Appendix D Joint planning

This appendix outlines the results of Powerlink's joint planning with the Australian Energy Market Operator (AEMO) and other Network Service Providers (NSPs).

D.1 Introduction

Powerlink undertakes joint planning activities with other Transmission Network Service Providers (TNSPs), Distribution Network Service Providers (DNSPs) and AEMO. The objective of joint planning is to collaboratively identify network and non-network solutions to limitations which best serve the long-term interests of customers, irrespective of the asset boundaries (including those between jurisdictions). The joint planning process results in integrated area and inter-regional strategies which optimise asset investment needs and decisions consistent with whole of life asset planning.

In particular, joint planning seeks to:

- understand the issues faced by the different network owners
- understand existing and forecast congestion on power transfers between neighbouring networks
- understand asset condition-based drivers in neighbouring networks
- identify the most efficient options to address these issues, irrespective of the asset boundaries
- influence how networks are operated and managed, and what network changes are required
- clarify the investment decisions that are likely to progress.

Joint planning begins several years in advance of an investment decision. Depending on the nature of the limitation or asset condition driver to be addressed and the complexity of the proposed corrective action, the nature and timing of future investment needs are reviewed at least on an annual basis utilising an interactive joint planning approach. The joint planning process results in integrated area and inter-regional strategies which optimise asset investment needs and decisions and often leads to a combination of investments by Powerlink and the relevant DNSP (Energex, Ergon Energy or Essential Energy).

Projects where the estimated capital cost of the most expensive feasible network option is greater than $8 million are subject to a formal consultation process under the applicable regulatory investment test mechanism. The owner of the asset where the limitation emerges will determine whether a Regulatory Investment Test for Transmission (RIT-T) or Regulatory Investment Test for Distribution (RIT-D) is used to progress the investment recommendation under the joint planning framework. This provides customers, stakeholders and interested parties the opportunity to provide feedback and discuss alternative solutions to address network needs. Ultimately, this process results in investment decisions which are prudent, transparent and aligned with stakeholder expectations.

D.2 Working and regular engagement groups

Powerlink contributes to a number of working groups and reference groups for joint planning:

- Executive Joint Planning Committee (EJPC)
- Joint Planning Committee (JPC)
- Regulatory Working Group (RWG)
- Forecasting Reference Group (FRG)
- Power System Modelling Reference Group (PSMRG)
- Energy Networks Australia (ENA) working groups
- General Power System Risk Review (GPSRR)
- Operational Transition Points Working Group (OTPWG) and Future Transition Points Working Group (FTPWG)
- AEMO System Security Working Group
- AEMO Integrated System Plan (ISP) including joint planning and submissions to the ISP Inputs, Assumptions and Scenarios Report, ISP Methodology and development of ISP Preparatory Activity reports
- Inter-network Test Reference Committee
- Transgrid for assessment of the economic benefits of expanding the power transfer capability between Queensland and New South Wales (NSW)
- Energex, Ergon Energy and Essential Energy for planning developments and project delivery in the transmission and sub-transmission network.

D.2.1 Executive Joint Planning Committee

The EJPC coordinates collaboration and consultation between AEMO and other jurisdictional planning bodies (JPB) on electricity transmission network planning issues. The EJPC directs and coordinates the activities of the Forecasting Reference Group and the Regulatory Working Group. These activities ensure effective consultation and coordination between JPBs, TNSPs and AEMO on a broad spectrum of perspectives on network planning, forecasting, market modelling, and market regulatory matters in order to deal with the challenges of a rapidly changing energy industry.

D.2.2 Joint Planning Committee

The JPC is a working committee supporting the EJPC to achieve effective collaboration, consultation and coordination between JPBs, TNSPs and AEMO on electricity transmission network planning issues.

D.2.3 Forecasting Reference Group

The FRG is a monthly forum of AEMO and industry forecasting specialists. The forum seeks to facilitate constructive discussion on matters relating to gas and electricity forecasting and market modelling. It is an opportunity to share expertise and explore new approaches to addressing the challenges of forecasting in a rapidly changing energy industry.

D.2.4 Regulatory Reference Group

The RRG is a working group to support the EJPC to achieve effective collaboration, consultation and coordination between JPBs, TNSPs and AEMO on key areas related to the application of the transmission regulatory framework and suggestions for improvement.

D.2.5 Power System Modelling Reference Group

The PSMRG is a technical expert reference group which focuses on power system modelling and analysis techniques to ensure an accurate power system model is maintained for power system planning and operational analysis, establishing procedures and methodologies for power system analysis, plant commissioning and model validation.

D.2.6 Operational Transition Points Working Group

Operational Transition Points are essentially the expansion of the technical operating envelope of the National Electricity Market (NEM) via staged implementation of new limits (Operational Transitions) to successively allow or commission the system into new operating points as the NEM transitions toward 100% instantaneous penetrations of renewables.

