Reinforcement were retained as proposed contingent projects in the June update, subject to the Australian Energy Regulator's (AER) Final Determination to be published in April 2027.
- Powerlink is progressing the installation of four synchronous condensers identified through the System Strength RIT-T. One synchronous condenser will be installed at Nebo Substation, one at Stanwell Substation, and two at Calliope River Substation.
- Continued reinvestment within the Northern Region is required to address emerging condition and obsolescence risks across ageing transmission network assets to maintain reliability of supply.
- Future transmission augmentation requirements across the Northern Region will continue to be informed by customer commitments, generation development, industrial growth, market conditions and the outcomes of relevant planning and regulatory assessment processes.
- Potential transmission network augmentations and reinvestment within the Northern Region may present opportunities for non-network solutions.
- Powerlink will continue to work closely with customers, AEMO, Queensland Investment Corporation (QIC), Energy Queensland, market participants, industry and government stakeholders, and other interested parties to identify economic network and non-network solutions that maintain supply reliability, support economic development, and deliver value for customers.

6.1 Regional overview

The Northern Region supplies major population centres including Cairns, Townsville and Mackay, supports significant mining and export industries in the Bowen Basin, and hosts a growing portfolio of energy projects. The transmission network also provides an enabling platform for future economic development, electrification of industrial processes, and the integration of new generation.

The CQ-NQ 275kV transmission backbone, spanning from Bouldercombe Substation to Woree Substation, provides the primary bulk power transfer pathway between Far North Queensland, North Queensland and the wider Queensland transmission network. This backbone is supported by an extensive 132kV network that supplies regional communities, industrial customers, ports, mining operations and major load centres across the region.

6.2 Regional investment themes

Three key investment themes are expected to shape transmission network requirements and development within the Northern Region over the 10-year outlook period:

- future development of the North Queensland transmission backbone
- addressing emerging transmission network asset condition and reliability risks
- supporting economic growth and regional energy development.

Future development of the North Queensland transmission backbone

In the near to medium-term, investment in the 275kV transmission backbone is expected to focus on condition driven reinvestment to maintain reliability and capability. Further augmentation of the CQ-NQ backbone may also be required to increase transfer capability and facilitate future generation and load developments where planning assessments identify net market benefits for consumers.

Addressing emerging condition and reliability risks

Transmission infrastructure across the Northern Region has been progressively developed since the 1960s to support regional growth, mining activity and population expansion. Parts of the network are now reaching an age where targeted reinvestment may be required to address emerging condition, obsolescence and compliance risks to maintain safe and reliable operation of the network.

Supporting economic growth and regional energy development

The Northern Region is expected to play an increasingly important role in Queensland's energy future. The Queensland Energy Roadmap outlines a range of opportunities associated with new and existing generation, industrial expansion, mining electrification, the CopperString Project, critical minerals processing and emerging industries which may influence future transmission requirements. The timing and scale of these developments will continue to be monitored through Powerlink's annual planning process including joint planning with Ergon Energy and engagement with QIC.

6.3 Central Queensland to North Queensland transmission backbone

The CQ-NQ transmission backbone comprises the 275kV transmission network extending between Stanwell, Bouldercombe, Broadsound, Nebo, Strathmore, Haughton River, Ross, Chalumbin and Woree substations.

Investment across the CQ-NQ transmission backbone is expected to focus on condition-driven reinvestment to maintain the reliability and capability of the existing network. Augmentation of the backbone may also be required to support efficient and economic market operation, and where planning assessments identify net market benefits for consumers.

The northern network's system security position is a defining feature of this corridor. There are limited synchronous generation sources in North Queensland, and the region has historically relied on system strength provided from Central Queensland. As synchronous generation in Central Queensland is progressively withdrawn, maintaining adequate system strength and inertia in the north will remain an important planning consideration alongside network capability.

6.3.1 Existing and committed developments

Powerlink commissioned the establishment of a third 275kV connection into Woree Substation to maintain supply reliability within Far North Queensland in January 2026. Line refit works on the 275kV transmission lines between Chalumbin and Woree substations (section between Davies Creek and Bayview Heights) have also been completed.

The CopperString Project, being progressed by QIC, will establish a new transmission connection between the Flinders region and the NEM via the Eastern Link between Hughenden and Townsville.

Further information on completed and committed developments is provided in Chapter 10.

6.3.2 Emerging and evolving investment drivers

Several emerging developments have the potential to drive future reinvestment and augmentation requirements across the CQ-NQ transmission backbone.

Industrial growth and electrification

Proposed industrial developments, expansion of existing industrial precincts and the progressive electrification of mining operations may increase electricity demand and influence future transmission network requirements. Key developments being monitored include the Lansdown Eco-Industrial Precinct, expansion of the Townsville State Development Area and mining developments within the northern Bowen Basin.

Emerging asset condition risks and network reliability

As transmission assets across the Northern Region continue to age, reinvestment may be required to address emerging condition, obsolescence and compliance risks. Opportunities may exist to coordinate reinvestment with other network developments to deliver efficient investment outcomes for customers.

Delivering market benefits through network development

Developments such as CopperString combined with future generation and industrial load growth will increase transfers across the CQ-NQ transmission backbone. Subject to further assessment, additional transmission capacity may be required to support economic and efficient market outcomes and deliver net market benefits. Powerlink will continue to work with AEMO, Ergon Energy, QIC and other stakeholders to assess future network needs and economic and efficient investment for the CQ-NQ transmission backbone.

6.3.3 Central Queensland to North Queensland investment outlook

Figure 6.1 provides a geographic overview of potential investment opportunities across the CQ-NQ transmission corridor. Table 6.1 summarises these opportunities and their indicative timing, with further detail provided in the sections that follow. The opportunities do not constitute committed projects and their scope, timing and implementation remain subject to further assessment and decision-making processes.

Investment profiles for projects Powerlink anticipates will be required within five years are included in the five-year investment profile tables following Table 6.1. Other investment opportunities identified in the 10-year outlook are not profiled as their indicative need falls outside the five-year period and are at earlier stages of planning and assessment.

Figure 6.1 Future investment opportunities for the CQ-NQ 275kV transmission backbone

