28 April 2023

Attention: Merryn York
Executive General Manager System Design
Australian Energy Market Operator
Level 22, 530 Collins Street
MELBOURNE VIC 3000

By email: *forecasting.planning@aemo.com.au*

Dear Ms York

Powerlink Queensland Submission
Draft ISP Methodology Update March 2023

Powerlink Queensland (Powerlink) welcomes the opportunity to provide feedback on the Draft Integrated System Plan (ISP) Methodology update for March 2023 and recognises its importance in shaping forecast and planning outcomes of the National Electricity Market (NEM).

Powerlink already has actively engages with the Australian Energy Market Operator (AEMO) through Joint Planning meetings, various workshops and reference groups. Regarding the 2023 ISP Methodology update, we broadly support all the proposed changes made in the consultation paper.

Powerlink acknowledges these updates take steps towards better capturing risk and resilience in the ISP modelling, as well as a closer representation of the electricity network. We anticipate these updates will be incorporated in future ISP publications, with further improvements to come.

A response to each of the eight updates is detailed in our submission below, with some recommendations for further clarity and suggested extensions to the proposed changes.

If you have any questions in relation to this submission or would like to meet with Powerlink to discuss this matter further, please contact Joe Hemingway.

Yours sincerely

J. Bridge

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Executive General Manager, Energy Futures

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1. Transmission project lead time uncertainty

Powerlink agrees that there continues to be uncertainty around deliverability timeframes of transmission projects due to supply chain issues affecting material and equipment delivery, workforce and skills shortages, and engagement time with communities and project stakeholders.

Powerlink supports AEMO's preferred approach to revise the Expected in-service dates (EISDs) to reflect project delay factors. This is an evolving situation and the potential delivery risks depend on many factors, including the full set of transmission projects being proposed across the NEM at any one time. There are also actions that the Transmission Network Service Providers (TNSPs) can take to mitigate some of the risks and which Powerlink is pursuing.

As a result, Powerlink recommends that AEMO retains flexibility on revising the EISDs during the ISP development process rather than fixing them at this stage. Revisions can be informed by draft results of deliverability timeframes and managed through already established and ongoing joint planning activities with TNSPs. This would enable the most up-to-date and accurate information on timeframes to be incorporated in the ISP modelling from project proponents.

2. Impact of fossil-fuelled generation on REZ limits

Powerlink supports further consideration of how Renewable Energy Zone (REZ) limits are dynamically formulated as the energy system transitions away from fossil-fuelled generation.

Powerlink supports AEMOs approach to include fossil-fuelled generators in the specific terms in the transmission limits for REZs, so these limits could dynamically account for increased transfer capacity of renewable generation where there is reduced or no output from fossil-fuelled generation sources.

However, Powerlink also notes that this is not a one-to-one relationship and that the impact of a reduction in fossil-fuelled generation is dependent on the location, technical characteristics and expected future operation of these fossil-fuelled generators, which the constraint equations would need to approximate the impact of these factors.

