Powerlink Ref:A2853014

28 February 2018

Australian Energy Market Operator
ISP@aemo.com.au
GPO Box 2008
Melbourne VIC 3001

Attention: Audrey Zibelman

Dear Ms Zibelman

AEMO Integrated System Plan Consultation – Response to Questions 2.1, 3.1, 3.2 & 4.1

Powerlink appreciates and welcomes the opportunity to provide further input to the Australian Energy Market Operator's (AEMO's) consultation paper on the Integrated System Plan (ISP).

This submission relates specifically to consultation questions 2.1, 3.1 and 4.1 and builds upon Powerlink's prior submission regarding questions 1.1 and 1.2. Powerlink also endorses and refers AEMO to the matters raised in the submissions from Energy Networks Australia, and the Queensland Government's Department of Natural Resources, Mines and Energy.

As expressed in Powerlink's prior submission, Powerlink agrees with the intent of the ISP and appreciates the consultative approach in which AEMO has progressed this work. Powerlink sees significant value in an overarching analysis of the national energy supply system, to better inform each participant's decision making. As a transmission network service provider (TNSP) with jurisdictional planning responsibilities, Powerlink will build on the ISP analysis, taking account of regional considerations, detailed design options and joint planning with distribution network service providers. Whilst generators will make investment decisions independently, the enhanced provision of information will better support their long-term decision making. This will contribute to achieving a coordinated approach to investment decisions, benefitting electricity consumers.

There are three key areas to which Powerlink would like to draw AEMO's attention:

1. Application of the RIT-T will be significantly enhanced by the provision of nationally consistent scenarios identified through the ISP process, each with probabilities, generation assumptions and modelled network projects;

2. Powerlink agrees with the Renewable Energy Zones (REZs) identified for Queensland, which are focussed on strategically-valuable generation that might otherwise not be developed; and

3. Powerlink supports AEMO's view that it is appropriate for an upgrade of the Queensland – New South Wales Interconnector (QNI) to be re-investigated. Powerlink is collaborating with TransGrid regarding this analysis and expects to formally initiate the evaluation consultation in mid 2018.

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The remainder of the submission addresses questions 2.1, 3.1 and 4.1 as outlined in AEMO's ISP consultation paper.

2.1 What are the key factors which can enable generation and transmission development to be more coordinated in future?

The NEM is a complex system, comprising different:

- infrastructure components: fuel supply, generation, transmission, distribution, energy storage and loads;
- participants: consumers, industrial loads, generators, retailers, networks, demand response aggregators, technology providers, investors and policy makers; and
- geographical regions, each with different climatic conditions and opportunities.

This environment is characterised by highly distributed decision making, where the actions of one participant can have a significant impact on other participants and the effectiveness of the overall energy supply system. It also gives rise to high levels of uncertainty, which favours incremental decision making.

Powerlink sees significant value in the provision of information based on an overarching analysis of the national energy supply system to better inform each participant's decision making and considers that AEMO is well positioned to perform such an analysis and share the results.

In particular, Powerlink considers there would be particular value from guidance on:

- **Appropriate scenarios and weightings.** Given the high degree of uncertainty, it is difficult for TNSPs to robustly identify and defend the selection of scenarios used as the basis for an investment proposal. AEMO's role as an independent national system planner makes it well suited to develop such scenarios and probabilities through a consultative process which may then be used by TNSPs for RIT-T consultations; and
- **Co-optimised generation plans and model network projects**. The performance of any proposed network investment may be impacted by assumptions regarding subsequent expansion or closure of generation as well as network investment elsewhere in the NEM. Ensuring a national focus in identifying and sharing these background factors will allow each TNSP to focus specifically on their region and detailed options relating to the proposed investment when undertaking a RIT-T consultation.

These high-level inputs would provide clear focus for more detailed investigation by each TNSP, including:

- Consideration of non-network solutions;
- Detailed investigation of various design options;
- Co-optimisation with asset management plans; and
- Joint planning with distribution network service providers.

Such an arrangement, combining national and local perspectives, will maximise the cost-effectiveness of network development, to the benefit of consumers. This, in turn, would help to facilitate the development of generation that is in the best interests of consumers.

