

02 February 2018

Ms Audrey Zibelman
Chief Executive Officer
Australian Energy Market Operator
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Melbourne VIC 3000

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Dear Ms Zibelman

Integrated System Plan Consultation Paper – Modelling submission

Energy Networks Australia welcomes the opportunity to lodge this submission in response to the Australian Energy Market Operator's (AEMO) Integrated System Plan (ISP) consultation paper.¹

Energy Networks Australia represents Australia's energy grid companies, supporting all Australian customers with over 900,000 km of electricity transmission and distribution lines and almost 90,000 km of gas distribution mains. We strongly support AEMO's role in developing an ISP, which has the potential to provide a significant step forward in facilitating lower cost, reliable and secure energy solutions through integrated, strategic nationally-coordinated planning.

Energy Networks Australia notes that AEMO's consultation paper seeks early submissions in relation to its ISP modelling, given its objective of delivering its first ISP by mid-2018. Our attached submission therefore responds to the modelling issues raised in the consultation paper. Energy Networks Australia intends to lodge a further submission in relation to the remaining issues and questions by 28 February 2018.

The attached submission comments on the scope and purpose of the ISP, as well as addressing AEMO's specific modelling questions. The key points in our submission are:

- » Energy Networks Australia supports the ISP, which should provide the first step towards a genuinely strategic approach to coordinated generation and network planning for the NEM.
- » Energy Networks Australia welcomes AEMO's consultative approach in developing the ISP, including the establishment of technical working groups.
- » The ISP should ensure that appropriate consideration is given to the contribution that distribution networks can make in an integrated system plan. This

¹ AEMO Integrated System Plan Consultation, For the National Electricity Market, December 17.

contribution includes supporting transmission upgrades or enabling distributed energy resources (DER) to provide low cost energy solutions.

- » AEMO's 'bookend' scenarios should be revisited so that they provide an appropriate range of values for all input parameters.
- » The scenarios should include an appropriate range for the uptake of DER, rather than treating DER uptake as a sensitivity.
- » At least one of AEMO's scenarios should include the full adoption of the QRET and VRET targets to 2030 and 2025 respectively, in accordance with the commitments made by the Queensland and Victorian State Governments.
- » AEMO should clarify how projections of coal plant closures will be addressed in its modelling approach.
- » Energy Networks Australia would welcome clarification that the sensitivities will apply to each of the scenarios, not just the 'neutral' case.
- » Energy Networks Australia considers that AEMO should retain the flexibility to introduce new sensitivities or vary its scenarios as it develops the ISP.

If AEMO would like to discuss any points raised in this submission, please contact Dr Stuart Johnston, Energy Network Australia's Executive Director, Network Transformation on (02) 6272 1513 or sjohnston@energynetworks.com.au.

Yours sincerely,



Andrew Dillon
Chief Executive Officer

Energy Networks Australia's submission on ISP modelling

Scope and purpose of the ISP

Energy Networks Australia agrees with AEMO's view that the scope and purpose of the ISP requires enhancements to its current modelling approach. In particular, it is important that AEMO's analysis consider the full supply chain, including the potential contribution from distribution networks to address constraints or support transmission upgrades, and the role of distributors in enabling DER solutions to access the market.

Energy Networks Australia regards the ISP as the first step towards a genuinely strategic approach to integrated generation and network planning for the NEM. The ISP is intended to promote strategic transmission projects to support REZs and technological developments, as explained by the Finkel Review:²

“Incremental planning and investment decision making based on the next marginal investment required is unlikely to produce the best outcomes for consumers or for the system as a whole over the long-term or support a smooth transition. Proactively planning key elements of the network now in order to create the flexibility to respond to changing technologies and preferences has the potential to reduce the cost of the system over the long-term.”

In many respects, therefore, Energy Networks Australia regards the ISP as being a potential 'game changer' in terms of delivering an integrated strategic generation and network plan for the NEM. Jurisdictional planning authorities can then build on this national perspective, taking into account regional considerations and joint planning with distribution network service providers. Whilst generators will make investment decisions independently, the enhanced provision of information will support their long-term decision making. This will contribute to achieving a coordinated approach to investment decisions, benefitting electricity consumers.

² Dr Alan Finkel, Independent Review into the Future Security of the National Electricity Market, June 2017, page 112.