3. Network losses for REZs and sub-regions

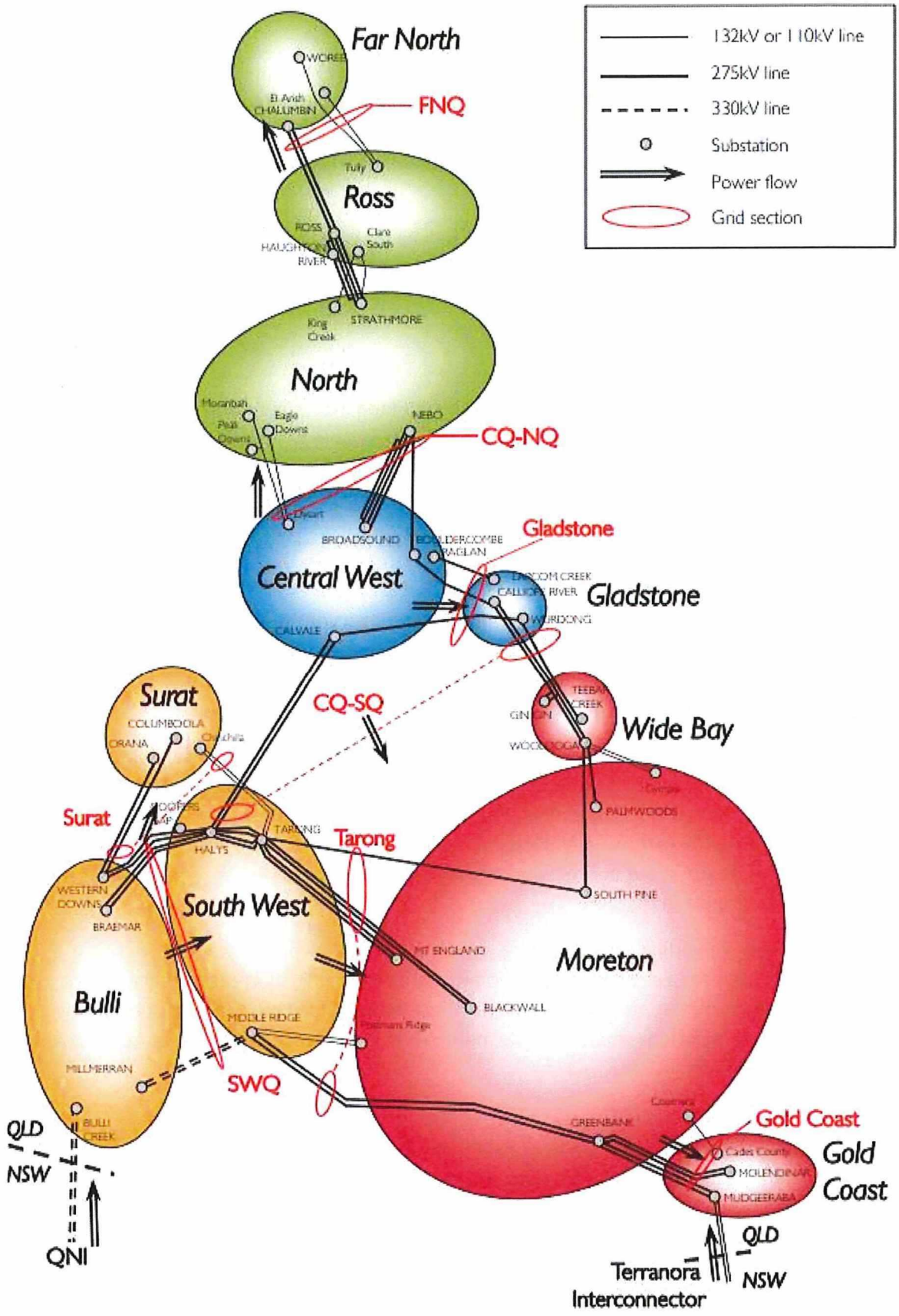
Powerlink supports the creation of new sub-regional loss equations aligning to updates made in the 2023 Draft IASR on the sub-regional representation in the ISP modelling. Powerlink can provide further guidance on the derivation and use of loss equations for the ISP modelling between sub-regions in Queensland, which are already incorporated into Powerlink's market models.

To better align Powerlink's and AEMO's representation of Queensland for regional and national planning purposes, Powerlink recommends a re-adjustment to AEMO's proposed definition of the cut-set between the newly created Central Queensland (CQ) and Northern Queensland (NQ) sub-regions.

In Powerlink's Transmission Annual Planning Reports, the major flow path between CQ and NQ has always been the cut-set between Powerlink's defined Central West zone and the North zone, shown in Figure 1 below. In contrast, AEMO have proposed the cut-set for CQ and NQ to be between Powerlink's defined North zone and Ross zone.

While Powerlink agrees the flow path between the North and Ross zone would improve the sub-regional representation of Queensland, the flow path between the Central West zone and North zone is more informative for representing major flow paths, highlighting congestion (particularly where future large generation assets are located), and determining future transmission augmentation options.

Figure 1: Grid section of Powerlink defined zones in Queensland



Source: [Powerlink 2022 Transmission Annual Planning Report]

Figure 1 proposes that the definition of NQ would include the Far North, Ross, and North zones. CQ would be defined as the Central West zone. Powerlink can define these inter-zonal flow paths in more detail through joint planning activities.

In lieu of a more granular representation of the network in the ISP modelling, Powerlink supports the option for the inclusion of marginal loss factor (MLF) equations for intra-regional flow paths. MLFs could also be a contributing factor for selecting viable augmentation options i.e. the transmission augmentation would be assessed on alleviated losses and constraints, in addition to increased generation and/or transfer capacity.