3.1 Does this analysis capture the full range of potential REZs in eastern Australia?

Powerlink supports the potential REZs which have been identified within Queensland.

Powerlink understands a REZ to be a coordinated network initiative to support the development of strategically valuable renewable resource . While the development of the REZ itself is important, another important aspect is whether there is sufficient downstream network capacity between the renewable generation and the load it will supply.

In recent years, Queensland has experienced a significant investment in solar PV generation, both grid connected and behind the meter. AEMO's resource mapping confirms that there is abundant solar resource throughout most of Queensland, including many locations in close proximity to the existing network.

Queensland also has excellent potential for wind and hydro generation. In contrast to solar PV, these resources are abundant in specific locations that can be remote from the existing network. Given the diverse operation of wind and hydro generation to that of solar PV, this generation is of significant strategic value to the NEM. However, as noted in AEMO's consultation document, the absence of existing network in proximity to these strategically-valuable resources may discourage their development.

The proposed Queensland REZ locations nominated in the ISP consultation document align with areas of wind and hydro availability. This should enable the ISP process to investigate the economic merit to consumers of unlocking these resources.

Nevertheless, Powerlink considers that it is both inevitable and appropriate that renewable generation will be developed wherever there is existing network due to lower connection costs. The ISP modelling should consider how this may occur.

A specific instance of a proposed REZ is the Queensland Government's proposed Clean Energy Hub in North Queensland. An expression of interest process run last year confirms that there is significant interest in developing diverse renewable energy projects.

4.1 Have the right transmission options been identified for consideration in the ISP?

Powerlink supports AEMO's view that it is appropriate to reinvestigate an upgrade of the Queensland – New South Wales Interconnector (QNI). Powerlink is collaborating with TransGrid regarding this analysis and expects to formally initiate the evaluation consultation in mid 2018.

Within Queensland, there are three different forms of augmentation which are possible:

- **Modest incremental augmentations to the existing network**. The smaller nature of these augmentations means they can closely align to the need and the potential risk of an underutilised investment is low.

- **Development of a new Alternating Current (AC) transmission line**. Transmission augmentations have the potential to play a dual role facilitating the:

    1. flow of power across a region (e.g. from north to south); and

    2. connection of resources along a circuit's length

    In Queensland's context, within the 25 year window considered by the ISP, there is the potential for investment in the transmission backbone from north to south, in response to generation development and/or as some existing circuits reach the end of their usable lives.

    Rather than rebuilding new circuits on the same alignment, alongside other network, there is the potential to construct this network further west, allowing it to traverse land with higher solar yield and lower population density (and facilitate new solar generation development). As this approach would likely cost more than the first option, Powerlink considers there is merit in evaluating whether the additional benefits achieved for consumers would outweigh the additional costs. To facilitate the cost-effective connection of generation along the circuit's length, this option would need to use AC technology.

- **Parallel High Voltage Direct Current (HVDC) network**. Implementation of a new HVDC link along the Queensland coast could potentially provide capacity from north to south at a lower cost, relative to a capacity-comparable AC investment. Such an investment could also reduce the transmission losses incurred transferring power from North and Central Queensland to South East Queensland. However, there are limited options to stage the implementation of such an investment. Such a large development would need to be coordinated with significant generation development to ensure it was effectively utilised. A HVDC link operating in parallel with Queensland's existing AC backbone could also facilitate modest capacity improvement on the existing AC network, through the use of smart controls. In contrast to an AC option, the ability for generation to connect into a HVDC circuit along its length is limited, due to the high cost of HVDC converter stations.

Powerlink would support the inclusion of these high-level options in the ISP analysis. Where the ISP identifies that a network option may be warranted, Powerlink will build on the high-level ISP analysis through a RIT-T consultation that takes account of regional considerations, detailed design options and joint planning with distribution network service providers.

Conclusion

Powerlink appreciates the collaborative manner in which AEMO is developing the ISP and looks forward to continuing to work with AEMO in support of the initiative.

If you have any questions in relation to this submission, please contact Damian Vermey, General Manager Technology and Planning.

Yours sincerely

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