15 January 2026

CQ-NQ Area Plan

DISCLAIMER:

This document provides indicative future investment planning information based on current assumptions and scenarios.

It does not represent a commitment to specific investments and is subject to change in response to market developments, external environment, and regulatory requirements.

Version Control

Version	Date	Sections	Comment
1.0	07/11/2025	All	Initial draft for comment
2.0	15/01/2026	All	Issued for approval

Approvals

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Area Overview

The Central Queensland to North Queensland (CQ-NQ) 275kV transmission corridor is a critical backbone of the Queensland power system linking major generation sources, firming plant and load centres between Central, North and Far North Queensland.

This transmission corridor extends from substations at Stanwell and Bouldercombe through Broadsound, Nebo, Strathmore and Haughton River, Ross and further north to Chalumbin. The corridor is also supported by the 132kV sub-transmission network that supplies key regional, coastal and agricultural townships as well as inland mining and mineral processing areas.

The strategic importance of the corridor is increasing as the energy system transitions towards decarbonisation. Operating conditions are shifting due to growth in North Queensland solar generation and higher daytime southward transfers. These changes, combined with anticipated electrification of Northern Bowen Basin mining operations, emerging industrial loads at Lansdown and Townsville, integration of CopperString, and retirement of synchronous units in Central Queensland will drive more dynamic and often reversed power flows. Transfers that were traditionally northward are increasingly southward during the day.

The Queensland Investment Corporation (QIC) will deliver the Eastern Link of CopperString, with major construction commencing by 2028 and commercial operations by 2032 (subject to approvals). This allows high quality large scale wind resources in the Hughenden area to be connected to the National Electricity Market (NEM). The Hughenden wind resource has a diurnal pattern that offers diversity against other wind resources in the NEM. The increasing resource diversity is valuable in maximising efficiency and drives an overall lower cost in generation expansion.

The connection of wind generation to the CopperString network, together with additional investment in new generation within NQ is expected to increase the power transfers in a southerly direction to central Queensland, narrowing operational headroom on the Bouldercombe to Broadsound to Nebo 275kV transmission sections.

Infrastructure age is a compounding challenge across this significant and lengthy transmission corridor. Much of the southern section of the corridor, Bouldercombe to Broadsound to Nebo, consists of single-circuit lines commissioned in the late 1970s and early 1980s that will require targeted reinvestment over the short to medium term. The condition of the existing 275kV network together with its relatively limited capacity presents an opportunity to reassess the future capability and role of these network assets in the context of significant system change and development.

Market modelling and economic assessment from the Energy Roadmap (2025) has identified a suite of preferred investments that deliver the lowest total system cost and lowest regret across multiple scenarios. Key elements include rebuilding the Bouldercombe to Broadsound to Nebo section as high-capacity double-circuit 275kV lines, stringing the second Stanwell to Broadsound circuit, and cutting in the Strathmore to Ross circuit to Reid River. These works increase the thermal and stability performance, and in doing so improve new generation and storage hosting capacity and support the CopperString integration.

Delivering this long-term strategy requires careful sequencing to maintain reliability during multi-year rebuilds. Existing transmission lines cannot be rebuilt insitu without significant impacts on CQ-NQ transfer capability and reliability of supply. New or widened easements are essential requiring early consultation and corridor selection to inform credible and prudent options, and to accommodate five to eight-year lead times for necessary approvals, easement acquisition, procurement, and detailed design.

Given the corridor’s central role in maintaining reliability of supply to northern Queensland, connecting new generation and storage, and enabling future industrial development and delivering market efficiencies, prudent and efficient network investment is vital to the long term security and cost effective operation of the Queensland power system.

Existing System

The CQ-NQ 275kV transmission corridor comprises a mix of legacy single circuit lines constructed in the late 1970s and 1980s and modern double circuit assets established from the late 2000s.