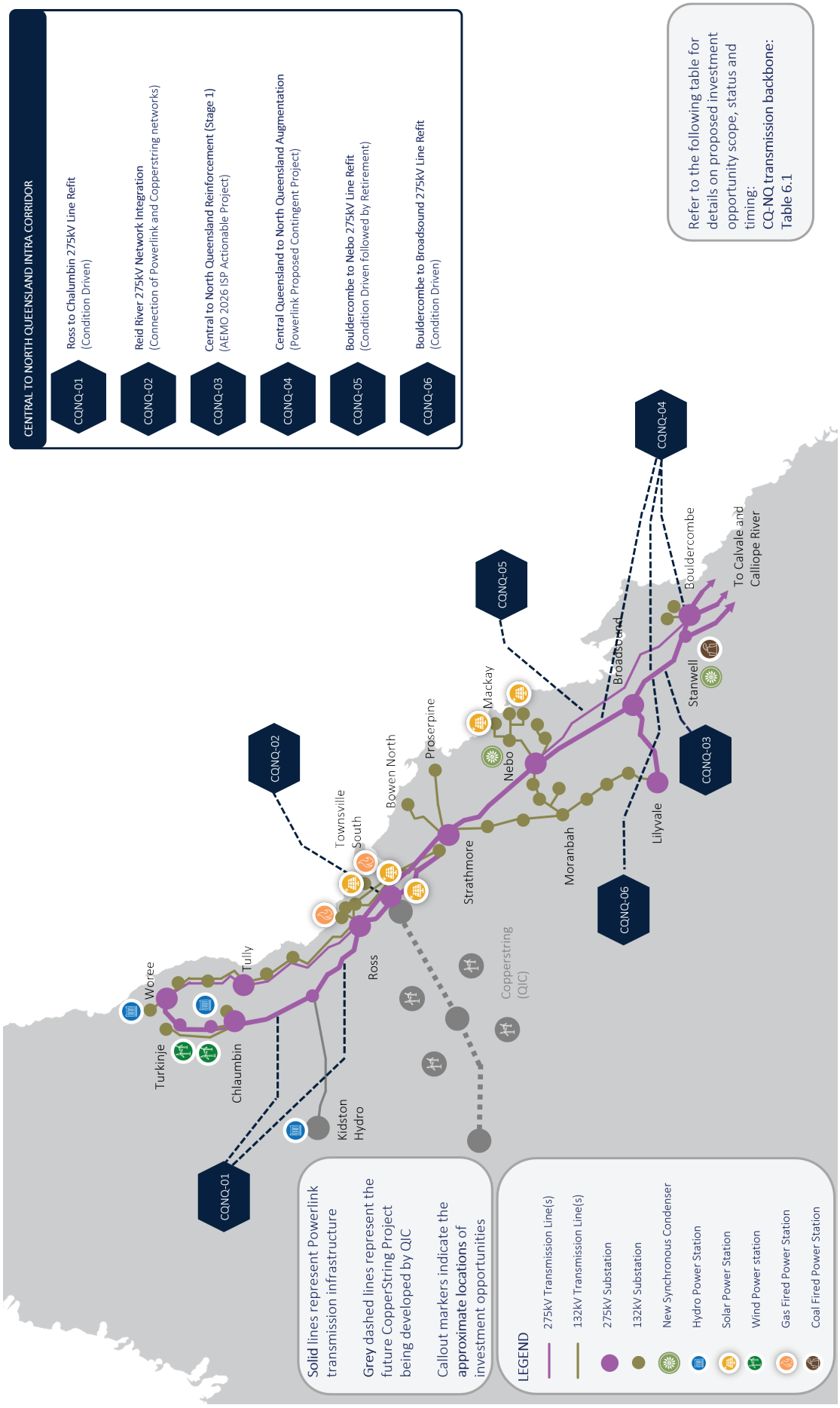


Table 6.1 CQ-NQ transmission backbone future investment opportunities

ID	Potential project	High level scope	Purpose	Indicative timing	Alternatives	Indicative cost	Status
CQNQ-01	Ross to Chalumbin 275kV Refit	Staged line refit works on steel lattice structures	Emerging asset condition and reliability of supply risks	Staged works by June 2031	Refer to Section 6.3.4	$39 million	Uncommitted
CQNQ-02	Reid River 275kV Network Integration (1)	Construction of a new high capacity 275kV double-circuit to cut in to the existing western Strathmore to Ross 275kV transmission line and construction of the Reid River 275kV Substation	Connect CopperString and Powerlink's transmission networks	Required to align with the planned commissioning of CopperString by 2032	Refer to Section 6.3.4	$300 million	Planned
CQNQ-03	Central to North Queensland Reinforcement (Stage 1) (2)	AEMO's 2026 ISP identifies stringing the second circuit of the existing Stanwell to Broadsound 275kV transmission line as the actionable ISP candidate project	Realise net market benefits by increasing transmission capability between Central and North Queensland and potentially enabling access to generation from North Queensland	AEMO's 2026 ISP identifies an indicative delivery by July 2031. The preferred option and optimal timing will be determined through the RIT-T	Other credible options identified through the RIT-T, including staged rebuilds of existing 275kV lines between Bouldercombe and Nebo as described under CQNQ-04 Refer to Section 6.3.4	Dependent on preferred option. AEMO's 2026 ISP indicates a cost of $209 million for the ISP candidate	Progressing through the actionable ISP RIT-T process. PADR required to be published by June 2028
CQNQ-04	Central Queensland to North Queensland Augmentation (2)	This project involves advancing rebuilds of the existing lower capacity overhead 275kV transmission circuits between Bouldercombe, Stanwell, Broadsound and Nebo substations (3)	There may be net market benefits associated with increasing the transfer capability across the CQ-NQ backbone transmission network	Scenario dependent and subject to the optimal economic timing identified through planning and market-benefit assessments	Staged or alternate configurations, including establishment of an adjacent new higher capacity 275kV double-circuit overhead line between Bouldercombe and Nebo substations	$1,795.2 million (2)	Proposed contingent project in Powerlink's 2027–32 Revenue Proposal
CQNQ-05	Bouldercombe to Nebo 275kV Refit	Line refit works on the 275kV transmission line between Bouldercombe and Nebo substations	Emerging asset condition and reliability of supply risks	2032	New 275kV transmission line between Bouldercombe and Nebo substations	$41 million	Uncommitted
CQNQ-06	Bouldercombe to Broadsound 275kV Refit	Line refit works on the 275kV transmission line	Emerging asset condition and reliability of supply risks	2035	Rebuild the 275kV transmission line between Bouldercombe and Broadsound substations	$25 million	Uncommitted

Notes:

(1) Regulatory and cost-recovery treatment remains subject to further assessment.

(2) CQNQ-03 and CQNQ-04 are presented separately to reflect their different ISP classifications. AEMO's 2026 ISP identified CQNQ-03 as an actionable ISP project, and its scope was removed from Powerlink's proposed contingent project in June 2026. The CQNQ-03 RIT-T will assess the ISP candidate project and other credible network and non-network options capable of meeting the identified need for the actionable ISP project. These may include alternative scopes or configurations that incorporate elements of CQNQ-04, where they satisfy the applicable requirements for a credible option. AEMO's 2026 ISP identifies CQNQ-04 as a future ISP project, with timing dependent on the scenario. The final status of this project will be determined as part of the AER's Final Determination on Powerlink's 2027-32 Revenue Proposal to be published in April 2027.

(3) CQNQ-04 represents the scope of Powerlink's proposed Central Queensland to North Queensland Augmentation contingent project set out in the updated June 2026 Appendix 4.04 to Powerlink's 2027–32 Revenue Proposal. It also includes an additional double-circuit 275kV connection from Reid River Substation to the eastern Strathmore–Haughton River–Ross circuit. The reported cost includes this additional scope. The final status of this project will be determined as part of the AER's Final Decision on Powerlink's 2027-32 Revenue Proposal to be published in April 2027.

(4) CQNQ-05 and CQNQ-06 represent initial condition driven refit interventions that may be required, depending on the preferred development pathway and timing for CQNQ-04.

6.3.4 Five-year investment profiles

Powerlink anticipates that three potential network investments above the RIT-T cost threshold may be required across the CQ-NQ transmission backbone within the next five years to address asset condition risks, integrate the Reid River 275kV substation to the Powerlink transmission network and increase transmission capability to deliver net market benefits.

