

Australian Energy Market Operator
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Attn. Dan Collins

Re: C4NET submission to AEMO 2025 IASR Scenarios consultation

We thank the Australian Energy Market Operator (AEMO) for the opportunity to provide C4NET's consideration into the scenarios informing the 2025 Inputs, Assumptions and Scenarios Register (IASR) and subsequently the Integrated System Plan (ISP). The Centre for New Energy Technologies (C4NET) delivers multi-disciplinary solutions to the challenges the energy industry is facing. Working with complexity requires diverse skills, reliable data and new approaches, which C4NET facilitates by bringing together governments, industry and universities, creating new links across the sector.

Central to C4NET's program of work is the Enhanced System Planning (ESP) project, a significant and collaborative research project aimed at informing sub transmission level electricity planning beyond 2030, with a focus on building methodologies and approaches for bottom-up modelling and to highlight the opportunities presented through the distribution system and integrating Consumer Energy Resources (CER), to inform whole of system planning.

The methodologies developed through the ESP can inform the impact of various levels of CER/DER hosting on distribution network systems to identify constraint issues down to localised levels, and key differences across both network types (topologies) and orchestration/coordination levels. This is consistent with the Energy and Climate Change Ministerial Council's recommendations to the recent ISP review. In addition, the ESP provides a bottom-up approach to validate some of the assumptions in the ISP from a localised and technological level.

Q1 Since the 2023 IASR publication, what changes (such as environment, social, policy) do you consider most impact scenario development for the 2025 IASR scenarios?

We present some over-arching considerations for AEMO in relation to the scenarios including:

- Effective utilisation of assets at the low voltage (LV) level will be important to understand. Specifically, the value and role of localised distribution, and the benefits of an active distribution system. The scenarios are currently written with distribution systems unconstrained; and we note that this will impact all three scenarios without further consideration of the limitations that LV networks will face as the transition continues, impacting planning and investment decisions. Note that we will contribute further to these insights through the ISP consultation.
- Assumptions in each scenario will need to consider energy market functions in a materially different market driven by uptake of CER. There will need to be different market arrangements for effective participation of CER, to inform where existing structures reach practicable operating limits such as when the wholesale market is dominated by supply with zero short-run marginal cost, solar export dominating network design limitations, and predicting practicable levels of CER device participation.
- The effective hosting capacity of the LV grid will require a more nuanced view of what is in the system and what is utilised for coordination. This will require additional analysis of how the LV grid will evolve with changing population trends and changes to housing type (eg low/medium density to high density) and the increasing occurrence of constraints contributing to wastage.

Q2 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?

- We support AEMO's proposal in relation to the evolution of each scenario's parameters, with the following considerations.
 - Parameter 'Consumer energy resource investments (batteries, PV and EVs)' - the *Progressive* and possibly the *Step Change* scenarios will need additional consideration of the 'weaker economic circumstances' as the scenarios are contingent on the uptake and investment by households, which will likely slow with increased economic pressures and may further impact timelines.
 - Parameter 'Coordination of CER (VPP and V2G)' - the use of 'acceptance' could be considered further through the inclusion and understanding of the evolving nature of the connections agreement at the distribution/network level. Regulations and standards are influencing the likely operation of CER assets which are incorporated into the connections agreement, for example the dynamic operating envelope. Consumers have a choice at this time, but acceptance is not necessary. This is likely to be a factor in the electric vehicle smart chargers, which will infer acceptance at purchase and installation, but use should not be contingent on acceptance. Consider reframing for the term 'choice', alternately 'acceptance' will likely be more relevant for coordination of CER initiated through commercial contract arrangements, such as Virtual Power Plants.

Q3 What additional changes should be considered?

- A parameter that recognises the importance of investment at the distribution network level (in addition to customer CER investment) could be considered in future IASRs. This would provide important recognition that CER investment connects to the distribution network and this creates a need to invest in approaches to integrate CER assets more actively (facilitating coordination) and expand the capacity of the network. If applied nationally, ESP methodologies have the potential to inform the estimation of a distribution network investment parameter.

We look forward to engaging in AEMO's consultations for the Electricity Demand Forecasting Methodology, the ISP Methodology and the broader Draft 2025 IASR throughout 2024-25 as we continue to refine the outputs of the ESP resulting in methodologies and approaches that will further enhance the ISP.

Yours sincerely,



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Centre for New Energy Technologies