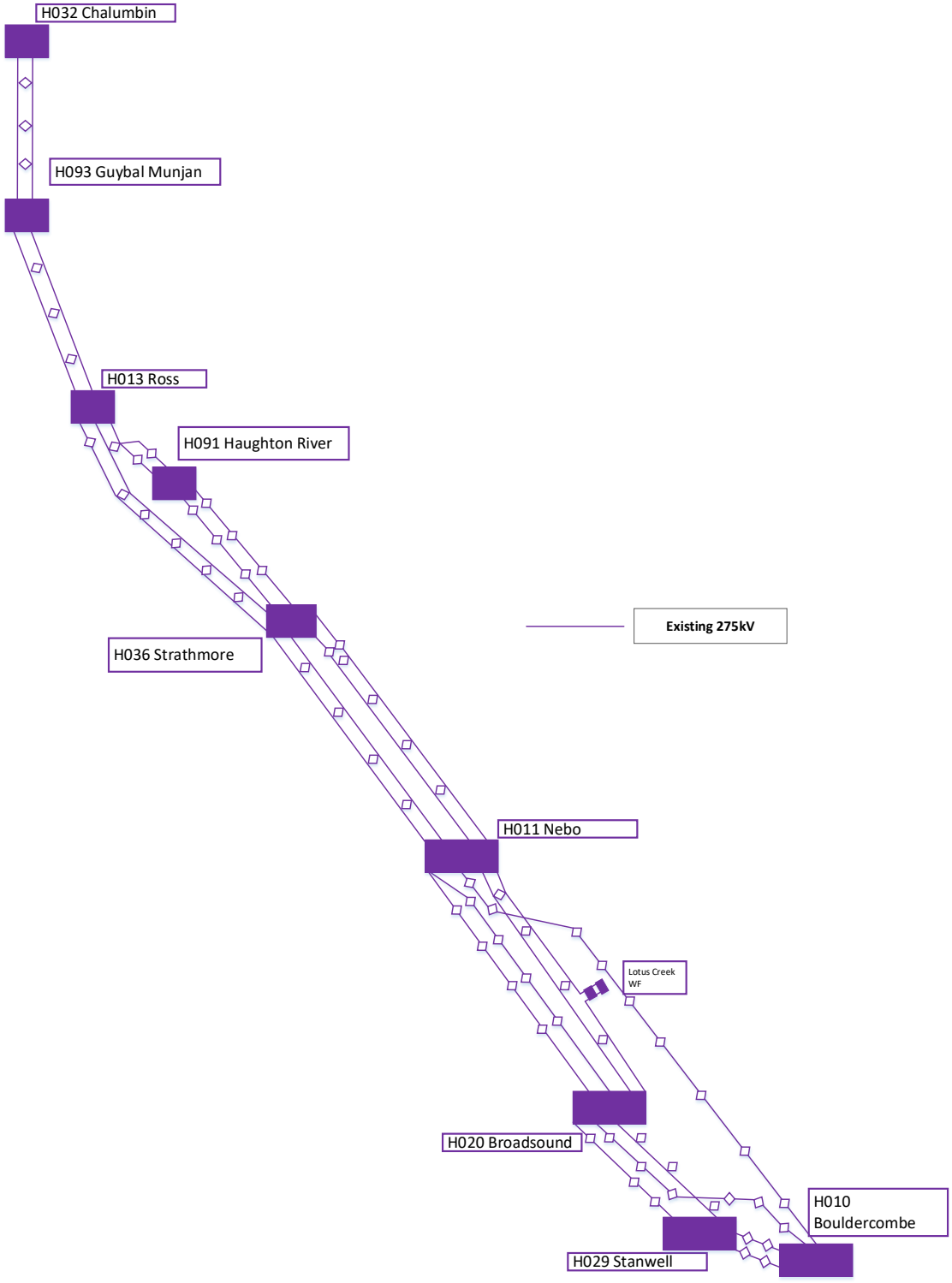
The southern portion, Bouldercombe to Broadsound to Nebo, contains several low capacity single circuit assets approaching end of technical life over the short to medium term. North of Nebo, the network transitions to higher capacity double circuit construction extending to Strathmore, Haughton River and Ross.

Historical Transmission Line Development

Section	Transmission Line
1977–1980	Feeder 820 (Bouldercombe to Broadsound) constructed as 275kV single circuit, 143km in length, and is low capacity (550MVA) Feeder 821 (Bouldercombe to Nebo) constructed as 275kV single circuits, 292km in length, and is low capacity (645MVA)
1977 and 1995	Feeder 834 (Broadsound to Nebo) constructed as two 275kV single circuits that are paralleled, 151km in length, and is low capacity (660MVA)
1978–1985	Feeders 822 and 870 (Nebo to Strathmore) constructed as 275kV double circuit, 148km in length, and are rated at 1250MVA. Feeders 879 and 8911 (Strathmore to Haughton to Ross) constructed as 275kV double circuit, 167km in length, and are rated at 1070MVA
1989	Feeders 857 and 858 (Chalumbin to Ross) constructed as 275kV double circuit, 244km in length, and are relatively low capacity at 620MVA
1992	Feeder 856 (Stanwell to Broadsound) constructed as 275kV double-circuit line, 127km in length, and rated at 1250MVA
2002	Feeder 8831 (Stanwell to Broadsound) constructed as 275kV double-circuit line, one side initially strung, 127km in length, and rated at 1520MVA
2008–2009	Feeders 8846 and 8847 (Broadsound to Nebo) constructed as 275kV double-circuit line, 148km in length, and rated at 1500MVA each Feeders 878 and 8856 (Nebo to Strathmore) constructed as 275kV double circuit line, 162km in length, and rated at 1500MVA each
2009–2011	Feeders 8857/8858 (Strathmore to Ross) constructed as 275kV double-circuit lines, 182km in length, and rated at 1070MVA each

The existing transmission network is shown below. The southern single circuit sections now represent the weakest part of the CQ-NQ backbone in terms of thermal and voltage transfer capacity limitations as well as system strength.