Modelling questions

Energy Networks Australia's response to AEMO's two modelling questions are set out below.

Question 1: The material questions the ISP seeks to address are in Section 1.3.1 of the consultation paper. Are there any other questions the ISP should address?

Section 1.3.1 of the consultation paper explains that the scenario analysis for modelling purposes should reflect the key questions the ISP is seeking to address. The purpose of the ISP is intended to be captured by the following question:

- » What is the best way to achieve the policy objectives of affordable, reliable, secure power and meeting emissions targets?

Energy Networks Australia notes that the above question is very broad in its expression and, therefore, does not provide much context for the ISP. As an alternative, the following question could provide more context by drawing on language from the Finkel Review³:

- » What is the optimal power system design to enable the connection of renewable energy resources, including through inter-regional connections, to deliver affordable, reliable and secure power in accordance with Australia's emissions targets?

In addition to the overarching question noted above, AEMO proposes a number of further guiding questions, which are listed from (a) to (d) below⁴. Energy Networks Australia has commented briefly on each question in turn.

a. What are the least-regret generation and transmission developments which are most robust to different futures?

Energy Networks Australia supports this question. In particular, the concept that 'least-regret' generation and transmission developments should ensure that we have a resilient power system that provides a secure, reliable and low cost electricity supply. The concept is helpful in recognising the strategic nature of the ISP and the uncertainty in which planning decisions must be made, while continuing to focus on economically efficient investment.

³ Dr Alan Finkel, Independent Review into the Future Security of the National Electricity Market, June 2017, page 113.

⁴ AEMO Integrated System Plan Consultation, For the National Electricity Market, December 17, page 15.

b. Could large-scale renewable generation in targeted zones provide an efficient solution for future power system development, and what storage and transmission investment would be needed to support such an outcome?

Energy Networks Australia supports this question, subject to the modification shown below:

“Could large-scale renewable generation in targeted zones provide an efficient solution for future power system development, and what storage, transmission network, distribution network or demand-side investment would be needed to support such an outcome?”

Energy Networks Australia notes that while it is likely that REZs will be part of an efficient integrated system plan, the number and location of REZs need to be assessed according to efficiency considerations.

c. What is the optimal balance between a more interconnected NEM, which can reduce the need for local reserves and take advantage of regional diversity, thereby more efficiently sharing resources and services between regions, and a more regionally independent NEM with each region self-sufficient in system security and reliability?

Energy Networks Australia supports this question. The ISP must consider competing alternative solutions, including the balance between more regional independence and increased interconnection. It should also be noted that increased interconnection can provide additional diversity as an alternative to increased self-reliance.

d. To what extent could aggregated load shifting and price-responsive load management, made available through investment into distributed energy resources (DER), reduce the need for large-scale generation and transmission development to replace the existing generation fleet as it reaches end of life, while maintaining power system reliability and security?

Energy Networks Australia supports this question, subject to including large scale storage developments in the range of investment options. It is essential that AEMO considers the role of DER in delivering lower cost alternatives to large-scale generation and transmission solutions. Energy Networks Australia supports economically efficient investments that deliver the lowest cost outcome. While transmission upgrades will be justified on this basis, DER, supported by distribution networks or other service providers, are also likely to play an important role in delivering a reliable and secure supply.

AEMO asks a final question, which is set out below:

What is the optimal balance between the lowest-cost pathway and having the optionality to ramp up new development if required by circumstances, such as earlier than expected generator retirements, lower than expected DER uptake/orchestration, or higher than expected development of renewable generators?

Energy Networks Australia agrees that a judgment call must sometimes be made between the lowest cost solution (in terms of expected costs) and the need to manage risks associated with high impact, low probability events such as the unplanned closure of existing generation.

Energy Networks Australia doubts, however, if there is an 'optimal balance' in making these types of judgments, as implied by the above question. The preferred investment in a 'least-regret' decision framework will depend on the particular circumstances in each case and the perceived downside risks associated with different courses of action.

To avoid any confusion, Energy Networks Australia suggests rewording the above question as follows:

~~*What is the optimal balance between the lowest-cost pathway and having the optionality to ramp up new development if required by circumstances, such as*~~
What, if any, power system upgrades are warranted to address the risk of earlier than expected generator retirements, lower than expected DER uptake/orchestration, or higher than expected development of renewable generators?

