CHAPTER 3

Joint planning

3 Joint planning

Key highlights

- Joint planning provides a mechanism for Network Service Providers (NSPs) to discuss and identify technically feasible, cost effective network or non-network options that address identified network needs regardless of asset ownership or jurisdictional boundaries.
- Key joint planning focus areas since the publication of the 2017 Transmission Annual Planning Report (TAPR) include:
  - the Integrated System Plan (ISP) and Power System Frequency Risk Review (PSFRR) with the Australian Energy Market Operator (AEMO)
  - consideration of the economic benefits associated with a potential QNI upgrade with TransGrid
  - the analysis of options to address condition driven reinvestments with Energex and Ergon Energy (part of the Energy Queensland Group).

3.1 Introduction

Powerlink's joint planning framework with AEMO and other NSPs is in accordance with the requirements set out in Clause 5.14.3 of National Electricity Rules (NER).

Joint planning begins many years in advance of an investment decision. The nature and timing of future investment needs are reviewed at least on an annual basis utilising an interactive joint planning approach.

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 and consumers, 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.

The joint planning process is intrinsically iterative, and the extent to which this occurs will depend upon the nature of the limitation or asset condition driver to be addressed and the complexity of the proposed corrective action. In general, joint planning seeks to:

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

Projects where a feasible network option exists which is greater than $6 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 as the regulatory instrument 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.

3.2 Working groups and regular engagement

Powerlink collaborates with the other National Electricity Market (NEM) jurisdictional planners through a range of committees and groups.

3.2.1 Regular joint planning meetings

For the purpose of effective network planning, Powerlink has collaborated in regular joint planning meetings with:

- AEMO on the 2018 Power System Frequency Risk Review (refer to Section 6.3)
- AEMO National Planning and other jurisdictional planners in the development of the 2018 ISP

- TransGrid for the assessment of the economic benefits of upgrading the inter-connector capability between Queensland and New South Wales (NSW) (refer to Section 5.7.12)
- ElectraNet, for the purposes of contributing to the South Australian Energy Transformation project (SAET)
- Energex and Ergon Energy.

3.3 AEMO national planning – Integrated System Plan (ISP)

The Independent Review into the Future Security of the National Electricity Market (Finkel Review) recommended[1]:

> *By mid-2018, the Australian Energy Market Operator, supported by transmission network service providers and relevant stakeholders, should develop an integrated grid plan to facilitate the efficient development and connection of renewable energy zones across the National Electricity Market.*

Powerlink has worked closely with AEMO to support the development of the 2018 ISP. The ISP signals priority development paths in the near to short-term, along with an over-arching long-term strategy.

The 2018 ISP is not the end of the process, but rather the first of many steps, with updates in future years to reflect the dynamically changing nature of the power system and the need to continually innovate and evolve strategies for the future.

Process

Powerlink provided a range of network planning inputs to AEMO's ISP modelling process, supported the development of the ISP through regular engagement, and reviewed the long-term network development strategy and findings. Throughout its development, AEMO conducted workshops and regular coordination meetings to incorporate input from industry. AEMO's public consultation received 68 formal submissions, which are available on AEMO's website.

Methodology

The ISP methodology is outlined on AEMO's website.

Outcomes

The ISP sets out a long-term plan for the efficient development of the NEM transmission network, and the connection of Renewable Energy Zones (REZ) over the coming 20 years. It is based on a set of assumptions and a range of scenarios. This plan will be available on AEMO's website.

3.4 Power System Frequency Risk Review (PSFRR)

The PSFRR is an integrated, periodic review of power system frequency risks associated with non-credible contingency events in the National Electricity Market (NEM).

Process

Powerlink supported AEMO in identifying non-credible contingencies and emergency control schemes that could be within the scope of the PSFRR. From a preliminary list of events for the Queensland region, AEMO, in consultation with Powerlink, ruled out some events and prioritised others for assessment based on criteria consistent with the NER. AEMO shared and discussed initial findings with Powerlink and preliminary versions of the PSFRR. AEMO incorporated feedback from Powerlink into the PSFRR.