Figure 1 – Bouldercombe to Ross Existing 275kV Network



Investment Drivers

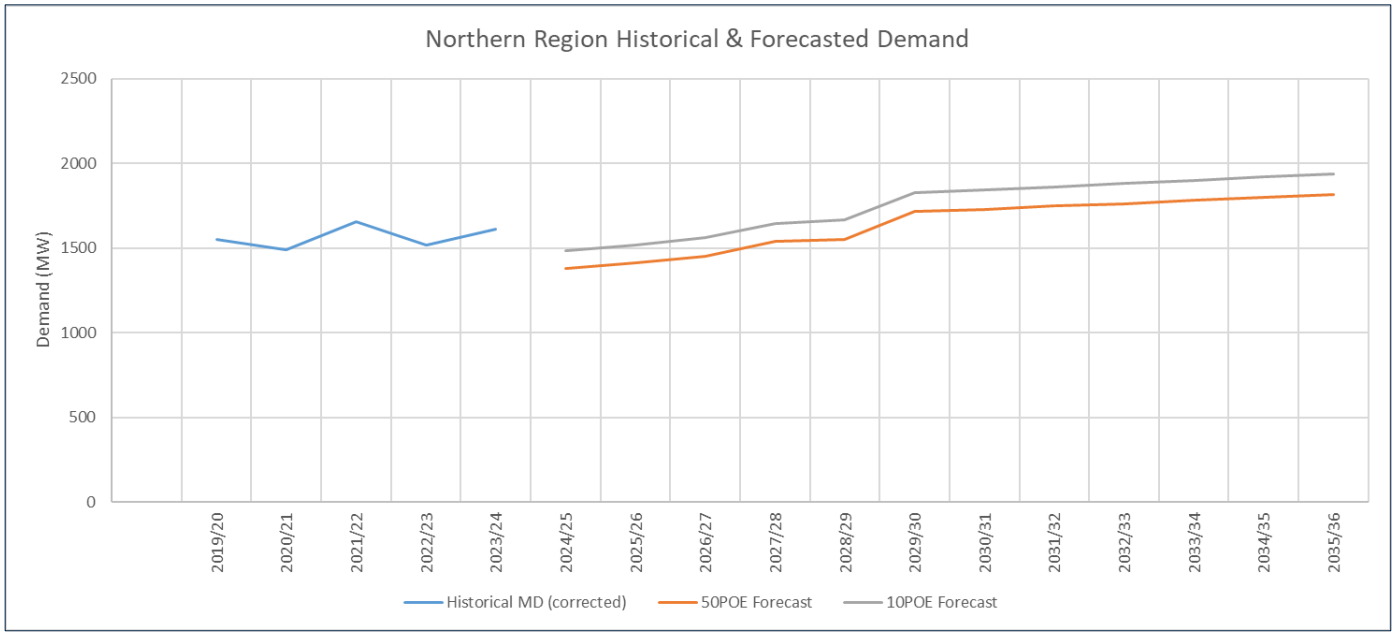
Investment needs arise from the convergence of existing and future load requirements, condition-based risks, transfer capability constraints, new generation and storage development, power system security requirements, and the broader energy transformation.

North Queensland Area Load Forecast

The Northern region includes substations between the Bouldercombe and Far North Queensland. The combined load must be met by North Queensland generation and the power transfer capacity of the CQNQ 275kV grid section.

Figure 2 shows that the maximum demand for these loads is expected to gradually increase over the forecast period. These demand forecasts are aligned with those published within the Powerlink 2025 Transmission Annual Planning Report (TAPR).

Figure 2 – Northern Queensland Demand Forecast



Line Condition Drivers

The double-circuit transmission line between Ross and Chalumbin (F857/858), commissioned in 1989, have emerging condition related risks. Targeted reinvestment will be required within five years to manage these risks. The proposed approach is to undertake a comprehensive suite of line refit work on existing overhead structures to extend the technical and operational life of the asset.

The single-circuit transmission lines connecting Bouldercombe, Broadsound and Nebo, constructed between the late 1970s and mid-1980s, are approaching end of technical life and have emerging condition related risks. Targeted reinvestment will be required over the short to medium term to address these emerging risks. The assets identified for reinvestment or retirement include:

- F820 Bouldercombe to Broadsound
- F821 Bouldercombe to Nebo
- F834 Broadsound to Nebo.

The single-circuit Stanwell to Broadsound transmission line (F856), commissioned in the late 1990s, is also projected to have emerging condition-related risks consistent with ageing of structures and

components. Targeted reinvestment is anticipated within the medium term to maintain ongoing network reliability.

Existing Network Transfer Capability

The maximum power transfer from Central Queensland to the Ross zone is set by thermal, voltage and transient stability limits following contingencies on the 275kV network. At present, this northerly transfer capability is initially constrained by an outage between Stanwell and Broadsound substations. Power transfers may also be constrained by voltage stability limitations associated with the contingency of the Townsville gas turbine.

The maximum power transfer south from North Queensland to Central Queensland, while not currently binding, is also limited by thermal, voltage and transient instability following contingencies on the 275kV network. The first limiting contingency for southerly flow is the trip of the Stanwell to Broadsound 275kV line. Although recently connected wind and solar generation in North and Far North Queensland has reduced average northerly energy transfers, the peak power transfer into NQ remains broadly consistent with earlier years. At the same time, new variable generation is resulting in more frequent and increasingly large southerly flows (i.e. from NQ to CQ). Peak southward transfers have grown in recent years and are expected to continue increasing as committed generation enters operation.