The OTPWG is a technical expert working group focused on the Operational Transition Points and the Transition Plan for System Security (see Chapter 3) associated with the power system under the control or influence of AEMO and NSPs. It promotes efficient sharing of information and learnings between NSPs and AEMO.

The OTPWG is to develop processes to identify and evaluate Operational Transition Points across multiple time horizons, with a specific focus on Horizon 1 (2 years ahead). The OTPWG also coordinates with the FTPWG, which focuses on Horizon 2 (2 to 5 years ahead), ensuring continuity and strategic alignment across both near-term and mid-term planning.

D.2.7 Inter-network Test Reference Committee

The Inter-network Test Reference Committee supports consistent application of the NER Clause 5.7.7 inter-network testing framework. It assists project System Integration Steering Committees, the EJPC and JPBs by reviewing test processes, providing guidance to AEMO's test coordinator, supporting guideline development, and agreeing and documenting decisions on whether inter-network testing is required.

Powerlink continues to work closely with AEMO and Transgrid to test and release QNI interconnector capability following the commissioning of the QNI Minor project by Transgrid in mid-2022. The group manages the inter-network test program for this upgrade in QNI capacity, in accordance with Clause 5.7 of the NER.

D.3 AEMO Integrated System Plan

Powerlink works closely with AEMO to support the development of the ISP. The ISP outlines an optimal path for generation, storage and network investments in the NEM to meet customer needs and government policies, at least cost, to 2050.

The ISP reflects the dynamic nature of the power system and the need to continually innovate and evolve inputs, analysis methodologies and development strategies for the future transmission network. Powerlink provides a range of network planning inputs to the ISP consultation and modelling processes, through regular engagement and workshops. Powerlink also reviews the outcomes of the ISP modelling and provides jurisdictional advice on:

- capacity and limitations of inter and intra-regional grid sections
- network options to augment power transfer capability (including project scope and estimated cost)
- Regional Energy Hub capacity and system strength limitations.

Process

Powerlink continues to provide a range of network planning inputs to AEMO's ISP consultation and modelling processes, via joint planning processes, regular engagement, workshops and through formal consultations.

Methodology

More information on the 2026 ISP, including methodology and assumptions, is available on AEMO's website.

Outcomes

The 2026 ISP identified the following actionable projects for Queensland:

- Central to North Queensland Reinforcement (Stage 1)
- Brisbane Area 275kV Reinforcement

The 2026 ISP reclassified QNI Connect from an actionable ISP project (identified in the 2024 ISP) to a future ISP project. AEMO noted that this change was driven by updates to reduce the assumed flexibility of Queensland coal-fired generators and to incorporate newly committed and anticipated battery developments within its modelling framework.

D.4 AEMO System Security Reports

AEMO's 2025 Transition Plan for System Security covers a 10-year outlook period from December 2025 to December 2035. It provides updated forecasts of system strength and inertia requirements, inverter-based resource (IBR) forecasts, and identifies potential shortfalls across the NEM during this timeframe.

As discussed in chapters 2 and 3, declining minimum operational demand, changing synchronous generator behaviour and rapid uptake of IBR continue to present opportunities for delivery of power system security services.

Process

Powerlink has worked closely with AEMO to determine the system strength, inertia and Network Support and Control Ancillary Services requirements for the Queensland region. Powerlink and AEMO reviewed the Queensland fault level nodes and their minimum three phase fault levels and assessed the reactive power absorption requirements.

Methodology

AEMO applied the System Strength Requirements Methodology to determine the Queensland fault level nodes and their minimum three phase fault levels. More information on the System Strength Requirements Methodology, System Strength Requirements and Fault Level Shortfalls is available on AEMO's website.

Outcomes

The 2025 Transition Plan for System Security confirmed the existing minimum fault level requirements at the Queensland system strength nodes. AEMO forecasted system strength deficits of between 24MVA and 287MVA across the Lilyvale, Greenbank and Western Downs nodes between 2027/28 and 2029/30.

Powerlink has applied the best available information to review AEMO's results and is satisfied that no additional investment is required in the 2027/28 to 2029/30 period. Powerlink will continue to monitor developments to maintain demand reliability and system security.

D.5 General Power System Risk Review

AEMO published the 2026 GPSRR in July 2026.

Process

The purpose of the GPSRR is to review:

- a prioritised set of risks comprising contingency events and other events and conditions that could lead to cascading outages or major supply disruptions
- arrangements for managing the identified priority risks and options for their future management
- arrangements for management of existing protected events and consideration of any changes or revocation
- the performance of existing Emergency Frequency Control Schemes (EFCS) and the need for any modifications.

Methodology

With support from Powerlink, AEMO assessed the performance of existing EFCS. AEMO also assessed high-priority non-credible contingency events identified in consultation with Powerlink.