CQNQ-01 Addressing condition risks between Ross and Chalumbin

Item	Description
Location	North Queensland (between Townsville and Cairns)
Asset details	Ross to Chalumbin 275kV overhead transmission line
Investment context	The Ross to Chalumbin 275kV double-circuit line is a key transmission route to Far North Queensland spanning around 244km in length. The overhead line traverses the northern Queensland tropical rainforest passing through environmentally sensitive, protected areas and crossing numerous regional roads and rivers. Delivery of renewal works will be complex and need to be completed outside of summer peak load and the wet season.
Network driver	Condition driven reinvestment to address emerging condition risks associated with the overhead transmission line.
Indicative timing	June 2031
Status	Uncommitted
Proposed network solution	Refit the double-circuit 275kV overhead transmission line between the Chalumbin and Ross substations (via Guybal Munjan Substation) by 2031 at an estimated cost of $39 million.
Other potential network solutions	Other potential network solutions include: 1. Rebuild of the existing Ross to Chalumbin 275kV double-circuit line 2. Restring the existing Ross to Chalumbin 275kV overhead line with higher capacity conductor combined with line refit works 3. Rebuild of the southern section of the 275kV line from Ross to Guybal Munjan substations, and refit of the northern section from Guybal Munjan to Chalumbin substation) 4. Refit and restring with high temperature conductor the southern section of the 275kV line from Ross to Guybal Munjan substations, and refit of the northern section from Guybal Munjan to Chalumbin substations.
Potential non-network solutions	Potential non-network solutions would need to provide injection to the north area of close to 400MW at peak and up to 6,000MWh per day. The network configuration also facilitates generator connections in the area and enables the provision of system strength and voltage support for the region.
Inter-network impact	No material inter-network impact identified.

CQNQ-02 Reid River 275kV Substation and Network Integration

Item	Description
Location	Reid River Substation is located approximately 40km south of Ross Substation in North Queensland
Asset details	The project involves construction of a new high-capacity 275kV double-circuit to cut into the existing western Strathmore to Ross 275kV transmission line and construction of the 275kV substation
Investment context	Reid River Substation will provide the connection point between CopperString and Powerlink's transmission network through a high-capacity 275kV transmission line connection to the Ross to Strathmore 275kV double-circuit transmission line.
Network driver	Facilitate the connection of CopperString and Powerlink's transmission networks
Indicative timing	Initial connection works are required to coincide with the planned commissioning of the CopperString project by 2032
Status	Planned
Proposed network solution	Establish a new high-capacity 275kV double-circuit connection between Reid River Substation and the Ross to Strathmore 275kV double-circuit transmission line to facilitate the connection of CopperString to the Powerlink 275kV transmission network
Other potential network solutions	Establish alternative high-capacity 275kV transmission connections between Reid River Substation and the existing Powerlink 275kV transmission network
Potential non-network solutions	Powerlink has not identified any technically feasible non-network solutions capable of meeting the identified network need
Inter-network impact	The impact of this network development will be assessed against the material inter-network impacts assessment criteria

CQNQ-03 Central to North Queensland Reinforcement (Stage 1)

Item	Description
Location	North Queensland (between Stanwell and Broadsound 275kV substations)
Asset details	Stanwell to Broadsound existing double-circuit 275kV transmission line (currently only one side strung)
Investment context	AEMO's 2026 ISP identifies Central to North Queensland Reinforcement Stage 1 as an actionable ISP project. AEMO identifies stringing the second circuit of the existing Stanwell to Broadsound 275kV double-circuit line as the candidate option. Powerlink will assess this development and other credible network and non-network options under the RIT-T process for actionable ISP projects.
Network driver	The network driver for this project is to deliver net market benefits by increasing transmission capability between Central and North Queensland and enabling greater access to new generation in North Queensland to supply major Queensland load centres.
Indicative timing	Subject to the optimal economic timing identified through market-benefit assessments. AEMO 2026 ISP modelling indicates an anticipated delivery timing around 2031.
Status	Progressing through the actionable ISP RIT-T process with the PADR required to be published by June 2028.
Proposed network solution	Stringing the second circuit of the existing Stanwell to Broadsound 275kV double-circuit transmission line which currently has only one circuit strung at an estimated cost of $209 million. The preferred option and its estimated cost will be determined through the RIT-T assessment.
Other potential network solutions	Other potential network solutions include: 1. Rebuild of the existing Bouldercombe to Broadsound 275kV single circuit line (feeder 820) as a double-circuit 275kV line (via Stanwell or staged initially between Stanwell and Broadsound) 2. Rebuild of the existing Bouldercombe to Nebo single circuit 275kV line (feeder 821) as a double-circuit line between Bouldercombe and Nebo, via Stanwell and Broadsound substations. 3. Other credible network solutions identified through the RIT-T assessment
Potential non-network solutions	Potential non-network solutions will be assessed through the RIT-T, having regard to their ability to address the identified need and deliver net market benefits
Inter-network Impact	Any inter-network impacts with this network development will be assessed as part of the RIT-T for the actionable ISP project

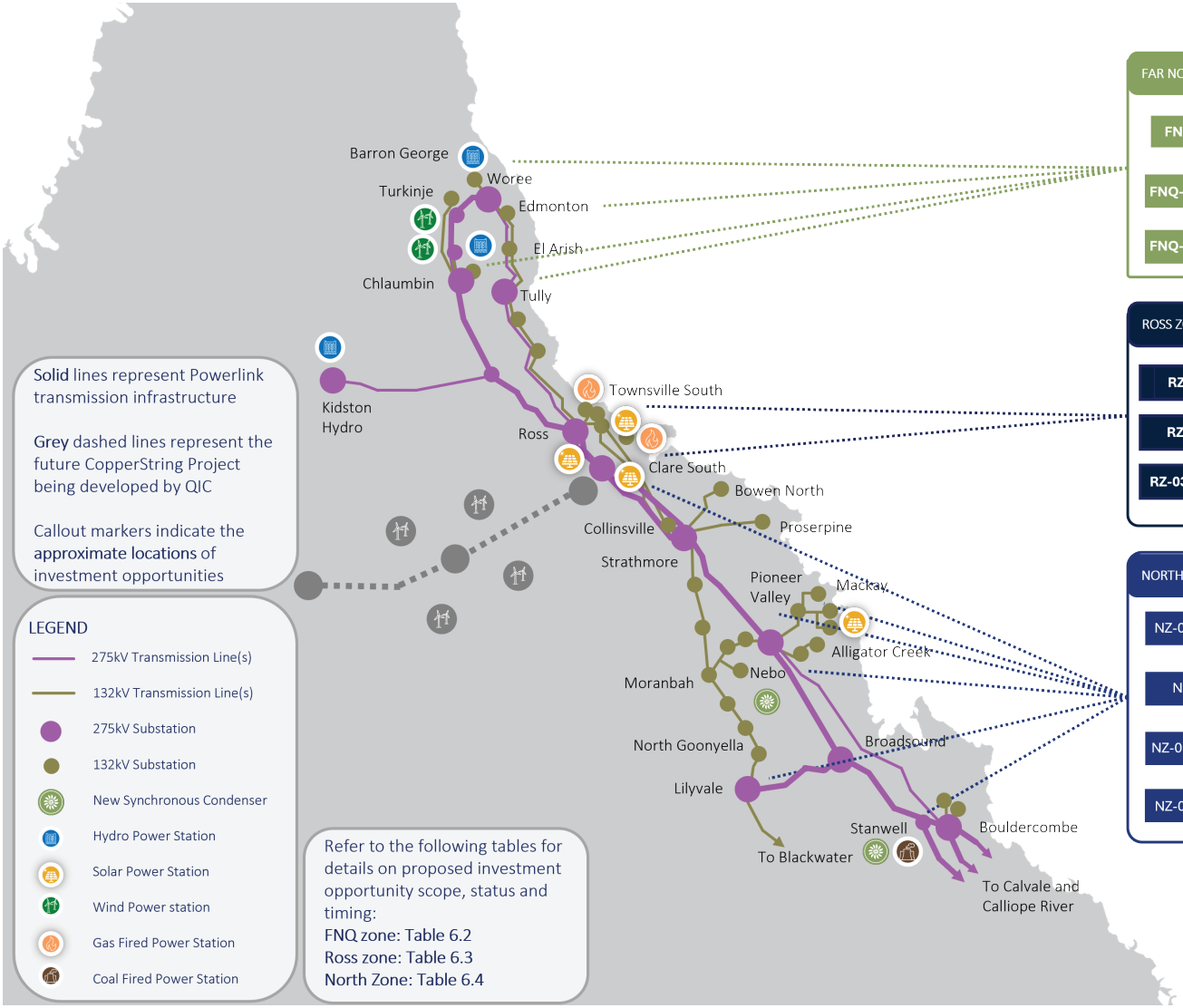
6.3.5 Possible asset retirements

Powerlink has not identified any potential asset retirements across the CQ-NQ 275kV transmission corridor within the 10-year outlook period.