Across both directions of flow, CQ-NQ transfer capability is shaped by several underlying drivers:

- **Thermal and stability constraints:** Thermal and voltage stability limits across the Stanwell to Broadsound corridor remain the dominant restriction for south-north transfers. For north-south transfers transient stability can be most limiting.
- **Changing flow patterns:** Increasing daytime southward transfers from North Queensland solar generation continue to narrow operational headroom on the Bouldercombe to Broadsound and Nebo section, while new variable generation contribute to more variable, bidirectional transfer conditions. Southerly power transfers are forecast to increase and be constrained by the existing network capacity with investment in new generation in NQ and commitment of CopperString network.
- **Load growth:** Anticipated load developments including Northern Bowen Basin electrification (up to ~600 MW), the Lansdown Eco-Industrial Precinct (up to ~900 MW), and industrial expansion around Mackay and Townsville are likely to further increase northward power requirements beyond the capability of the existing network dependent on the relative timing of new load development and new generation developments in North Queensland.
- **Generation and storage developments:** New and committed wind, solar and battery storage projects in North and Far North Queensland are shifting the regional supply demand balance, increasing periods of southerly flow toward Central Queensland, and increasing the frequency and magnitude of high southward transfers. The cumulative effect amplifies the need for transfer capability headroom and can accelerate the onset of network congestion under both contingency and normal operating conditions.

Taken together, these factors indicate that thermal, voltage and transient stability constraints may lead to significant congestion across the CQ-NQ transmission network. Without targeted reinforcements or operational measures, both northerly and southerly transfer capability could be materially constrained, increasing curtailment risk and limiting the network's ability to support emerging load, generation and storage developments across the region.

Generation and Storage Developments

Powerlink continues to receive strong interest from generation and energy storage proponents seeking to connect to the CQ-NQ 275kV network. Over 9 GW[1] of proposed generation is progressing through the

[1] This excludes generation that may connect to the CopperString network within the Hughenden area.

NER Chapter 5 process north of Bouldercombe and Stanwell. As new generation and storage connects, the existing low-capacity assets are increasingly becoming a limiting factor in how much power can be transported through the corridor without incurring network constraints.

Under a plausible development scenario, future power injections enabled by CopperString, including significant levels of anticipated wind generation in the Flinders region, are expected to further increase southward flows toward Central Queensland. At the same time, retirement of major synchronous generation in Central Queensland, coupled with forecast load growth, is expected to increase reliance on transfers from North Queensland to maintain reliability of supply in the Gladstone zone.

Broader reductions in synchronous capacity across Central Queensland further increases the amount of energy required from North Queensland and reinforces the need for additional transfer capability across the CQ-NQ network. The existing network does not have the capacity to host these levels of new generation in North Queensland.

The condition of the current assets present both emerging reinvestment drivers and opportunity to increase network capacity to maintain reliability or supply and deliver market efficiencies. In lieu of reinvesting in the aging low capacity assets, an alternative strategy is to rebuild these lines at higher capacity.

Least cost expansion plan market modelling has shown that increasing the transfer capacity between north and central Queensland to facilitate the hosting of new North Queensland generation resources is a key component of the least cost expansion plan, the benefits of which are greater than the cost of advancing these rebuilds. The higher capacity network unlocks the efficient expansion of new generation in North Queensland.

The timing for these transmission augmentations is timed to be coordinated with the commissioning of the eastern section of the CopperString Project and the connection of new generation, including high quality large scale wind resources in the Hughenden area, as this influences transfer patterns on the existing 275kV transmission network.

Load Growth Scenarios

In addition to forecasted loads in Figure 2, plausible load development scenarios in North Queensland have the potential to materially increase demand in north Queensland. Electrification of mining operations in the Northern Bowen Basin (up to ~600 MW), combined with the emergence of large new industrial facilities at the Lansdown Eco-Industrial Precinct (LEIP, up to ~900 MW), represent significant new sources of demand.

Under plausible load growth scenarios, and where little or no additional generation is committed in NQ, the cumulative effect of these developments increases required power flows into North Queensland to levels that exceed the existing network's capability. As demand rises north of Bouldercombe, the CQ-NQ grid section would experience increasing congestion. Under such conditions, maintaining power transfers within secure limits may require greater dispatch of higher cost generation in North Queensland.

CopperString Project

The CopperString project involves building approximately 840km of new electricity transmission lines to connect Mount Isa to the National Electricity Market (NEM). It will also allow access to good quality wind generation resources in the Flinders region around Hughenden.

The Energy Roadmap confirms that the Queensland Investment Corporation (QIC) will deliver the Eastern Link (Townsville to Hughenden) of CopperString with major construction commencing by 2028 and commercial operations by 2032 (subject to approvals). QIC is also beginning work to deliver the Western Link (Hughenden to Mount Isa).

The Eastern Link will be constructed at 330kV and is expected to connect to a new Powerlink switching station at Reid River, by cutting into the existing 275kV network between Strathmore and Ross substations. The Energy Roadmap notes that the Eastern Link will enable the connection of new

generation in the Flinders region. The hosting capacity for new generation within this region, together with further generation development in northern Queensland, has the potential to significantly increase power transfers from northern to central Queensland.

Least cost expansion planning has shown that there are net market benefits in expanding the power transfer capability of the NQ to CQ network to unlock the valuable wind resources in NQ. This market modelling was conducted as part of the analysis completed for the Energy Roadmap.