Outcomes

The Final 2026 GPSRR report recommended:

- AEMO support the implementation of load access standards for inverter-based loads to reduce risks related to increasing large load connections
- AEMO and TNSPs extend operational documentation to further support the ability to resecure the system for low probability non-credible contingency events
- AEMO consider the appropriate approach to reducing the likelihood or impacts of multiple prior generation and network outages while minimising impacts to market participants
- AEMO to continue to monitor conditions that may present an increased likelihood or consequence of cascading failure or major supply disruptions
- TNSPs to continue to support the assessment of power system resilience for large non-credible contingency events, particularly supporting the consideration of Remedial Action Schemes (RAS), EFCS or identifying the need for reclassification
- existing studies on voltage control risks be extended to consider the impacts of non-credible contingencies in operating conditions that may present an elevated risk of voltage control related cascading failures
- power system oscillation risks be considered a priority risk for a future GPSRR or through the Transition Plan for System Security.

Table D.1 outlines carry-over recommendations relating to Powerlink from earlier years that remain open in the 2026 GPSRR.

Table D.1 2026 GPSRR ongoing recommendations for Powerlink

Year	Recommendation	Update
2022	New Over Frequency Generator Shedding (OFGS) scheme to manage Queensland over-frequency during Queensland separation.	14 of the 19 generators have implemented the scheme. Three of the remaining five outstanding generators are targeting implementation by December 2026. For the remaining two generators, Powerlink is in the design stage for implementation of the scheme within Powerlink equipment at the connection point. Target implementation date for those sites is March 2027.
2022	Powerlink to implement a Special Protection Scheme (SPS) for the loss of both Columboola to Western Downs 275kV lines.	Site work is complete. The scheme is commissioned from Powerlink's perspective. Powerlink will provide AEMO with test results and an operational guide before AEMO will give clearance to enable the scheme.
2022	Review of wide area monitoring protection and control (WAMPAC) scheme to mitigate risks associated with non-credible loss of Calvale to Halys 275kV lines.	The project scope has been finalised. Estimated commissioning is early 2027.
2023	Powerlink and Transgrid investigate, design and implement an SPS to mitigate the risk of QNI instability and synchronous separation of Queensland following a range of non-credible contingencies.	A working group comprising AEMO, Powerlink, Transgrid, AEMO Victorian Planning and ElectraNet is analysing potential mitigation options. Recent works have involved Powerlink and Transgrid providing feedback on AEMO study results.

D.6 Joint planning with Transgrid – Expanding the transmission transfer capacity between New South Wales and Queensland

QNI Connect is a proposed high-capacity transmission project between Queensland and NSW. It aims to strengthen the NEM by enabling up to 1,000 megawatts of additional transfer capacity between southern Queensland and the New England region. The project was identified as an actionable project in the 2024 ISP. The 2026 ISP changed the status of the project from actionable to a future ISP project.

Should the project become actionable in a future ISP, it will be subject to the RIT-T process for actionable ISP projects.

D.7 Joint planning with Energex and Ergon Energy

Powerlink, Energex and Ergon Energy, participate in regular joint planning and coordination meetings to assess emerging limitations, including asset condition drivers, to ensure the recommended solution is optimised for efficient expenditure outcomes. These meetings are held regularly to assess, in advance of any requirement for an investment decision by either NSP, matters that are likely to impact on the other NSP. Powerlink and the DNSPs then initiate detailed discussions around addressing emerging limitations as required. Joint planning also ensures that interface works are planned to ensure efficient delivery.

Table D.2 provides a summary of activities that are utilised in joint planning. During preparation of respective regulatory submissions, the requirement for joint planning increases significantly and the frequency of some activities reflects this.

Table D.2 Joint planning activities with Energex and Ergon Energy

Activity	As required	Annual
Sharing and validating information covering specific issues	Y	
Sharing updates to network data and models	Y	
Identifying emerging limitations	Y	
Developing potential credible solutions	Y	
Estimating respective network cost estimates	Y	
Developing business cases	Y	
Preparing relevant regulatory documents	Y	
Sharing information for joint planning analysis	Y	
Sharing information for respective works plans	Y	Y
Sharing planning and fault level reports		Y
Sharing information for Regulatory Information Notices		Y
Sharing updates to demand forecasts		Y
Joint planning workshops	Y	Y

There are a number of projects where Powerlink, Energex and Ergon Energy engage on delivery, changes to secondary systems or metering, and other relevant matters which are not covered in this chapter. Since publication of the 2025 TAPR, joint planning has occurred between Powerlink and Energex or Ergon Energy on the following projects:

- Maintaining reliability of supply to Goodna and surrounding area
- Maintaining reliability of supply to Mudgeeraba and southern Gold Coast/Tweed
- Maintaining reliability of supply to Loganlea and surrounding area
- Establish new supply point to southern Cairns area.