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Dear Mr Turley,

Ausgrid response re 2025 IASR Scenarios Consultation Paper

Ausgrid is pleased to provide this submission to the Australian Energy Market Operator (**AEMO**) in response to its 2025 Inputs Assumptions and Scenarios Report (**IASR**) Scenarios Consultation Paper.

Ausgrid operates the electricity network that powers the homes and businesses of more than 4 million Australians living and working in an area that covers over 22,000 square kilometres from the Sydney CBD to the Upper Hunter.

Attachment A provides Ausgrid's responses to the questions in the Consultation Paper. Ausgrid supports the proposed amendments to scenario parameters in the Consultation Paper. We note several of these amendments reflect previous feedback provided by Ausgrid to Integrated System Plan (**ISP**) and IASR consultations.

We also note the suite of *Enhancing the ISP* rule changes currently under consideration by the Australian Energy Market Commission (**AEMC**). The impacts on the ISP and IASR of distribution-connected energy resources, particularly customer energy resources (**CER**), are important and must be better understood to ensure a credible ISP which reflects the least cost pathway to net zero. Likewise, the interactions between the gas and electricity systems as electrification intensifies will need to both reflect current policy and help shape its development over the years to come.

We recommend the inclusion of sensitivity modelling of a high electrification scenario (as previously featured in the 2022 ISP). We also recommend independently assessing data centre uptake in addition to CER technology uptake rates across solar, batteries, electric vehicles (**EVs**) and vehicle-to-grid (**V2G**) functionality, as the uptake of these technologies may not be correlated, but may increase hosting capacity for CER.

We note the 2024 ISP recognised the major role distribution networks will play in the energy transition and we welcome the opportunity to discuss our submission further and engage with AEMO to support the more detailed consideration of the role of distribution networks in the ISP. Please contact Daniel Sim, Manager - Demand Forecasting at dsim@ausgrid.com.au for further details.

Regards,

A handwritten signature in black ink, appearing to read "M Chandler".

Murray Chandler
Head of Network Strategy & Future Grid

Connecting communities,
empowering lives

Attachment A:

We have responded directly to the questions in the Consultation Paper below.

Question 1: Since the 2023 IASR publication, what changes (such as environment, social, policy) do you consider most impact scenario development for the 2025 IASR scenarios?

The Consultation Paper acknowledges policy developments which have occurred since the 2023 scenarios were developed, namely:

increased policy development to support emissions reduction, including renewable energy targets and emissions targets, as well as new settings that support industrial decarbonisation, gas fuel-switching, capacity development incentives, and broad support for consumer investments affecting CER, energy efficiency and vehicle emissions standards.

The scenarios proposed in the Consultation Paper also reflect developments highlighted in Ausgrid's response to the Draft ISP 2024 Consultation¹, including: the roles of emerging industrial loads such as data centres in demand forecasting; the role and potential for coordination of CER; and the impacts of increasing electrification of household and business activities.

The Consultation Paper has been released at the same time as the AEMC is considering the suite of *Enhancing the ISP* rule change proposals. Ausgrid supports the intent behind all three rule change requests submitted by the Commonwealth Minister for Climate Change and Energy on 3 June 2024.² These proposed changes would necessitate additional focus on the role that can be played by distribution networks and distribution-connected energy resources, as well as deepening the ISP's consideration of the interaction of gas and electricity supply and demand. While we recognise these rule changes are still being considered, it is appropriate for IASR planners to take steps to incorporate knowledge of these items into the IASR process so that they are fully reflected in the 2026 ISP. We also note these rule changes are consistent with the Final 2024 ISP which acknowledged the major role distribution networks will play in the energy transition, particularly in hosting CER, renewable generation and storage projects.³

Ausgrid is grateful for the ongoing opportunity to participate in the AEMO Forecasting Reference Group, which has been a constructive forum for assessing and deciding on future IASR improvements. We commend AEMO for undertaking early engagement with DNSPs to incorporate distribution network hosting capacity into future ISPs ahead of these rule changes being finalised.