Powerlink recognises the challenges of formulating dynamic MLFs at a sub-region level to represent changing MLFs to individual generators with existing static MLFs. Powerlink agrees that this a step towards a more accurate reflection of losses in key flow paths, so long as this approach is taken holistically to avoid penalising certain sub-regions.

4. Assumed renewable energy resource quality

Powerlink supports AEMO's proposal to undertake a desktop assessment of land use data in REZs as an initial screening for sites that may be unsuitable for renewable generation development due to environmental, ecological, cultural heritage, land planning, or other proximity considerations.

Powerlink also supports AEMO's approach to revise the percentages of the wind resource quality tranches in the consultation paper, as a way to better align resulting REZ resource quality with the performance of recent wind farm developments.

Powerlink suggests AEMO publish the assumptions and impacts of these step-by-step changes more clearly to stakeholders, which could be in the form of a separate sub-report and assumptions book. This would provide greater context and insights into the methodology around such critical parameters such as REZ resource quality, and also REZ resource limit determinations.

A recent example for this suggestion is the proposed changes to capacity factors in REZ Q1 Far North QLD in the Draft 2023 IASR inputs and assumptions workbook. Despite additional land being screened unsuitable in this REZ, capacity factors increased instead of decreased when compared to the 2022 ISP REZ capacity factors. AEMO later clarified that this was due to the land being screened unsuitable, therefore ruling out poorer wind resource locations, which increased the average wind capacity factors available in that REZ.

For future updates, Powerlink considers the availability and quality of renewable resources is a worthwhile candidate for a separate publication for consultation. The increasing reliance on renewable energy resources may shift to a point where meeting load requirements during low renewable generation periods would become more valuable than meeting load requirements during typical peak load periods.

5. Potential inclusion of a value of carbon emissions

Powerlink acknowledges plans for the National Electricity Objective (NEO) to be amended to include an emissions reduction objective, and agrees with AEMO's approach to include a placeholder for a potential additional class of market benefit relating to emission reductions in the Cost Benefit Analysis (CBA) guidelines.

This approach helps to account for the influence of reducing emissions in selecting the Optimal Development Path (ODP), which Powerlink recognises is still preliminary and anticipates further information will be provided for consultation from AEMO and/or the Australian Energy Regulator.

6. Consumer risk preferences

Powerlink agrees with the growing need for consideration to how consumer risk preferences are accounted for in the ISP modelling, which is moving beyond professional judgement in how Candidate Development Pathways (CDPs) are assessed.

Powerlink supports the consideration of applying a quantifiable evidence-based consumer risk preference metric, anticipating that further work on this will be available for consultation. While acknowledging the ongoing and future risks to project delivery as outlined in section 1, Powerlink would be cautious on placing a higher ranking on CDPs where the risks of project timeline slippage are mitigated, albeit at a higher initial price.

7. Dispatch behaviour of storage devices

Energy storage is a key element in a power system that is predominantly based on weather-dependent supply. Energy storage of different types provide value for different applications to meet power system security as well as energy balancing across different timescales. As the ISP considers the lowest cost resource mix, the operation of the energy storage devices is critical to determine the capacity and duration required to achieve reliability of supply.

Consequently, Powerlink is highly supportive of any measures that mitigate the 'perfect foresight' issue.

AEMO's proposal to apply a discount factor to the storage capacity (MWh), of shorter-duration storages appears to be a blunt yet effective way to account for how these devices operate that are not always aligned to meeting the exclusive energy needs of the power system.

This could include factors such as:

- meeting localised needs to cover an individual's load or portfolio's contracted position,
- participation in the Frequency Control Ancillary Service (FCAS) markets,
- inaccuracy of short-term forecasts, and
- the limitations on decisions for short duration devices in how they would optimise dispatch with finite energy storage over time particularly compared to medium or long duration storages.

Powerlink acknowledges that addressing 'perfect foresight' and representing more realistic operation of storage is not a solved problem, while this proposal is a positive first step, further work and refinement to address this issue will be necessary over time.

8. Duration of demand-side participation response

Powerlink supports AEMO's approach to limit the duration of reliability response of Demand-side participation in line with market observations and expectations.

This provides a more realistic assumption that better captures risk and resilience to the system.