



14 February 2022

Daniel Westerman  
Chief Executive Officer  
Australian Energy Market Operator (AEMO)

Submitted via email: [ISP@aemo.com.au](mailto:ISP@aemo.com.au)

Dear Mr Westerman,

### **AEMO'S DRAFT 2022 INTEGRATED SYSTEM PLAN (ISP)**

Origin Energy Limited (Origin) welcomes the opportunity to provide feedback on the draft 2022 ISP.

Origin supports efficient and timely transmission augmentations, appropriately coordinated with generation investment to facilitate the transition. Our submission focuses on areas where we consider there is scope for additional analysis, transparency, and clarity to support the timely implementation of the ISP. Our main points are summarised below with more detail provide in the subsequent sections:

- **Impractical modelling outcomes:** In some instances, there is a disconnect between the modelling outcomes and what would be reasonably expected to occur in practice. To help maintain confidence in the ISP, more analysis and explanation is needed to bridge this gap and give stakeholders a better understanding of how AEMO's projections are expected to be practically realised.
- **Decision rules increase uncertainty:** The 'decision rules' that govern whether transmission investment can progress are unclear and seem to be inconsistently applied. This increases regulatory uncertainty for grid augmentations. The process for selecting these rules and how they will be applied should be clear and transparent.
- **Cost transparency:** To improve transparency, the final ISP should include commentary on the likely consumer impacts of the recommended transmission build.

#### Disconnect between modelling outcomes and what is reasonably practical

Some of the modelling outcomes seem impractical and runs the risk of undermining confidence in the Plan. AEMO should therefore review the outcomes of its generation modelling ahead of the final ISP and explain how they are expected to be achieved in practice, and the extent to which this impacts the efficacy of the Plan. Some examples are discussed below:

- **New England REZ:** Under the step change scenario, in the New England REZ. 3.4GW of wind is forecast to be commissioned within a single year (2027-28). However, this outcome seems unlikely given the lead time involved in commissioning and connecting projects. In addition, the draft predicts New England will host 6GW of renewable capacity by 2028-29 with a total network capacity of 3.1GW. It is not clear if this level of overbuild of renewables is realistic. This also seems inconsistent with the draft ISP's own forecasts of expected transmission curtailment levels in the New England REZ, which would imply a lower level of overbuild.

- *Power system security*: Origin welcomes the discussion provided in Appendix 7 on power system security but considers that more analysis is needed.
  - Specifically, the final ISP should clearly set out power system security requirements and the implications these have for the generation mix and optimal development path. The draft ISP models accelerated coal closures due to economic reasons, but it is not clear how the system would remain stable, secure and in balance in those scenarios with higher levels of renewable penetration and lower firming capacity. Better incorporating power system security requirements could have an impact on outcomes. For example, depending on which options minimise total system costs, an increase in power system requirements with higher level of VRE penetration could show the need for more synchronous resources or it could alter the timing of interconnectors as they could provide some of these services.
  - The discussion in Appendix 7 focuses on the progressive change scenario. Given that the most likely scenario is step change, the commentary should focus on this scenario instead. This would help stakeholders better assess power system security risks under that scenario.

The ISP should set out, under each scenario:

- the appropriate level of synchronous generation or resources such as synchronous condensers required to keep the system secure and in balance with higher levels of renewable penetration; and
- the level of renewable penetration that the grid is capable of hosting given power system security requirements.

We understand that AEMO's engineering framework is examining these issues; however, they should be incorporated into the final 2022 ISP given how significant generation outcomes are in driving the efficient and timely augmentation of transmission investment under the optimal development path.

#### Risk of transmission delays and cost overruns

AEMO should stress test the risk of transmission build delays or the impact of cost overruns under each scenario. This could be achieved through sensitivity analysis examining:

- The impact of transmission costs being at the upper bound of AEMO's estimates on the cost-benefit analysis and optimal development path.
- The impact of delays in delivering committed transmission projects due to supply chain constraints or other construction issues on outcomes.

#### Decision rules

The ISP includes 'decision rules' that govern whether transmission investment can progress. We understand that the purpose of these decision rules is to ensure transmission augmentation only goes ahead if it is in the long-term interest of consumers. We generally support the need for rigour when it comes to transmission investment.

However, it is unclear how decision rules are set, which party is responsible for implementing and enforcing them, why some projects have them but not others and at which point in the regulatory process they are meant to be applied. For example, it is unclear whether transmission businesses would need to satisfy the rules once the regulatory investment test for transmission (RIT-T) is complete before they can proceed to recover costs through a contingent project application; and whether the rules would be

assessed through an AEMO or AER process. This creates uncertainty for transmission augmentations. AEMO should provide more information on how it intends to apply these rules and how they have been chosen.

The draft 2022 ISP includes decision rules for VNI West and HumeLink, while Marinus Link is no longer subject to these rules compared to the 2020 ISP. The remaining actionable ISP projects are also not subject to decision rules. This means that some projects have an easier path to approval than others and the final ISP should explain why that is the case.