Specific aspects of distribution network capability are of particular significance in ensuring that the ISP, and the IASR process, help with understanding the most cost-effective pathway for Australia to meet its energy and emissions objectives. In particular, there is scope for a more detailed assessment of battery storage costs and benefits at different scales, to better optimise the roles of transmission and distribution connected 'grid scale' storage, distribution network connected community batteries, behind-the-meter household and business batteries, and the storage embedded in EVs which may be accessed via vehicle to grid capabilities.

Increasing local grid generation and storage and plugging in more EV infrastructure directly to existing electricity assets like power poles, can lead to savings for all customers, enabling a smarter, more responsive local distribution grid. Recent modelling commissioned by the Energy Networks Association has indicated that nationally, the right policy and regulatory settings could unlock at least 5 GW of additional rooftop solar, 7 GW of additional front-of-meter generation by 2030 and 5 GW of additional distribution-connected battery storage, alongside enabling at least 4 million EVs on the road

¹ Ausgrid; *Ausgrid submission to AEMO's Draft 2024 ISP*; 16 February 2024; https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2023/draft-2024-isp-consultation/draft-submissions/ausgrid.pdf?la=en

² Ausgrid; *Ausgrid response re AEMC Consultation Paper – Enhancing the Integrated System Plan to Support the Energy Transition*; 18 July 2024; https://www.aemc.gov.au/sites/default/files/2024-07/ausgrid_submission_final_-_aemc_-_enhancing_the_isp_consultation_18_july_2024_-_signed.pdf

³ AEMO, *2024 Integrated System Plan*, 26 June 2024, p. 8: <https://aemo.com.au/-/media/files/major-publications/isp/2024/2024-integrated-system-plan-isp.pdf?la=en>

by 2030.⁴ Optimising the use of distribution networks in this way could result in by 2030, customer savings of around \$160 a year, avoided system costs of \$7 billion, and enable Australia's 82% renewable energy target to be met without compromising electricity reliability⁵ Our own modelling indicates the scale of the distribution network opportunity may lead to even higher benefits.

As part of the 'coordination of CER' parameter, the IASR should consider a more realistic starting point for the volume and proportion of CER that is coordinated, and recognise the need to actively drive policy that can improve on this and minimise system costs, including through networks adopting a Distribution System Operator (**DSO**) model. This involves distribution networks enabling and rewarding the flexibility offered by CER by combining smart solutions such as dynamics operating envelopes with flexible network pricing. Project Edith is one example of how Ausgrid is leading with this ambition.⁶ As highlighted below, as there is a high level of uncertainty regarding the willingness of consumers to participate in coordination activities, various CER coordination levels should be tested as sensitivities.

We also consider there to be opportunities to host more renewable generation and storage at all levels of our distribution network as a way of easing the current and future requirements on transmission networks. We are doing this through joint mapping exercises with the NSW and Commonwealth Governments to assess hosting capacity on our network. We are also considering the development of distribution renewable energy zones (**DREZs**), which would enable medium scale renewable generation and storage to be connected quickly, at low cost and with limited community impact by leveraging existing capacity on our network. For example, while new transmission can cost up to \$720,000 per MW of added network capacity,⁷ DREZs can be delivered at a significantly lower cost by avoiding large augmentations of the grid in remote locations. Opportunities like DREZs should be further considered in identifying the potential trade-offs between transmission and distribution network investments.

Trends in gas consumption in the household and business sector are inherently connected to electricity demand. As a result, it is appropriate that the ISP consider gas and demand-side factors in an integrated manner, and that the IASR process facilitates this. It will be important to ensure that gas and electricity demand-side scenarios are mutually compatible and internally consistent, and that they are also aligned with other AEMO market assessments, particularly the assessments of gas demand incorporated into AEMO's annual Gas Statement of Opportunities. While developments in gas-to-electricity fuel switching may be captured in the proposed 'electrification' parameter (as well as impacting on the existing 'hydrogen use and availability' and 'renewable gas blending' parameters), explicit recognition of the need for other AEMO reports to align with these scenarios would be welcome.