6.4 Zone investment outlook

Figure 6.2 provides a geographic overview of the Far North, Ross and North zones and the potential investment opportunities discussed in sections 6.5 to 6.7. The overview provides context for the zone-based discussion that follows with further information on the scope, timing and drivers for each opportunity provided in the relevant section.

Figure 6.2 Future investment opportunities for the Far North Queensland, Ross and North zones



6.5 Far North zone

The Far North zone extends from Tully in the south to Cairns, the Atherton Tablelands and the northern Beaches in the north. The zone forms the northern-most part of Powerlink's transmission network and is supplied predominantly from the Woree, Chalumbin and Ross substations. The zone provides essential electricity supply to regional communities, tourism precincts, agricultural industries and growing urban centres across Far North Queensland.

Cairns is the principal population centre within the region and serves as the gateway to Far North Queensland and the Great Barrier Reef. Ongoing residential growth, urban expansion and development of major economic precincts, including the Cairns South State Development Area, continue to support increases in electricity demand and broader regional economic activity.

The Far North zone transmission network also supports several important generation assets. Barron Gorge Hydro Power Station, located north of Cairns, contributes synchronous generation and provides valuable voltage support and system security services to the transmission network. Kareeya Hydro Power Station similarly contributes generation capacity connecting to Chalumbin Substation. More recently, additional large-scale wind and pumped hydro generation facilities have been developed within the zone.

The transmission network traverses environmentally sensitive and geographically challenging terrain, including coastal floodplains, tropical rainforest environments and sections of the Wet Tropics World Heritage Area. These factors influence network operation, maintenance strategies and the delivery of future transmission investments.

6.5.1 Existing and committed network developments

Powerlink has completed a range of transmission line and substation reinvestment works, including refurbishment of the Woree Static Var Compensator (SVC), secondary systems reinvestments and targeted line refit programs to address emerging asset condition risks and maintain reliable network operation.

Detailed information on committed developments is provided in Chapter 10.

6.5.2 Emerging and evolving investment drivers

Emerging network capacity requirements in Far North Queensland are expected to be driven by continued residential and industrial growth within the greater Cairns area. The region's tropical coastal environment contributes to elevated asset deterioration with emerging condition and obsolescence risks identified within overhead transmission lines and substations. Targeted reinvestments will be required to address these risks and maintain reliability of supply.

6.5.3 Future network investments and opportunities

Powerlink has identified potential network developments to address emerging network needs and asset condition risks within the Far North Queensland transmission network within the 10-year outlook period. These opportunities are at various stages of development, with some currently progressing through RIT-T assessments.

Table 6.2 summarises these opportunities and their indicative timing, with further detail provided in the sections that follow. The opportunities do not constitute committed projects, and their scope, timing and implementation remain subject to further assessment and investment decision-making processes. It should be noted that the indicative cost of potential projects also excludes known and unknown contingencies.

Investment profiles for projects Powerlink anticipates will be required within five years are included in the five-year investment profile tables following Table 6.2. Other investment opportunities identified in the 10-year outlook are not profiled as their indicative need falls outside the five-year period and are at earlier stages of planning and assessment.

Table 6.2 Far North zone investments within the 10-year outlook period

ID	Potential project	High level scope	Purpose	Indicative timing	Alternatives	Indicative cost	Status
FNQ-01	Line refit works on the 132kV transmission lines between Chalumbin and Turkinje substations and 275kV and 132kV reinvestment at the Chalumbin Substation	Line refit works on the 132kV transmission lines by 2027, replace selected 275kV and 132kV primary plant and 275kV and 132kV secondary systems utilising the existing control building at Chalumbin Substation	Maintain supply reliability to the Far North zone	Staged works by 2030	Refer to Section 6.5.4	$74 million	Currently progressing through RIT-T assessment
FNQ-02	Woree PASS M1 replacement	Replacement of Woree PASS M1 hybrid units	Maintain supply reliability to the Far North zone	June 2028	Replacement of PASS M1 units as dead tank circuit breakers	$9 million	Uncommitted
FNQ-03	Tully 132/22kV transformer replacement	Replacement of the transformer	Maintaining Reliability of Supply at Tully	June 2029	Life extension of the existing transformer	$10 million	Uncommitted
FNQ-04	Woree 275kV and 132kV secondary systems replacement	Selected replacement of 275kV and 132kV secondary systems	Maintain supply reliability to the Far North zone	June 2033	Full replacement of 275kV and 132kV secondary systems	$17 million	Uncommitted
FNQ-05	Barron Gorge 132kV secondary systems replacement	Full replacement of 132kV secondary systems	Maintain supply reliability to the Far North zone	June 2036	Selected replacement of 132kV secondary systems	$3 million	Uncommitted
FNQ-06	Edmonton 132kV secondary systems replacement	Full replacement of 132kV secondary systems	Maintain supply reliability to the Far North zone	June 2032	Selected replacement of 132kV secondary systems	$9 million	Uncommitted
FNQ-07	El Arish 132kV secondary systems replacement	Selected replacement of 132kV secondary systems	Maintain supply reliability to the Far North zone	June 2036	Full replacement of 132kV secondary systems	$10 million	Uncommitted

6.5.4 Five-year investment profile

Powerlink anticipates several potential network investments above the RIT-T cost threshold may be required to address the risks arising from the condition of assets within the Far North Queensland zone within the next five years.

FNQ-01 Maintaining reliability of supply to the Atherton Tablelands and Cairns areas

Item	Description
Location	Atherton Tablelands
Asset details	Chalumbin Substation was established in 1988. The Chalumbin to Turkinje 132kV double-circuit transmission line was constructed in 1986
Investment context	Chalumbin Substation supplies load into the Cairns and Atherton Tablelands areas and provides the connection point for Kareeya Hydro Power Station. The Chalumbin to Turkinje 132kV double-circuit transmission line operates in an aggressive tropical environment. In particular, the most northerly section (12km from Turkinje Substation) and southerly section (15km from Chalumbin Substation) have consistently higher levels of corrosion increasing the risk of supply to the Turkinje area.
Investment driver	Transmission line: Condition driven replacement to address emerging condition risks due to structural corrosion. Substation: Condition driven replacement to address emerging condition, obsolescence and compliance risks on the 275kV and 132kV primary plant and secondary systems.
Indicative timing	December 2030
Status	Current joint RIT-T consultation. PADR submissions close 11 November 2026.
Proposed network solution	Targeted life extension of the Turkinje to Chalumbin 132kV transmission lines by 2027; replacement of selected 275kV and 132kV primary plant by 2030; replacement of selected 275kV and 132kV secondary systems in the existing control building by 2030 at an estimated cost of $74 million
Other potential network solutions	Targeted life extension of the Turkinje to Chalumbin 132kV transmission lines by 2027; replacement of selected 275kV and 132kV primary plant by 2030; replacement of selected 275kV and 132kV secondary systems in the existing control building by 2034 at an estimated cost of $87 million
Potential non-network solutions	Potential non-network solutions would need to supply over 90MW of delivered demand (150MW underlying demand) and more than 1,700MWh 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.
Inter-network impact	This network development is not anticipated to have material inter-network impacts