Under assumptions applied in the Energy Roadmap, electrification of load within the NQ area was also modelled. This reached levels of 400 MW by the late 2030s and over 700 MW by the end of the period. This is evidence that the market benefits from augmenting the NQ to CQ transmission capacity remain robust even under scenarios with higher load levels within the north Queensland area.

Investment Strategy

Powerlink's medium to long term investment strategy for the CQ-NQ transmission corridor is centred on a staged transition from ageing transmission lines, including low capacity single circuit assets, toward a higher capacity 275kV double circuit network. This approach responds to both the emerging condition issues of assets and the need for power system capability between Central and North Queensland to support the efficient market development.

The strategy aligns with modelling in the Energy Roadmap[2] and the identified Optimal Development Pathway (ODP), which demonstrates that augmenting transfer capability between Ross and Central Queensland had the lowest total system cost and the benefits of expanding low cost generation in NQ with reduced network congestion, exceeds the net cost of the proposed target reinforcement.

The staged rebuild framework is designed to:

- Lift thermal, voltage and stability limits that currently constrain north-south and south-north power transfers.
- Enable increased hosting capacity for new generation and storage sources connecting in North and Far North Queensland.
- Align with least cost Optimal Development Pathway (ODP) outcomes as demonstrated by comparative market modelling of candidate transmission pathways.
- Complement the CopperString Eastern Link ensuring the North Queensland network has the system strength and headroom required to efficiently transport new low cost generation from the Flinders region.
- Leverage reinvestment timing and replacing end of life single circuit lines with strategically higher capacity alternatives rather than extending the life of low capacity network assets.

Multiple sequencing and delivery pathways remain feasible with prudent and efficient investment timing depending on:

- Asset condition and emerging risk profiles.
- Timing and scale of new industrial and/or generation development.
- Market benefit outcomes (including RIT-T aligned considerations).
- The readiness and availability of future easements.
- The pace and extent of reductions in synchronous generation capacity in Central Queensland.

This Area Plan identifies potential reinvestment and augmentation pathways but does not pre-determine outcomes of the RIT-T process. All credible options will be considered in accordance with the Rules closer to required investment decision making and timing.

[2] See: https://www.treasury.qld.gov.au/files/Queensland-Energy-Roadmap-2025-25-043.pdf.

Investment Pathways

Two investment pathways have been assessed for the Bouldercombe to Ross 275kV transmission network. Each pathway consists of several staged actions across a 20 year period.

A high-level summary of investment pathways is provided below.

Investment Pathway A – Bouldercombe to Ross Life-Extension Followed by 275kV Rebuild and Reconfiguration

This investment pathway comprises of series of life extension works to maintain the existing topography and existing capability of the transmission network followed by future build and reconfiguration.

Stage 1

Life extension works on the Bouldercombe to Broadsound Feeder 820, Bouldercombe to Nebo Feeder 821, and Broadsound to Nebo Feeder 834 comprising of one or two targeted line refit work to existing overhead structures to extend the technical and operational life of the asset each providing ten years of additional serviceable life.

Cut-in the third circuit between Strathmore and Ross (feeder 8911) to the Reid River Substation.

Stage 2

Life extension works on the Nebo to Strathmore Feeder 822 and Strathmore to Haughton River to Ross Feeder 879 comprising of one or two targeted line refit work to existing overhead structures to extend the technical and operational life of the asset each providing ten years of additional serviceable life.

Stage 3

String second side Stanwell to Broadsound Feeder 8831.

Rebuild of the Bouldercombe to Broadsound Feeder 820.

Rebuild of the Broadsound to Nebo Feeder 834.

Stage 4

Rebuild of the Nebo to Strathmore Feeder 822 and Strathmore to Haughton River to Ross Feeder 879.

Overview and Rationale

Under this investment pathway, the existing transmission topology between Bouldercombe and Ross is retained for an extended period, with targeted life extension works used to manage condition risks on ageing assets before reconfiguration and rebuild in later stages consistent with Investment Pathway B.

However, adopting this pathway also prolongs reliance on ageing, low capacity infrastructure that increasingly limits secure transfer capability under a range of operating conditions. Because the life extension strategy requires multiple refit cycles prior to eventual rebuild, it results in recurring outage programs and extended operational complexity.

In addition, this investment pathway does not signal to the market that the capacity between NQ and CQ will be augmented. This is an impediment to the commitment of additional generation beyond the existing network capacity. Congestion and low marginal loss factors will be a significant deterrent to the bankability of future projects.

This investment pathway does not unlock the valuable wind resources in NQ. Market modelling has shown that this is not the least cost expansion pathway for the NEM.

Investment Pathway B – Bouldercombe to Ross Upfront 275kV Rebuild and Reconfiguration

This investment pathway comprises reconfiguration between Bouldercombe and Broadsound, and upfront construction of new 275kV double circuit transmission line in lieu of life extension works.

Stage 1

String second side Stanwell to Broadsound Feeder 8831.

Rebuild of the Bouldercombe to Broadsound Feeder 820.

Cut-in the third circuit between Strathmore and Ross Feeder 8911 to the Reid River Substation.

Stage 2

Rebuild of the Broadsound to Nebo Feeder 834.