Better integration of gas in the ISP process will also enable better informed assessment of potential policies to drive electrification at national and jurisdictional levels. Improving the accuracy of gas market information in the ISP will allow for better whole-of-system demand drivers to be explored and consistently compared against AEMO's multiple decarbonisation pathways. It will also improve transparency for stakeholders and Governments, who rely on these forecasts to make policy, commercial and financial decisions.

Question 2: Is AEMO's proposal as described above a suitable evolution of each scenario's parameters that will effectively support AEMO's functions in planning the transition?

AEMO proposes scenario settings across 15 parameters. Table 1 below outlines Ausgrid's specific commentary on each of the parameters and their proposed settings for inclusion in the 2025 IASR. For clarity, only the parameters where Ausgrid is providing comment are featured in the table.

⁴ Energy Networks Australia; *The Time Is Now*, 6 August 2024; <https://www.energynetworks.com.au/assets/uploads/The-Time-is-Now-Report-ENA-LEK-August-2024.pdf>

⁵ Ibid.

⁶ Project Edith is a demonstration of dynamic network pricing and dynamic operating envelopes aimed at increasing market participation of CER and efficiently rewarding customers for network support.– see <https://www.ausgrid.com.au/About-Us/Future-Grid/Project-Edith>

⁷ AEMO, *2023 Input, Assumptions and Scenarios Report – Assumptions Workbook*, 'REZ Augmentation Options' tab.

Table 1: Ausgrid comments on AEMO’s proposed scenario settings

Parameter	Progressive Change	Step Change	Green Energy Exports	Ausgrid Comment
<i>Electrification</i>	Electrification is tailored to meet existing emissions reduction commitments, with slower adoption given weaker economic circumstances	High electrification to meet emissions reduction commitments, with pace of adoption reflecting economic conditions	Higher electrification efforts to meet aggressive emissions reduction objectives, with faster pace of adoption	AEMO's proposed scenario settings for electrification activities are consistent with the outcomes within the CSIRO and Climate Works Multi-sector energy modelling 2022 report, which highlights the cost-effectiveness of electrification over other decarbonisation activities. In testing the upper bound of electrification, Ausgrid recommends the addition of a strong electrification sensitivity, as was featured in the 2022 ISP.
<i>Emerging commercial loads</i>	Emerging sectors such as data centres experience lower growth as weaker economic circumstances limit technology uptake	Emerging sectors such as data centres match opportunities associated with moderate domestic economic drivers	Emerging sectors such as data centres match opportunities associated with higher domestic economic drivers	<p>Ausgrid welcomes the inclusion of commercial loads, like data centres, as a parameter adjustment in the scenario development for the 2025 IASR. Ausgrid recommends the parameter be renamed given the extensive acceleration in data centre connection activity over many years. The “Emerging commercial loads” parameter name does not reflect an existing and established accelerating trend.</p> <p>Proposed settings are broadly appropriate, however activity in emerging commercial load connections is likely to lead to increased economic activity. For example, early adopters of data centre services can leverage this competitive advantage into further adoption of technology and digitisation, which could drive further demand for data centres irrespective of broader economic conditions. This could necessitate higher demand ramp rates from emerging commercial loads in the near term. Overall, the magnitude of long-term demand arising from emerging commercial load connections should consider future developments in this category to capture Edge data processing needs consistent with technology deployment associated with automated social systems such as smart city infrastructure.</p>