FNQ-02 Maintaining reliability of supply at Woree

Item	Description
Location	Cairns area
Asset details	PASS M1 hybrid modules were installed in 2002
Investment context	Woree 275/132kV was established in 2002 to support load growth in Cairns and Far North Queensland and provides essential reactive power support and voltage regulation in the area
Investment driver	Emerging condition risks for two PASS M1 hybrid units impacting compliance with system standards
Indicative timing	June 2028
Status	Uncommitted
Proposed network solution	Condition driven replacement of PASS M1 hybrid units by June 2028 at an estimated cost of $9 million
Other potential network options	Replacement of two PASS M1 hybrid units with dead tank circuit breakers
Potential non-network solutions	Powerlink does not consider non-network options can meet the identified need to ensure ongoing compliance with Schedule 5.1 as required under the NER
Inter-network impact	This network development is not anticipated to have material inter-network impacts

FNQ-03 Maintaining power transfer capability and reliability of supply at Tully

Item	Description
Location	Tully area (between Cairns and Townsville)
Asset details	Established in 1976
Investment context	Tully 132kV Substation provides supply to the Ergon Energy distribution network in the region south of Innisfail. The associated 22kV network also connects the Tully Sugar Mill (bagasse-fired generation with a capacity of 32.8MW).
Investment driver	Condition driven replacement to address risks on one of the 132/22kV transformers
Indicative timing	June 2029
Status	Uncommitted
Proposed network solution	Replacement of Transformer 2 by June 2029 at an estimated cost of $10 million
Other potential network solutions	Establishment of new El Arish to Tully 22kV distribution line
Potential non-network solutions	Potential non-network solutions would need to provide up to 18MW at peak and up to 275MWh per day on a continuous basis to provide supply to the 22kV network at Tully.
Inter-network impact	This network development is not anticipated to have material inter-network impacts

FNQ-06 Addressing the secondary systems condition risks at Edmonton

Item	Description
Location	South of the greater Cairns area
Asset details	Edmonton Substation, a joint Powerlink Ergon Energy substation, was first established in 1956. Most of the secondary systems were commissioned in 2004.
Investment context	Edmonton 132/22kV Substation provides supply to the Edmonton suburban area and to the south of the city towards Gordonvale. Extensions with load growth have resulted in a mixture of secondary systems from 2000 through to 2008.
Investment driver	Condition driven replacement to address emerging condition, obsolescence and compliance risks on the 132kV secondary systems
Indicative timing	June 2032
Status	Uncommitted
Proposed network solution	Full replacement of the 132kV secondary systems by June 2032 at an estimated cost of $9 million
Other potential network solutions	Selected replacement of 132kV secondary systems
Potential non-network solutions	Potential non-network solutions would need to provide up to 56MW at peak and up to 830MWh per day on a continuous basis to provide supply to the 22kV network within the Edmonton area
Inter-network impact	This network development is not anticipated to have material inter-network impacts

6.5.5 Other potential developments

Continued population growth and urban expansion, particularly within the northern Beaches and southern Cairns growth corridors, are expected to influence future network investment requirements within the Far North zone.

Joint planning with Ergon Energy has identified future requirements for additional distribution injection capacity within the Cairns South area. The proposed solution is to establish a new Transmission Connection Point between Edmonton and Gordonvale via a 132kV substation and associated transmission connections to support the forecast residential, commercial and industrial development.

Acquiring substation site land and associated easements now allows for coordinated development, preserving the ability to secure the necessary easement corridors to support the long-term interests of sustainable development, before development changes land use and removes the preferred option.

Powerlink will continue to monitor these developments through its annual planning process and ongoing joint planning activities with Ergon Energy.

6.5.6 Possible asset retirements

Possible asset retirements include the Cairns 132/22kV Transformer 4, and the existing 132kV transmission line between Woree and Kamerunga (proposed to be replaced by a new 132kV transmission line).

6.6 Ross zone

The Ross zone is centred on Townsville and extends from Ingham in the north to the Haughton River and Collinsville areas in the south. The zone forms an important component of the North Queensland transmission network and plays a critical role in supporting regional communities, industrial development, port operations, and economic activity within north Queensland.

Townsville is one of Queensland's largest regional urban centres and serves as a major commercial, industrial and logistics hub for North Queensland. The region is anchored by the Port of Townsville, which supports significant export activity associated with mining, minerals processing and broader trade throughout northern Australia. The city is also an important centre for defence, health, education and government services, supporting a diverse and growing economy.

The transmission network comprises a combination of 275kV and 132kV infrastructure supplied primarily from the Ross 275/132kV Substation. The network supports a broad range of residential, commercial and industrial customers through key substations including Townsville South, Townsville East, Garbutt, Alan Sherriff, Dan Gleeson and Ingham South. The zone also supplies major industrial facilities including Sun Metals, Glencore Copper Refinery, Yabulu industrial precinct and the Port of Townsville.

The Ross zone transmission network also supports important gas-powered generation plant, battery energy storage systems and solar farms.

Ongoing residential growth, industrial development and expansion of port and logistics activities continue to influence the long-term development of the Townsville electricity supply area and reinforce the strategic importance of the Ross zone within North Queensland.

6.6.1 Existing and committed network developments

Recent investments within the Ross zone have focused on maintaining reliable supply and supporting the continued operation of the Townsville transmission network.

Powerlink has completed several transmission and substation reinvestment projects, including replacement of primary plant at Ross and Townsville South substations, installation of a second transformer at Strathmore Substation, refurbishment and replacement of Ross transformers, reinvestment in overhead transmission infrastructure, and reinvestment in secondary systems.

Further information on committed and anticipated developments is provided in Chapter 10.

6.6.2 Emerging and evolving investment drivers

The existing transmission network within the Ross zone is expected to provide sufficient capacity to meet forecast electricity demand under the central load forecast scenario. Future investment requirements are primarily associated with maintaining the reliability of ageing transmission assets.

Much of the network was developed between the 1960s and 1970s and operates in a tropical coastal environment characterised by high humidity, marine salt exposure and elevated atmospheric corrosion. Asset condition, obsolescence and compliance risks have been identified across parts of the network supplying Townsville and surrounding communities, with ongoing reinvestment required to maintain reliable electricity supply.

6.6.3 Future network investments and opportunities

Powerlink has identified potential network developments to address emerging asset condition risks in the Ross zone within the 10-year outlook period. These opportunities are at various stages of development with some projects currently progressing through RIT-T assessments.

Table 6.3 summarises these opportunities and their indicative timing, with further detail provided in the sections that follow. The opportunities do not constitute committed projects, and their scope, timing and implementation remain subject to further assessment and investment decision-making processes.

Investment profiles for projects Powerlink anticipates will be required within five years are included in the five-year investment profile tables following Table 6.3. Other investment opportunities identified in the 10-year outlook are not profiled as their indicative need falls outside the five-year period and are at earlier stages of planning and assessment.