With the exception of the suggested changes described above, Energy Networks Australia considers that AEMO's questions appropriately reflect the scope and purpose of the ISP. Energy Networks Australia does not propose any additional questions.

Question 2: The scenarios the modelling will use to inform the ISP are outlined in Section 1.4 of the consultation paper. Recognising the time limitations to produce the first ISP in mid-2018, are these suitable scenarios to address at a high level? Should these be expanded in more detailed analysis for future ISPs?

Energy Networks Australia supports AEMO's concept of a 'neutral' scenario combined with two 'bookend' scenarios. However, in terms of the presentation, Energy Networks Australia does not support describing the neutral scenario as 'business as usual', as shown in Table 1. As indicated in AEMO's consultation paper, the rationale for the ISP is to address the major transformation that it is occurring at both ends of the supply chain. In this context, it would be more appropriate to describe this scenario as a 'base case', rather than 'business as usual'.

Energy Networks Australia also notes that the 'bookend' scenarios would adopt the same values for the following parameters:

- » Rooftop PV capacity;
- » Battery storage installed capacity;
- » Government renewables targets;
- » Grid scale storage costs;
- » Small scale PV + distributed battery costs; and
- » Gas demand: Gas powered generation.

Energy Networks Australia notes that Chapter 2 of the consultation paper⁵ sets out some useful information on different estimates of DER uptake, drawing on AEMO's analysis, independent reports and CSIRO estimates in its work with Energy Networks Australia on the Electricity Network Transformation Roadmap. However, this information is not reflected in the scenarios.

As already noted, Energy Networks Australia supports the concept of 'bookend' scenarios, but this necessitates the adoption of upper and lower ranges for each of the inputs listed above. This is particularly important in relation to DER, where scenarios should be used to test the implications of different rates of uptake.

Energy Networks Australia does not support analysing DER uptake through the sensitivity analysis, which risks incorrectly characterising it as a disruptive technology rather than as a core contributor to lower cost energy solutions. It is appropriate, however, to consider the level of DER orchestration as a sensitivity.

While Energy Networks Australia recognises that increasing the number of inputs may increase the complexity of the modelling, the concept of 'bookend scenarios' implies that upper and lower limits should apply to each of these parameters. Energy Networks Australia considers that the 'bookend' scenarios should be revisited so that they provide an appropriate range of values for all input parameters. AEMO should also examine each scenario for overall reasonableness, having regard to the combination of input values.

In relation to renewable energy targets, it is appropriate for the current commitments made by the Queensland and Victorian Governments, through QRET and VRET respectively, be recognised in at least one scenario. While Energy Networks Australia understands that these targets may be subject to change, it is not appropriate for the scenarios to disregard the current renewable energy targets.

Energy Networks Australia notes that the description of the modelling does not make it clear on how generation closures will be considered in AEMO's analysis. Whilst generation closures are examined in Chapter 2 of the consultation paper, it is not discussed in relation to the scenarios or the sensitivity analysis. Given the importance of generation closures to the ISP and project prioritisation, it would be helpful if AEMO's modelling explained how this issue will be addressed.

⁵ Section 2.1.6, pages 22 and 23.

Energy Networks Australia also notes that the sensitivities are described as only applying to the ‘neutral’ case, rather than all three scenarios⁶:

“Sensitivities are used to assess how specific drivers could impact the Neutral outlook for generation and transmission development.”

Energy Networks Australia expects that AEMO’s intention is to apply the sensitivities to each scenario, although this is not clearly outlined in the consultation paper. It would be helpful if AEMO clarified how the sensitivities will be applied.

Energy Networks Australia does not propose any additional sensitivities to those described in the consultation paper. However, if AEMO wishes to introduce new sensitivities, or vary its scenarios as it develops its inaugural ISP or in subsequent ISPs, it should retain the flexibility to do so.

With the exception of the above observations, Energy Networks Australia supports AEMO’s modelling approach. Energy Networks Australia members will continue to work with AEMO in supporting the development of the ISP through the technical working groups established by AEMO.

⁶ AEMO Integrated System Plan Consultation, For the National Electricity Market, December 17, page 16.