Stage 3

Rebuild of the Nebo to Strathmore Feeder 822.

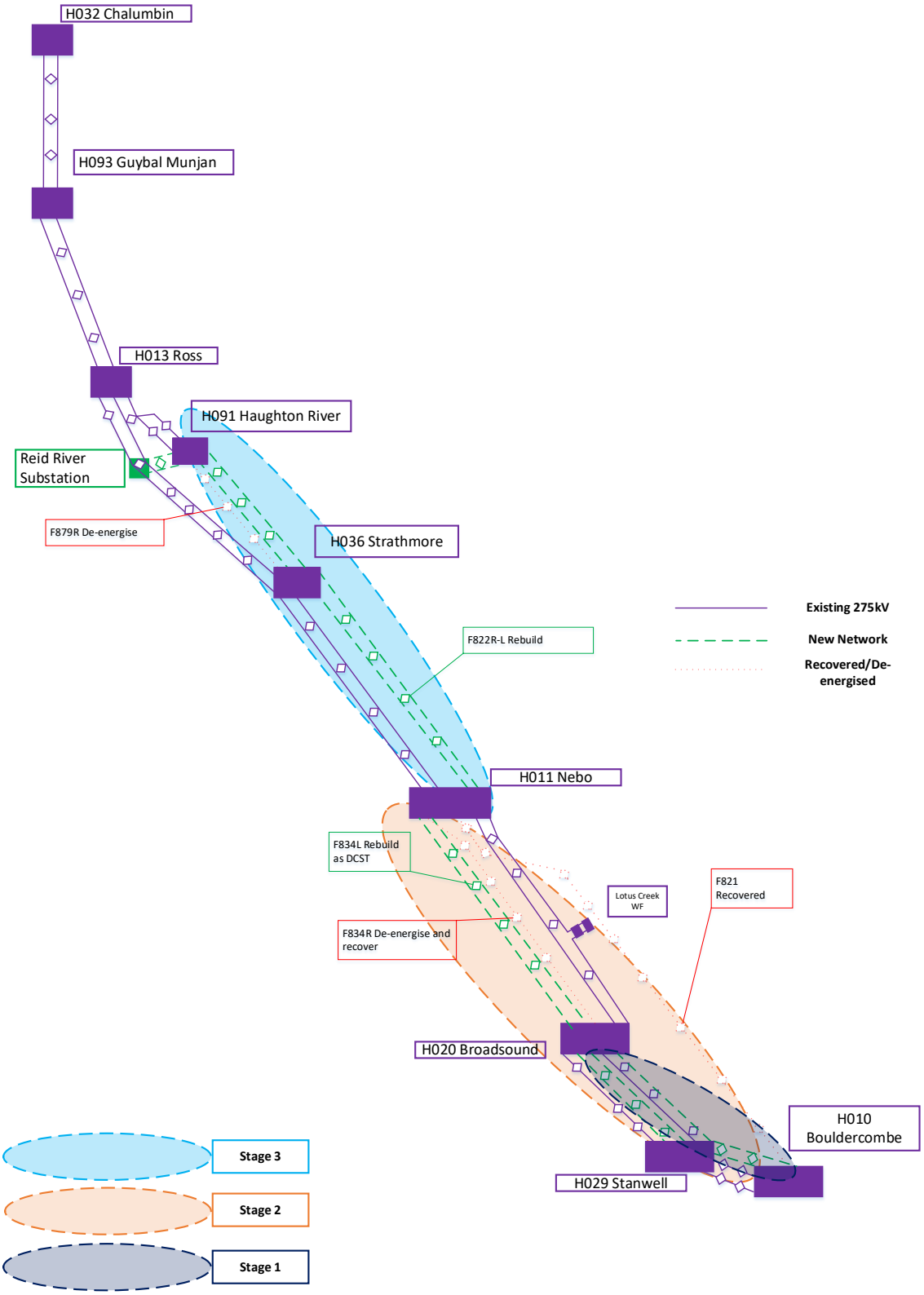
Rebuild of the Strathmore to Haughton River Feeder to Ross 879.

Overview and Rationale

This investment pathway involves delivering major reinvestment works upfront through rebuild and reconfiguration of key sections of the CQ-NQ 275kV corridor. Proceeding with the rebuild upfront provides an earlier increase in transmission headroom.

This pathway aligns closely with the findings of long term market modelling and the identified Optimal Development Pathway (ODP) within the Energy Roadmap, including requirements associated with CopperString and the integration of new low cost generation.

Figure 3 – Investment Pathway B Staging



Note: The new network line routes displayed are illustrative only and will be subject to corridor selection processes, community engagement, credible option analysis, and relevant approvals. Timing of stages are subject to CPA conditions being met and AER Approval via a Contingent Project Application (CPA).

Assessment of Other Alternatives

A range of alternate investment strategies were examined as part of the Central Queensland to North Queensland area plan. A number of these were discounted due to very high capital cost while others were assessed as complementary but not sufficient to address the identified need.

(C) Construction of New Central to North Queensland 500kV Transmission Line

As part of the options assessment, Powerlink also considered the potential development of a 500kV backbone extending from Central Queensland to CopperString. While such an option was examined in earlier long term planning studies, updated market modelling undertaken for the Energy Roadmap[3] and subsequent analysis has shown that this higher capacity backbone is not part of the ODP under the current demand outlook, cost assumptions, or expected generation development trajectory.