Table 6.3 Summary of Ross zone investments within the 10-year outlook period

ID	Potential project	High level scope	Purpose	Indicative timing	Alternatives	Indicative cost	Status
RZ-01	Line refit works on the 132kV transmission line between Ross and Dan Gleeson substations	Line refit works on steel lattice structures	Maintain supply reliability to the Ross zone	June 2031	New 132kV transmission line	$8 million (1)	Uncommitted
RZ-02	Ross 275kV reactor bushing replacement	Replacement of bushing on one of the 275kV reactors	Maintain compliance with power system performance standards	June 2033	Replacement of 275kV reactor	$4 million	Uncommitted
RZ-03	Alan Sherriff 132kV secondary systems replacement	Selected replacement of 132kV secondary systems	Maintain supply reliability to the Ross zone	June 2028	Full replacement of 132kV secondary systems	$20 million (1)	Uncommitted
RZ-04	Garbutt 132kV secondary systems replacement	Full replacement of 132kV secondary systems	Maintain supply reliability to the Ross zone	June 2029	Selected replacement of 132kV secondary systems	$11 million	Uncommitted
RZ-05	Townsville East 132kV secondary systems replacement	Staged replacement of secondary systems	Maintain supply reliability to the Ross zone	June 2028	Full replacement of secondary systems	$8 million	RZ-05 and 06 are currently being progressed as a combined RIT-T
RZ-06	Townsville South 132kV secondary systems replacement	Selected replacement of 132kV secondary systems	Maintain supply reliability to the Ross zone	June 2028	Full replacement of 132kV secondary systems	$16 million	RZ-05 and 06 are currently being progressed as a combined RIT-T
RZ-07	Yabulu South 132kV secondary systems replacement	Selected replacement of 132kV secondary systems	Maintain supply reliability to the Ross zone	June 2034	Full replacement of 132kV secondary systems	$13 million	Uncommitted
RZ-08	Clare South 132kV secondary systems replacement	Selected replacement of 132kV secondary systems	Maintain supply reliability to the Ross zone	June 2036	Full replacement of 132kV secondary systems	$14 million	Uncommitted

Note:

(1) Compared to the 2025 TAPR, the change in the indicative cost of the proposed network solution is based upon updated information in relation to the scope of work.

6.6.4 Five-year investment profiles

Powerlink anticipates several potential network investments above the RIT-T cost threshold may be required to address the risks arising from the condition of assets in the Ross zone within the next five years.

RZ-01 Addressing condition risks between Ross and Dan Gleeson

Item	Description
Location	North Queensland (running parallel to Ross River)
Asset details	The Ross to Dan Gleeson 132kV double-circuit transmission line was constructed in 1978
Investment context	The Ross to Dan Gleeson 132kV overhead transmission line operates in a tropical environment which advances corrosion of the galvanised structure components.
Investment driver	Condition driven replacement to address emerging condition, operational and safety risks associated with the overhead transmission line
Indicative timing	June 2031
Status	Uncommitted
Proposed network solution	Targeted line refit works on the 132kV transmission line between Ross and Dan Gleeson substations by June 2031 at an estimated cost of $8 million.
Other potential network solutions	Other potential network solutions include line refit works on the 132kV transmission line between Ross and Dan Gleeson substations, and development of a new 132kV transmission line between Ross and Dan Gleeson substations
Potential non-network solutions	Potential non-network solutions would need to provide supply to Townsville Ergon Energy load up to 133MW and 2,230MWh of energy each day to maintain network reliability until normal supply is restored
Inter-network impact	This network development is not anticipated to have material inter-network impacts

RZ-03 Addressing secondary systems condition risks at Alan Sherriff

Item	Description
Location	Townsville
Asset details	Established in 2002
Investment context	Alan Sherriff Substation is a major injection point into Ergon Energy's 66kV and 11kV distribution network providing supply to the Townsville area
Investment driver	Condition driven replacement to address emerging obsolescence and compliance risks on the 132kV secondary systems to maintain reliability of supply
Indicative timing	June 2028
Status	Uncommitted
Proposed network solution	Selected replacement of secondary systems at an estimated cost of $20 million by June 2028
Other potential network solutions	In-situ selected replacement of secondary systems by December 2028
Potential non-network solutions	Potential non-network solutions would need to provide supply to the 66kV and 11kV network at Alan Sherriff of up to 128MW and up to 2,128MWh per day. The nonnetwork solution would be required for an unplanned contingency event, and be able to operate on a continuous basis until normal supply is restored. Supply would also be required for planned outages.
Inter-network impact	This network development is not anticipated to have material inter-network impacts

RZ-04 Addressing secondary systems condition risks at Garbutt

Item	Description
Location	Approximately 6km west of the Townsville Central Business District
Asset details	Established in late 1950s with the last replacement in 2004
Investment context	Garbutt Substation is a major injection point into the Ergon Energy 66kV and 11kV distribution network providing supply to the Townsville area.
Investment driver	Condition driven replacement to address emerging obsolescence and compliance risks on the 132kV secondary systems to maintain reliability of supply
Indicative timing	June 2029
Status	Uncommitted
Proposed network solution	Full secondary systems replacement at an estimated cost of $11 million by June 2029
Other potential network solutions	Selected replacement of secondary systems by June 2029
Potential non-network solutions	Potential non-network solutions would need to provide supply to the 66kV network at Garbutt Substation of up to 97MW and up to 1,640MWh per day. The non-network solution would be required for an unplanned contingency event and be able to operate on a continuous basis until normal supply is restored. Supply would also be required for planned outages.
Inter-network impact	This network development is not anticipated to have material inter-network impacts

RZ-05 and RZ-06 Maintaining reliability of supply and addressing condition risks at Townsville South and Townsville East

Item	Description
Location	Townsville South and Townsville East
Asset details	Townsville South Substation was established in 1977. Townsville East Substation was established in 2008.
Investment context	Townsville South Substation provides an injection point into the Ergon Energy distribution network to supply power to southern and eastern Townsville. The substation is also a transfer point for enabling the flow of electricity between Clare to the south and Townsville to the north. Townsville East Substation was established to supply Townsville central business district and port.
Investment driver	Condition driven replacement to address emerging obsolescence and compliance risks on the 132kV secondary systems to maintain reliability of supply
Indicative timing	June 2028
Status	This project is currently undergoing RIT-T consultation. Submissions to the PSCR closed on 22 October 2026.
Proposed network solution	Selected secondary systems replacement at Townsville East Substation by June 2028 at an estimated cost of $8 million. Selected secondary systems replacement within the existing control building at Townsville South Substation by June 2028 at an estimated cost of $16 million.
Other potential network solutions	The PSCR has not identified any other credible network options
Potential non-network solutions	For Townsville South Substation, to mitigate the impact of a single 132kV feeder outage, a non-network solution would need to provide supply to major customers in the greater Townsville area of up to 70MW and up to 1,160MWh per day on a continuous basis. To maintain supply to major customers in the area and the Ergon Energy distribution network, a non-network solution would need to provide up to 150MW and up to 2,700MWh per day on a continuous basis. For Townsville East Substation, to maintain supply to the Ergon Energy distribution network, a non-network solution would need to provide up to 52MW and up to 379MWh per day on a continuous basis
Inter-network impact	This network development is not anticipated to have material inter-network impacts

6.6.5 Other potential developments

Broader developments within the greater Townsville area that may influence future transmission network requirements in the Ross zone include the proposed Lansdown Eco-Industrial Precinct, continued development of the Townsville State Development Area, expansion of Port of Townsville facilities, and residential and community growth in north-west Townsville.

6.6.6 Possible asset retirements

Powerlink has not identified any potential asset retirements in the Ross zone within the 10-year outlook period.

6.7 North zone

The North zone extends from Strathmore in the north to Nebo in the south and encompasses the transmission networks supplying Mackay, the northern Bowen Basin, major coal export infrastructure, industrial facilities, mining operations and regional communities. The zone is supplied by a combination of 275kV and 132kV transmission infrastructure.

The Mackay network is supplied primarily from Nebo 275/132kV Substation and provides supply to the Mackay region, Hay Point Coal Terminal, Dalrymple Bay Coal Terminal and surrounding communities through the wider 132kV transmission network. The Mackay to Hay Point corridor contains significant export infrastructure and associated rail networks that support mining exports from the northern Bowen Basin.

