Appendix C Joint planning

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

C.1 Introduction

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 National Electricity Rules (NER) require the Transmission Annual Planning Report to outline the results of joint planning between Transmission Network Service Providers (TNSPs), including a summary of the process and outcomes of joint planning[1]. Powerlink's joint planning framework with AEMO and other Network Service Providers (NSPs) is in accordance with the requirements set out in clauses 5.14.3 and 5.14.4 of the NER.

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.

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.

In general, joint planning seeks to:

- understand the issues faced by the different network owners and operators
- understand existing and forecast network limitations between neighbouring NSPs
- identify the most efficient options to address these issues, irrespective of the asset boundaries (including those between jurisdictions)
- influence how networks are operated and managed, and what network changes are required.

Projects where the estimated capital cost of a 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.

C.2 Working and regular engagement groups

Powerlink regularly undertakes joint planning meetings with AEMO, Energy Queensland (as owner of the Energex and Ergon Energy Distribution Network Service Providers (DNSPs)) and Jurisdictional Planning Bodies (JPB) from across the National Electricity Market (NEM). There are a number of working groups and reference groups which Powerlink contributes to:

- Executive Joint Planning Committee (EJPC)
- Joint Planning Committee (JPC)
- Regulatory Working Group (RWG)
- Forecasting Reference Group (FRG)
- Power System Modelling Reference Group (PSMRG)
- NEM Working Groups of Energy Networks Australia (ENA)
- General Power System Risk Review (GPSRR)[2]
- Operational Transition Points Working Group (OTPWG) and Future Transition Points Working Group (FTPWG)
- AEMO's System Security Working Group
- AEMO's 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
- AEMO's System Strength Impact Assessment Guidelines and Methodology
- Queensland-New South Wales Interconnector (QNI) Test Working Group
- Transgrid when assessing the economic benefits of expanding the power transfer capability between Queensland and New South Wales (NSW)

1 National Electricity Rules, clause 5.12.2(c)(12).
2 Refer to Section 6.3.

- Energex and Ergon Energy for the purposes of efficiently planning developments and project delivery in the transmission and sub-transmission network.

C2.1 Executive Joint Planning Committee

The EJPC coordinates effective collaboration and consultation between JPBs and AEMO 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, Transmission System Operators 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.

C2.2 Joint Planning Committee

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

C.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.

C.2.4 Regulatory Reference Group

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

C.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.

C.2.6 Operational Transition Points Working Group

The OTPWG supports the transition toward 100% instantaneous renewable penetration. 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.

The working groups are to support System Security Planning and understand the range of studies, analyses, and trials needed to inform transition points. The working groups will review the Transition Plan for System Security, especially in relation to emerging operational issues that limit transmission network and renewable portfolio utilisation.

C.2.7 QNI Testing Working Group

Powerlink works closely with AEMO and Transgrid to test the interconnector capability between Queensland and New South Wales 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.

C.3 AEMO Integrated System Plan

Powerlink works closely with AEMO to support the development of the ISP. The ISP sets out a roadmap for the eastern seaboard's power system over the next two decades by establishing a whole of system plan for efficient development that achieves system needs through a period of significant change.

During 2024 and 2025 Powerlink provided feedback on the proposed ISP methodology and inputs, assumptions and scenarios for the 2026 ISP.

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 2024 ISP identified the following actionable projects for Queensland:

- QNI Connect as an actionable project to increase transfer capacity between Queensland and New South Wales, improving reliability and market efficiency
- Gladstone Grid Reinforcement
- Central Queensland to Southern Queensland connection[3].

C.4 AEMO System Security Reports

AEMO's 2024 System Security Reports covers a 10-year outlook period from December 2024 to December 2034. It provides updated system strength requirements, inverter-based resource (IBR) forecasts, and identifies potential shortfalls across the NEM during this timeframe.

Declining minimum operational demand, changing synchronous generator behaviour and rapid uptake of variable renewable energy resources combine to present opportunities for delivery of innovative and essential 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 2024 System Strength Report confirmed the existing minimum fault level requirements at the Queensland system strength nodes. New system strength shortfalls of between 105 MVA and 173 MVA were identified (at Lilyvale, Greenbank and Western Downs), linked with decreased energy exports to NSW, with more energy available in that region following the delayed retirement of Eraring Power Station. That change has resulted in fewer thermal units expected to be online economically in Queensland, and lower fault levels than previously projected.