The reduction in forecast hydrogen related load growth combined with higher transmission construction costs means that a 500kV solution is no longer part of the least cost expansion pathway. A higher capacity transmission backbone may be optimal under circumstances where the load forecast increases significantly, the cost of transmission decreases, substantial deviations in market led generation or storage from modelled outcomes leading to network congestion, or a combination of these factors.

For these reasons, the establishment of new 500kV transmission backbone between central and north Queensland is not recommended based on information to date.

(D) Rebuild 275kV Insitu on Existing Easement Alignment

Rebuilding existing assets on their current alignments were assessed. These works would require prolonged outages to remove the existing single circuit lines and rebuild new overhead lines along the existing alignment.

Extended outages would expose significant North Queensland load at risk, materially increase the likelihood of generator curtailment, and compromise N-1 security for extended periods. Given the criticality of the CQ-NQ corridor and the inability to maintain adequate transfer capability during insitu reconstruction, this option was not considered viable due to material risks to reliability and security.

(E) Reconductoring and/or Uprating of Existing 275kV Transmission Lines

High temperature reconductoring were considered as lower rated options to increase power transfer capacity across the CQ-NQ corridor.

Due to the age profile of the existing transmission line assets, the requirement for extended outages, and the inability to maintain N-1 security during these works, reconductoring would not provide sufficient long term headroom or operational resilience.

Furthermore, the use of high temperature low sag conductors only address thermal limitations across the existing 275kV circuits, and do not materially improve voltage and/or stability constraints.

For these reasons, reconductoring of the existing 275kV overhead lines across the CQ-NQ transmission corridor are not considered economically feasible, and have not been considered further.

(F) Operational Controls and Special Protection Schemes (SPS)

Enhancements to the Wide Area Monitoring, Protection and Control (WAMPAC) system, including fast runback schemes and remedial action schemes, were considered to increase utilisable transfer under contingencies.

While such schemes can provide interim support, they do not address the underlying thermal and stability limitations on the Bouldercombe to Broadsound to Nebo section nor provide enduring capacity

[3] See: https://www.treasury.qld.gov.au/files/Queensland-Energy-Roadmap-2025-25-043.pdf.

uplift required to support new generation or large industrial loads. Accordingly, these are not considered suitable as standalone solutions.

(G) Synchronous Condensers

Additional synchronous condensers were considered to manage system strength and voltage performance as generation mix changes. While these assets provide important grid support functions, they do not increase the thermal transfer capacity across the CQ-NQ corridor. As such, they do not address the identified need and were not progressed as alternatives, although they will be assessed under separate system security processes where appropriate.

(H) Non-Network Solutions

Network support contracts, flexible demand at new industrial sites, and utility scale batteries were considered. While these services can complement transmission, they do not resolve corridor wide power transfer constraints or the need for N-1 secure headroom.

Non-network options are therefore considered as potential complementary solutions to transmission network development rather than wholesale substitutes for network investments.

Multi-Criteria Assessment

A multi-criteria assessment (MCA) of the investment pathways outlined in this Area Plan is shown in Appendix A. This assessment evaluates the merits of investment pathways capable of addressing both capacity needs and emerging condition-related risks across the CQ-NQ corridor (Investment Pathways A to E).

The remaining pathways are not considered standalone options; however, they may complement or operate in conjunction with other investment strategies where appropriate.

The MCA illustrates that Investment Pathway B is the preferred approach based on a range of criteria and considerations compared to the other investment strategies.

Recommended Strategy

Easement and Corridor Readiness

Delivering long-term augmentation across the CQ-NQ transmission corridor requires carefully sequenced works to maintain reliability and network efficiency throughout multi-year rebuilds.

The existing single-circuit assets form the only continuous 275 kV backbone between Central and North Queensland, meaning they cannot be rebuilt in situ without materially reducing transfer capability and compromising supply reliability. Maintaining reliability therefore necessitates securing new or widened easements. As these assets approach end of technical life, easements will be required regardless of the final augmentation pathway to enable their future replacement.

To support both essential end-of-life reinvestment and the ability to meet future triggers for capacity upgrades, new or widened easements must be secured within the 10-year outlook for the Bouldercombe to Stanwell and Broadsound, Broadsound to Nebo, and Strathmore to Ross (via the Reid River cut-in) corridors. Commencing easement activities early aligns with sound planning practice. Proactively identifying, preserving, and acquiring low-regret easement corridors avoids future delays, reduces cost pressures, and maintains flexibility to respond efficiently and prudently to emerging network needs.

Deferring corridor readiness until major load or generation developments are fully committed would expose the network to unavoidable constraints while planning approvals, land acquisition, detailed design, and regulatory processes are undertaken prior to construction.

Market modelling undertaken for the Energy Roadmap shows that delaying this strategy until new generation is committed is highly likely to shift the market onto a higher-cost development pathway. Clarifying future network capability through established planning processes strengthens investor confidence by reducing uncertainty around congestion and marginal loss factors.