The northern Bowen Basin network comprises a meshed 132kV network supplied from Strathmore, Nebo and Lilyvale substations. The network supplies major mining operations, rail infrastructure, industrial facilities and regional communities throughout the basin.

The northern Bowen Basin is expected to remain a significant source of electricity demand growth, driven by mining developments, mine expansions and the progressive electrification of mining operations. These developments have the potential to influence future transmission network requirements across the North zone.

6.7.1 Existing and committed network developments

Recent investment across the North zone has focused on maintaining reliable supply to mining, industrial and regional customers while preserving the capability and reliability of existing transmission infrastructure.

Powerlink has completed a range of transmission line refit works, substation reinvestment projects and secondary systems replacements within the Mackay and northern Bowen Basin areas to address condition and obsolescence related risks to maintain reliability of supply.

Further information on committed and anticipated projects is provided in Chapter 10.

6.7.2 Emerging and evolving investment drivers

The North zone is characterised by a combination of asset reinvestment requirements and future load growth associated with mining, industrial and export-related developments.

Within the Mackay area, the existing transmission network is expected to provide sufficient capacity to meet forecast electricity demand over the 10-year outlook period under the central load forecast scenario. Future investment requirements are primarily associated with managing asset condition, obsolescence and compliance risks to maintain network reliability.

Within the northern Bowen Basin, the existing 132kV transmission network supplies mining operations, rail infrastructure, industrial facilities and regional communities. While network limitations are not forecast under the Central scenario load forecast, limited spare capacity may trigger the need for network investment and/or non-network solutions to support mining developments, mine expansions and mining electrification. The timing and scale of this growth remains uncertain.

Powerlink will continue to monitor these customer connection activities and other emerging developments through its annual planning process and ongoing joint planning activities with Ergon Energy.

6.7.3 Future network investments and opportunities

Powerlink has identified potential network developments to address emerging network needs and asset condition risks in the North zone within the 10-year outlook period. These opportunities are at various stages of development, with some projects currently progressing through RIT-T assessments.

Table 6.4 summarises these opportunities and their indicative timing, with further detail provided in the sections that follow. The opportunities do not constitute committed projects, and their scope, timing and implementation remain subject to further assessment and investment decision-making processes.

Investment profiles for projects Powerlink anticipates will be required within five years are included in the five-year investment profile tables following Table 6.4. Other investment opportunities identified in the 10-year outlook are not profiled as their indicative need falls outside the five-year period and are at earlier stages of planning and assessment.

Table 6.4 Summary of North zone investments within the 10-year outlook period

ID	Potential project	High level scope	Purpose	Indicative timing	Alternatives	Indicative cost	Status
NQ-01	Line refit works on the 132kV transmission line between Collinsville North, Strathmore and Clare South substations	Line refit works on the 132kV transmission line	Maintain supply reliability to the North zone	June 2035	Rebuild of the 132kV transmission line between Collinsville North, Strathmore and Clare South substations	$44 million	Uncommitted
NQ-02	Line refit works on the 132kV transmission line between Collinsville North, Goonyella Riverside and Moranbah substations	Line refit works on the 132kV transmission line	Maintain supply reliability in the Northern Region and Central West zones	June 2035	Rebuild the 132kV transmission line between Collinsville North, Goonyella Riverside and Moranbah substations	$58 million	Uncommitted
NQ-03	Line refit works on the 132kV transmission line between Moranbah, Kemmis and Nebo substations	Line refit works on the 132kV transmission line	Maintain supply reliability in the Northern Region and Central West zones	June 2035	Rebuild the 132kV transmission line between Moranbah, Kemmis and Nebo substations	$40 million	Uncommitted
NQ-04	Northern Bowen Basin reinforcement (1)	The scope of work ranges from installation of power flow control devices through to rebuild of the existing Nebo to Moranbah 132kV double-circuit line	Maintain reliability of supply within the northern Bowen Basin	The timing and scope of network investments is dependent on scale, pace and timing of load developments	The optimal network investment will depend on potential load developments within the northern Bowen Basin, and available non-network solutions. The optimal investment pathway will also take into account condition drivers (refer NQ-03)	Dependent on optimal network and non-network solution	Proposed contingent project in Powerlink's 2027–32 Revenue Proposal
NQ-05	Broadsound 275kV selected primary plant replacement	Selected replacement of 275kV primary plant	Maintain CQNQ power transfer capability and supply reliability to the Northern Region and Central West zone	June 2030	Full replacement of 275kV primary plant	$19 million	Uncommitted

Table 6.4 Summary of North zone investments within the 10-year outlook period (*continued*)

ID	Potential project	High level scope	Purpose	Indicative timing	Alternatives	Indicative cost	Status
NQ-06	Stanwell selected 275kV primary plant replacement	Selected replacement of 275kV primary plant	Address emerging condition related risks to maintain reliability of supply	December 2032	Rebuild of Stanwell 275kV substation	$22 million	Uncommitted
NQ-07	Pioneer Valley 132kV primary plant replacement	Selected replacement of 132kV primary plant	Maintain supply reliability to the North zone	June 2035	Full replacement of 132kV primary plant	$8 million (2)	Uncommitted
NQ-08	Alligator Creek 132kV Substation reinvestment	Selected replacement of 132kV primary plant and SVC secondary systems replacement	Maintain supply reliability to the North zone	December 2030	Full replacement of 132kV primary plant and SVC secondary systems replacement	$33 million	Uncommitted
NQ-09	North Goonyella 132kV secondary systems replacement	Selected replacement of 132kV secondary systems in the existing building	Maintain supply reliability to the North zone	June 2029	Full replacement of 132kV secondary systems in a new building	$9 million	Uncommitted
NQ-10	Strathmore 275kV and 132kV secondary systems replacement	Selected replacement of 275kV and 132kV secondary systems in a new prefabricated building	Maintain supply reliability to the North zone	June 2034	Selected replacement of 275kV and 132kV secondary systems in existing panels	$14 million	Uncommitted
NQ-11	Strathmore SVC secondary systems replacement	Selected replacement of 132kV secondary systems in existing building including thyristor valves and cooling system	Maintain CQ-NQ power transfer capability and compliance with system standards	December 2030	Full replacement of 132kV secondary systems in a new building	$24 million	Currently progressing through RIT-T assessment
NQ-12	Lilyvale 132kV secondary systems replacement	Selected replacement of 132kV secondary systems	Maintain supply reliability to the Northern Region and Central West zone	June 2036	Full replacement of 132kV secondary systems	$5 million	Uncommitted

Notes:

(1) The final status of this project will be determined as part of the AER's Final Determination on Powerlink's 2027-32 Revenue Proposal to be published in April 2027.

(2) Compared to the 2025 TAPR, the change in the estimated cost of the proposed network solution is based upon updated information in relation to the condition and scope of works.

6.7.4 Five-year investment profiles

Powerlink anticipates several potential network investments above the RIT-T cost threshold may be required to address the risks arising from the condition of assets in the North zone within the next five years.