Methodology

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

[1] Finkel et al., 2017. Independent Review into the future security of the National Electricity Market – recommendation 5.1, available at http://www.environment.gov.au/energy/national-electricity-market-review.

From these assessments AEMO determined whether further action may be justified to manage frequency risks. Powerlink has reviewed AEMO's work and supports the outcomes of the PSFRR.

Outcomes

The existing mainland NEM Under-Frequency Load Shedding (UFLS) schemes are currently sufficient to contain frequency within the Frequency Operating Standard (FOS) for large under-frequency events. AEMO is currently reviewing the need to modify the mainland NEM UFLS schemes to account for potential over correction.

AEMO, in consultation with Powerlink, identified a need to modify the central Queensland to southern Queensland Special Protection Scheme (SPS) to improve its effectiveness for the increased southerly flows that are projected as variable renewable energy (VRE) generation connects in North Queensland. Additionally, AEMO recommends that a joint study between Powerlink and AEMO be commenced in 2018 to establish the risk of major supply disruption due to Queensland becoming islanded during high export to NSW.

3.5 Joint planning with TransGrid – QNI upgrade

Section 5.7.12 outlines the joint planning being undertaken by Powerlink and TransGrid to assess the economic benefits in upgrading the interconnector capability between Queensland and NSW.

TransGrid and Powerlink are undertaking preparatory work to progress a RIT-T to investigate the net market benefits of options for increasing the transfer capacity between NSW and Queensland. The first stage of this RIT-T consultation is anticipated to commence in the third quarter of 2018.

3.6 Joint planning with ElectraNet – SAET RIT-T

In November 2016 ElectraNet commenced the SAET RIT-T consultation. A feasible option in the RIT-T includes a High Voltage Direct Current (HVDC) Voltage Source Converter (VSC) interconnector between South Australia and South West Queensland.

Powerlink has been working collaboratively with ElectraNet to:

- define the scope and cost of this option
- assess the impact that this option has on the existing power transfer limits of the interconnected NEM
- review the technical assumptions for assessing the market benefits.

3.7 Joint planning with Energex and Ergon Energy

Queensland's Distribution Network Service Provider (DNSP) Energex and Ergon Energy participate in regular joint planning and coordination meetings with Powerlink to ensure that interface works are communicated. These meetings identify, 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 DNSP will then initiate detailed discussions around the need and timing of emerging limitations or asset condition drivers to ensure the recommended solution is optimised for efficient expenditure outcomes[2].

[2] Where applicable to inform and in conjunction with the appropriate RIT-T consultation process.

Table 3.1 Joint planning activities

Activity	Frequency		
	Week-to-week	Monthly	Annual
Sharing and validating information covering specific issues	Y	Y	
Sharing updates to network data and models	Y	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	Y	
Sharing information for respective works plans			Y
Sharing updates to demand forecasts			Y
Joint planning workshops			Y

3.7.1 Matters requiring joint planning

The following is a summary of projects where detailed joint planning with Energex and Ergon Energy has occurred since the publication of the 2017 TAPR. There are a number of projects where Powerlink and Energex and Ergon Energy interface on delivery, changes to secondary systems or metering, and other relevant matters which are not covered here. Further information on these projects, including timing and alternative options is discussed in Chapter 5 (refer to Table 3.2).

Table 3.2 Joint planning project references

Project	Reference
Cairns 132/22kV transformer replacement/retirement	Section 5.7.1
Townsville South – Clare South – Collinsville North 132kV transmission lines	Section 5.7.2
Dan Gleeson secondary systems replacement	Section 5.7.2
Ingham South 132/66kV transformer replacement	Section 5.7.2
Lilyvale 132/66kV transformer replacement	Section 5.7.4
South Pine – Upper Kedron 110kV transmission lines	Section 5.7.9
Rocklea – Sumner – West Darra 110kV transmission lines	Section 5.7.9
Mudgeeraba 275/110kV transformer replacement/retirement	Section 5.7.10

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