<i>Industrial Load Closures</i>	Weak economic conditions provide challenging commercial conditions, resulting in load closures across key commercial and industrial facilities	No specific load closures	No specific load closures	The 2024-25 Australian Budget allocated \$22.7 billion for the Future Made in Australia initiative which incentivises onshoring a subset of strategic manufacturing industries, with a particular focus on industries which will support the transition to net zero. Ausgrid recommends adjustment to these parameters to account for policy changes such as the Future Made in Australia policy and the extension of policies into other areas of manufacturing that have similar national strategic significance
<i>Demand side participation uptake</i>	Lower	Moderate	Higher	Ausgrid recommends similar parameter settings to the "Coordination of CER (VPP and V2G)" given the similarities relating to consumer acceptance of demand side participation activities and uncertainty regarding the willingness of consumers to participate.
<i>Consumer energy resource investments (batteries, PV and EVs)</i>	Lower	High	Higher	The level of uncertainty between CER technology types is uneven. Maturity in adoption rates differ across the three highlighted CER technologies ranging from established uptake trends for PV to slower uptake for batteries. Ausgrid recommends adopting independent parameter settings for each CER category (including V2G functionality) to acknowledge that uptake is not correlated across technology types and functionality.
<i>Coordination of CER (VPP and V2G)</i>	Low long-term coordination, with gradual acceptance of coordination	Moderate long-term coordination, with gradual acceptance of coordination	High long-term coordination, with faster acceptance of coordination	Ausgrid supports the moderation of CER coordination for the Step Change scenario given the high uncertainty regarding the willingness of consumers to participate in coordination activities. Sensitivity testing of demand outcomes to various CER coordination levels similar to the 2024 ISP is recommended.
<i>Renewable gas blending in gas distribution network</i>	Up to 10% (hydrogen), with unlimited blending opportunity for biomethane and other renewable gases	Up to 10% (hydrogen), with unlimited blending opportunity for biomethane and other renewable gases	Up to 10% (hydrogen), with unlimited blending opportunity for biomethane and other renewable gases	The limits in the scenarios of up to 10% hydrogen and unlimited biomethane/renewable gas limitations reflect the technical limitations of each natural gas substitute. However the economic viability of these gas substitutes may result in far lower hydrogen or biogas blend levels in practice.. Ausgrid recommends including economic constraints to displacing natural gas with renewable gas alternatives. The consideration of hydrogen should be consistent with other gas forecast assumptions.

<p><i>Global/domestic temperature settings and outcomes</i></p>	<p>Applies Representative Concentration Pathway (RCP) 4.5 where relevant, consistent with a global temperature rise of ~ 2.6°C by 2100</p>	<p>Applies RCP 2.6 where relevant, consistent with a global temperature rise of ~ 1.8°C by 2100</p>	<p>Applies RCP 1.9 where relevant (~ 1.5°C), consistent with a global temperature rise of ~ 1.4°C by 2100</p>	<p>Installation rates of CER within the Ausgrid network has been hitting step change levels aligned with RCP2.6. For activities that are helping to mitigate climate change (eg electrification) we support targeting RCP2.6 or below. For activities that are building resilience to climate change impacts such as storms, we support using RCP4.5 or above, as this is the most likely impact.</p>
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Question 3: What additional changes should be considered?

Ausgrid strongly supports the assessment of scenario likelihood as part of the IASR and applying it in the ISP process to identify the optimal development path. However, Ausgrid recommends the mechanism undergo periodic review to assess the effectiveness of determining scenario likelihood. In lieu of alternatives, the Delphi Technique appears on face value to have been an adequate approach in assessing scenario likelihood for the 2022 and 2024 ISP. To ensure the methodology remains fit for purpose, Ausgrid recommends a review of the Delphi Technique methodology and its intended application to the 2026 ISP.

Ausgrid recommends the continuation of the production and timely release of the IASR data book as part of the IASR process. This ensures transparency of forecast components and enables the ability to translate macro themes to lower network levels. Ausgrid has particular interest in the disaggregated data featured within the data book relating to demand profile impacts and uptake of various forecast elements. However, detail across forecast components varies, leaving some component demand impacts more opaque than others. Specifically, networks would benefit from additional detail about electrification, energy efficiency and demand side participation assumptions and inputs, so that these can be more robustly applied to modelling and forecasting when applied spatially across distribution networks.