NQ-05 Maintaining reliability of supply at Broadsound

Item	Description
Location	Livingstone near Marlborough
Asset details	Established in 1983. Further extensions have been made with additions of 275kV feeders to the west, south and north.
Investment context	Broadsound Substation is a major transmission node connecting power flows between northern and Central Queensland. It also connects Lilyvale Substation and the Central West loads.
Investment driver	Condition driven replacement to address emerging condition risks on the 275kV primary plant to maintain reliability of supply
Indicative timing	June 2030
Status	Uncommitted
Proposed network solution	Selected 275kV primary plant replacement at Broadsound Substation by June 2030 at an estimated cost of $19 million
Other potential network solutions	Full 275kV primary plant replacement by June 2030
Potential non-network solutions	Potential non-network solutions would need, as a minimum, to provide supply to Lilyvale and Blackwater loads of approximately 220MW and 4,050MWh per day.
Inter-network Impact	This network development is not anticipated to have material inter-network impacts

NQ-08 Addressing the primary plant and secondary systems condition risks at Alligator Creek

Item	Description
Location	Approximately 30km south-east of Mackay
Asset details	Established in 1982
Investment context	Alligator Creek Substation supplies the Hay Point and Dalrymple Bay coal terminals, associated rail infrastructure and the Ergon Energy distribution network serving communities south of Mackay
Investment driver	Condition driven replacement to address emerging condition and obsolescence risks on the 132kV primary plant and SVC secondary systems.
Indicative timing	December 2030
Status	Uncommitted
Proposed network solution	Selected 132kV primary plant replacement, and 132kV and SVC secondary systems replacement by December 2030 at an estimated cost of $33 million
Other potential network solutions	Staged selected 132kV primary plant replacement, and 132kV and SVC secondary systems replacement by December 2030
Potential non-network solutions	Potential non-network solutions would need to provide supply to the 132kV loads connected at Alligator Creek Substation of up to 70MW and up to 1,500MWh per day
Inter-network Impact	This network development is not anticipated to have material inter-network impacts

NQ-09 Addressing the secondary systems condition risks at North Goonyella

Item	Description
Location	Approximately 40km north of Moranbah
Asset details	Established in 1992
Investment context	North Goonyella Substation provides supply to the adjacent coal mine. The existing secondary systems were installed more than 20 years ago and are now obsolete.
Investment driver	Condition driven replacement to address emerging obsolescence and compliance risks on the 132kV secondary systems
Indicative timing	June 2029
Status	Uncommitted
Proposed network solution	Selected replacement of 132kV secondary systems in existing building by June 2029 at an estimated cost of $9 million
Other potential network solutions	Full replacement of 132kV secondary systems in a new building
Potential non-network solutions	Potential non-network solutions would need, as a minimum, to provide supply to the Goonyella loads of approximately 22MW and 516MWh per day
Inter-network Impact	This network development is not anticipated to have material inter-network impacts

NQ-11 Managing voltage levels and transfer capability in North Queensland

Item	Description
Location	Approximately 5km from Collinsville
Asset details	Installed in 2007
Investment context	Strathmore 275/132kV Substation is a major injection point to supply Ergon Energy's distribution network and Powerlink's direct connected customers in the northern Bowen Basin
Investment driver	Condition driven replacement to address emerging condition risks on the SVC secondary systems, thyristor valves and cooling system
Indicative timing	December 2030
Status	Current RIT-T. Submissions to the PSCR closed on 22 October 2026
Proposed network solution	Replacement of the Strathmore SVC secondary systems, thyristor valves and cooling system by December 2030 at an estimated cost of $24 million
Other potential network options	Install a new 275kV reactor at Strathmore Substation by December 2030, decommission Strathmore SVC by December 2031 and install a new 275kV capacitor bank at Strathmore Substation by 2032
Potential non-network solutions	A non-network solution would need to be capable of delivering a minimum of 50MVAr and up to 100MVAr of capacitive voltage support, and a minimum of 80MVAr of inductive voltage support on a continuous basis
Inter-network impact	This network development is not anticipated to have material inter-network impacts

6.7.5 Other potential developments

The Mackay region is expected to experience continued residential, commercial and industrial growth which may drive the need for future network investment. Longer-term load demand may also be influenced by expansion of industrial and export-related infrastructure within the Mackay to Hay Point corridor, including the Port of Mackay, Hay Point Coal Terminal and Dalrymple Bay Coal Terminal, the timing and scale of which remain uncertain.

Powerlink will continue to monitor these developments through its annual planning process and ongoing joint planning activities with Ergon Energy.

6.7.6 Potential asset retirements

Powerlink has not identified any potential asset retirements in the North zone within the 10-year outlook period.

6.8 Northern Region transmission line refit program

Where smaller transmission line refit requirements have been identified within the Northern Region, these may be grouped into regional programs as part of Powerlink's Geographic Line Refit Program. This approach is intended to improve delivery efficiency and reduce costs by coordinating geographically proximate transmission line refit requirements that might otherwise be addressed separately. Transmission lines currently identified for potential inclusion in the Northern Region line refit program are summarised in Table 6.5.

Table 6.5 Transmission lines under consideration for inclusion in Northern Region line refit program in the 10-year outlook period

Transmission line	Zone	Potential line refit program
Line refit works on the 275kV transmission line between Woree and White Rock	Far North	Cairns
Line refit works on the 275kV transmission line between Bayview Heights and Davies Creek	Far North	Cairns
Line refit works on the 132kV transmission line between Chalumbin and Turkinje	Far North	Cairns
Line refit works on the 132kV transmission line between Woree and Edmonton substations	Far North	Cairns
Line refit works on the 275kV transmission line between Strathmore and Ross substations	Ross	Townsville/Mackay
Line refit works on the 132kV transmission line between Townsville South and Clare South tee Invicta	Ross	Townsville/Mackay
Line refit works on the 132kV transmission line between Townsville South and Ross substations	Ross	Townsville/Mackay
Line refit works on the 132kV transmission line between Pioneer Valley and Eton Tee	North	Townsville/Mackay
Line refit works on the 132kV transmission line between Nebo and Pioneer Valley substations	North	Townsville/Mackay
Line refit works on the 132kV transmission line between Mackay and Pioneer Valley substations	North	Townsville/Mackay

6.9 Northern Region lines approaching end of technical service life

The following table provides a consolidated outlook of transmission lines in the Northern Region expected to approach end of technical service life within the 10-year outlook period and may require future intervention, reinvestment or other lifecycle management actions.

Assets identified within the 10-year outlook are subject to active planning, investment assessment or lifecycle management activities, with potential responses including life extension, refurbishment, replacement, operational management strategies or retirement.

Transmission lines expected to approach end of technical service life between 10 and 20 years are provided in Appendix F.

Table 6.6 Northern Region transmission lines approaching end of technical service: 10-year outlook

Zone	Feeder	Voltage	General location
Far North	857, 858	275kV	Between Guybal Munjan and Chalumbin substations
Far North	877	275kV	Between Tumoulin and Woree substations
Far North	8902	275kV	Between Woree and Walkamin substations
Far North	7141, 7142	132kV	Between Kamerunga and Woree substations
Far North	7165, 7166	132kV	Between Chalumbin and Turkinje substations
Far North	7191, 7192	132kV	Between Kareeya and Chalumbin substations
Far North	7284	132kV	Between Woree and Edmonton substations
Ross	8916, 8917	275kV	Between Ross and Guybal Munjan substations
Ross	7128/2	132kV	Between Strathmore and Clare South Tee King Creek substations
Ross	7144/1, 7144/2, 7151/1, 7151/2	132kV	Between Ross and Alan Sherriff Tee Dan Gleeson substations
Ross	7156	132kV	Between Ross and Townsville South substations
Ross	7208	132kV	Between Strathmore and Clare South substations
North	820	275kV	Between Bouldercombe and Broadsound substations
North	821	275kV	Between Bouldercombe and Nebo substations
North	7119	132kV	Between Nebo and Alligator Creek substations
North	7120, 7304	132kV	Between Nebo and Pioneer Valley substations
North	7127	132kV	Between Collinsville North and Strathmore substations
North	7152	132kV	Between Alligator Creek and Pioneer Valley substations
North	7238	132kV	Between Pioneer Valley and Mackay substations
North	7369, 7370	132kV	Between Moranbah and Goonyella Riverside substations
North	7451	132kV	Between Pioneer Valley and Mackay substations