Powerlink has remediation arrangements in place to address the previous shortfall at Gin Gin node and has completed a RIT-T to meet system strength requirements across all Queensland nodes[4].

C.5 General Power System Risk Review

AEMO published the 2025 GPSRR in July 2025.

Process

In accordance with rule 5.20A of the NER, AEMO in consultation with TNSPs prepares a GPSRR for the NEM. The purpose of the GPSRR is to:

- prioritise risks comprising contingency events and other events and conditions that could lead to cascading outages or major supply disruptions
- review current arrangements for managing the identified priority risks and options for their future management
- review the arrangements for management of existing protected events and consideration of any changes or revocation
- review 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 2025 GPSRR report recommended:

- all NSPs manage risks associated with localised aggregated battery energy storage system (BESS) response to remote frequency disturbances
- governments implement regulatory frameworks for emergency backstop capability in all regions. DNSPs implement and test backstop systems, monitor compliance, and develop operating procedures. AEMO refine minimum system load (MSL) models and operational procedures for backstop activation.

[3] Refer to Section 5.3.3 for detail regarding actionable projects for Queensland in the 2024 ISP.
[4] Refer to Section 3.4 for detail regarding Powerlink's System Strength RIT-T.

- governments strengthen governance frameworks for consumer energy resources (CER) technical standards and compliance enforcement. Manufacturers improve compliance and DNSPs monitor for compliance.
- AEMO is currently working on the design of a Queensland OFGS in consultation with Powerlink. The design of the Queensland OFGS scheme has been finalised and are now progressing to implementation.
- while Remedial Action Schemes (RAS) can reduce costs and defer infrastructure investment, they increase system complexity and risk of unexpected interactions. AEMO is to lead an industry-wide project to establish explicit RAS requirements in the NEM.

Carry-over recommendations from 2024 GPSRR include:

- Implementation of a Special Protection Scheme (SPS) for the loss of both Columboola to Western Downs 275kV lines. The loss of both of these lines, which supply the Surat zone, is non-credible but could cause QNI to lose stability.
- Reassess the non-credible contingencies for Central Queensland (CQ) and South Queensland (SQ) SPS settings, taking account of the revised composite and distributed energy resources load model.
- Powerlink and Energy Queensland to identify and implement measures to restore under frequency load shedding (UFLS) load, and to collaborate with AEMO on the design and implementation of remediation measures, including identifying UFLS circuits in reverse power flow.

C.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 is being jointly developed by Powerlink and Transgrid, and is identified as an actionable project in the 2024 ISP.

The project may involve either a 330kV or 500kV overhead transmission line or a Virtual Transmission Line (VTL). It is subject to the RIT-T process for actionable ISP projects.

C.7 Joint planning with Energex and Ergon Energy

Powerlink, Energex and Ergon Energy, participate in regular joint planning and coordination meetings with Powerlink 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 C.1 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 reflect this.

Table C.1 Joint Planning Activities

Activity	Frequency	
	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

C.7.1 Matters requiring joint planning

The following is a summary of projects where detailed joint planning with Energex and Ergon Energy (and other NSPs as required) has occurred since the publication of the 2024 TAPR (refer to Table C.2). There are a number of projects where Powerlink, Energex and Ergon Energy interface on delivery, changes to secondary systems or metering, and other relevant matters which are not covered in this chapter. Further information on these projects, including timing and alternative options is discussed in Chapter 5.

Table C.2 Joint Planning Project References

Project	TAPR Reference
Maintaining reliability of supply to Kamerunga and Cairns northern beaches	Section 5.5.1
Maintaining reliability of supply and addressing condition risks at Ingham South	Section 5.5.2
Maintaining reliability of supply to between Ross and Dan Gleeson	Section 5.5.2

Notes:

(1) Operational works, such as Overload Management Systems, do not form part of Powerlink's capital expenditure budget.

(2) Joint planning is also underway for potential new transmission requirements at the Mudgeeraba, Goodna and Loganlea substations.