In addition, one of the decision rules for HumeLink in the draft 2022 ISP is that augmentation cannot progress if after completion of early works:

*“There are new commitments that increase the likelihood that either: (i) material volumes of existing dispatchable capacity are retained in New South Wales; or (ii) material volumes of new dispatchable capacity are developed in New South Wales beyond what is currently assumed in the Step Change scenario”.<sup>1</sup>*

This is difficult to implement transparently as it is open to interpretation e.g., it is not clear what would constitute “material volumes” of capacity. This creates uncertainty for this project, which could lead to unnecessary regulatory delays. A similar rule exists for VNI West.

#### Transparency of costs

The optimal development path is projected to yield weighted net market benefits of \$29.4 billion for \$12 billion’s worth of network augmentation. While it is not in the remit of the ISP to project net consumer impacts, given that augmentation is funded by load, it would be useful for transparency purposes for the final ISP to provide commentary on the likely effect of the optimal development path on retail bills. This could include commentary on the likely impact on both wholesale and transmission cost components of the bill.

#### Transmission cost assumptions

The draft 2022 ISP identifies five augmentation options for the New England REZ in Appendix 3 of the document. The cost of most of these options range from \$1.08 million/MW to \$1.76 million/MW based on the transmission cost database used to model the draft ISP.

However, the actionable ISP project for this REZ is an additional option (Option 6, the New England REZ Transmission link) which the draft ISP states increases transfer capacity to 3.1GW with an expected cost of \$1.9 billion. This is equivalent to \$0.62 million/MW which is significantly lower than the other options. It is not clear why this would be the case, which undermines confidence in the estimate. It would be useful to understand what is driving the difference between the original options and the now preferred choice. AEMO should also examine its transmission cost assumptions for further such inconsistencies.

#### REZ design reports

We understand that REZ design reports may be triggered by AEMO for REZs that require coordination of both generation and transmission infrastructure within 12 years.

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<sup>1</sup> AEMO, Draft 2022 ISP, p. 66

While acknowledging that REZs are being progressed by some jurisdictions separate from the national framework, this is not the case in all regions. In addition, the development of REZs is still in early stages in some regions and are not yet at a detailed design stage. There is therefore value in AEMO producing reports for REZs that have not yet commenced design work. The reports would provide useful information to support investment decisions and ensure the zones are efficiently utilised once actioned.

AEMO should also consider providing a detailed, interactive map of the zones (i.e., the exact boundaries, overlaid with existing and proposed transmission lines, sub-stations etc.) to help project proponents make investment decisions. This could be an expanded version of AEMO's interactive forecasting and planning map,<sup>2</sup> or it could be a REZ-specific tool which builds on existing resources such as the National Maps tool.<sup>3</sup>

### Consistency with the NSW Roadmap

The NSW Government is progressing its Roadmap through its Infrastructure Investment Objectives (IIO) Report which sets out a generation and storage investment pathway to 2029. The draft 2022 ISP generation outcomes do not appear to be aligned with the IIO. Under the draft ISP's most likely scenario, the Central-West Orana REZ would install 3 GW of capacity by 2026-27, increasing to 5 GW by 2030. However, the Roadmap plans for 3.69GW of capacity by 2029. This creates confusion and sends mixed signals to investors on the likely investment opportunities that exist in the REZ.

To the extent practicable, the ISP should use the outcomes and objectives of the Roadmap as an input into its modelling, so that the final ISP is consistent with the NSW Government plan. Where they diverge, the final ISP should clearly explain why this is the case (e.g., if this is due to different modelling assumptions).

### The role of hydrogen

Origin supports the inclusion of hydrogen in the modelling and makes the following comments on the role of electrolysers and hydrogen pipelines for AEMO to incorporate into its modelling in future ISP updates:

- Hydrogen, through operating electrolysers in a flexible manner (flexible electrolysis), can play a versatile role, including as load, firming capacity and long-duration storage, to manage higher levels of renewable penetration:
  - The effective duration of storage from an electrolyser could exceed 8 hours once capital cost and renewable energy prices decrease over time.
  - Electrolysis load can soak up excess renewable energy to reduce curtailment, particularly when located near or within REZs.

As the capital cost of electrolysers continues to fall, they will be able to be operated more flexibly and provide storage/firming services for longer durations at a competitive price.

- The use of hydrogen pipelines instead of electrical transmission lines could provide an alternative solution for transporting energy and may mitigate social licence issues in the future. Hydrogen pipelines also allow storage of energy to support renewable resources.

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<sup>2</sup> See <https://www.aemo.com.au/aemo/apps/visualisations/map.html>

<sup>3</sup> See <https://nationalmap.gov.au/>

Should you have any questions or wish to discuss this submission further, please contact Sarah-Jane Derby at [Sarah-Jane.Derby@originenergy.com.au](mailto:Sarah-Jane.Derby@originenergy.com.au) or on (02) 8345 5101.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Steve Reid', with a stylized flourish at the end.

Steve Reid

Group Manager, Regulatory Policy