Early easement readiness is therefore a prudent, low-regret measure that preserves future credible options, mitigates land-use and conflict risks, reduces long term cost escalation, and mitigates the risk of delays to delivery of efficient transmission developments. This approach positions the network to progress both end of life rebuilds and future augmentations in an efficient and timely manner.

275kV Substations

Substations along the CQ-NQ 275 kV transmission corridor provide essential transformation, switching, protection, and voltage regulation functions required to maintain secure power transfers and support the connection of new load, generation, and storage.

As the transmission network transitions toward higher-capacity double-circuit infrastructure and extended rebuild sequencing, maintaining the condition and capability of both primary plant and secondary systems becomes critical to sustaining reliability, voltage stability, and operational flexibility. Ensuring plant and bus ratings are appropriate to satisfactorily manage changing power flows, and the co-ordinated operation of substation protection and control schemes will be essential for Powerlink to reliably and securely manage higher levels of power transfers.

Targeted renewal of primary and secondary systems to address emerging condition risks are also required to maintain reliability of supply, and ensure these assets are aligned with the strategic development of the corridor.

Ross to Guybal Munjan and Chalumbin 275kV Transmission Corridor

There is an enduring need for the Ross to Guybal to Chalumbin 275kV transmission corridor for the supply of Kidston PHES and major generating plant and load within Far North Queensland.

Powerlink has recently energised the existing coastal Yabulu South to Woree 132kV to 275kV operation. However, it is not possible to consolidate the inland 275kV double circuit transmission corridor and continue to maintain reliability of supply to the Far North Queensland load.

The double-circuit transmission line between Ross and Chalumbin (F857/858) has emerging condition related risks. The most economic strategy comprises of targeted line refit work to the existing overhead

structures to extend the technical and operational life of the asset aligned with the recommendations of Powerlink's Asset Reinvestment Review.

Strathmore SVC

The Strathmore Static VAr Compensator (SVC) continues to provide critical dynamic reactive support and voltage control for the wider North Queensland area. There is an enduring need for the Strathmore SVC to maintain and control voltages within limits prescribed within Schedule 5 of the NER.

There are emerging condition risks identified for the Strathmore SVC secondary systems. Condition related works comprising of targeted replacement are required to maintain reliability of supply.

Powerlink's 2027-32 Revenue Proposal

Consistent with this CQ-NQ Area Plan and the Queensland Government Energy Roadmap, Powerlink has included easement projects within its ex-ante capital expenditure and a contingent project to increase power transfer capability between Central and North Queensland and facilitate the connection of CopperString to the 275 kV network. Powerlink will undertake activities relating to this contingent project subject to relevant triggers being met.

Powerlink has also included condition related works within its Revenue Proposal for network assets having emerging condition or obsolescence risks to maintain reliability of supply.

Appendix A – Multi-Criteria Assessment

Strategy	Investment Pathway/Option	Economics	Constructability	Outages	Easement	Capacity Increase	Efficient Market Operation	Future Load Development	System Strength	Network Reliability and Resilience	Legal and Compliance
A	Bouldercombe to Ross 275kV Life Extension Followed by Rebuild and Reconfiguration	Lowest upfront cost	Line refit works likely to require significant outages and staging	Requires significant outages	No additional easement acquisition required upfront	Deferred increase in power transfer capability	May not facilitate future efficient market operation	May not readily accommodate significant new load development without further augmentation	Maintains current levels of system strength over the medium to longer term	Maintains current levels of reliability and resilience	Compliant
B	Bouldercombe to Ross 275kV Upfront Rebuild and Reconfiguration	Higher cost upfront however aligned to ODP lowest cost outcomes	Allows adjacent construction whilst maintaining security and reliability of supply of the existing network	Moderate levels of outages associated with refit work and cutovers	Easement widening required adjacent to existing alignments	Significant increase in power transfer capability	More likely to facilitate future efficient market operation	Accommodates significant new load development	Improves system strength	Improves network security through additional levels of capacity	Compliant
C	Central to North Queensland 500kV Development	Highest upfront cost	Allows construction on alternate alignment whilst maintaining security and reliability of supply of the existing network	Moderate levels of outages associated with refit work	New easement routes and sites required to accommodate 500kV transmission development	Significant increases in power transfer capability	More likely to facilitate future efficient market operation	Accommodates significant new load development	Improves system strength	Improves network security through additional levels of capacity	Compliant
D	Bouldercombe to Nebo Rebuild 275kV In-Situ on Existing Easement Alignment	Higher upfront cost	Requires significant outages and staging to facilitate rebuild	Requires significant outages associated with insitu rebuild	No additional easement acquisition required upfront	Significant increase in power transfer capability	More likely to facilitate future efficient market operation	Accommodates moderate to significant new load development	Moderate improvements to system strength	Moderate improvement to network security	Not considered compliant
E	Reconductoring and/or Uprating of Existing 275kV Transmission Lines	Lower upfront cost	Requires significant outages and project staging to facilitate the works	Requires significant outages associated with reconducting existing overhead lines	No additional easement acquisition required upfront	Marginal increase in transfer capability through thermal increases. However does not address stability limitations.	More likely to facilitate future efficient market operation	Accommodates moderate to significant new load development	Limited improvement to system strength	Moderate improvement to network security	Further assessment required on compliance