



570 George Street
Sydney NSW 2000
All mail to GPO Box 4009
Sydney NSW 2001
T +61 2 131 365
www.ausgrid.com.au

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Dr Stuart Johnston
Energy Networks Australia
Level 1, 110 Giles Street
Kingston, ACT, 2604
Australia

Dear Stuart,

Thank you for the opportunity to provide feedback on the Open Energy Networks Consultation Paper.

Ausgrid's overriding objective in reviewing and commenting on the paper's options for a model to integrate distributed energy resources (DER) was what will provide customers with access to *the most cost-effective energy supply solution that also meets their non-financial requirements* (e.g. reliability & security, sustainability, safety, choice & control, and fairness).

In the context of this overriding objective, Ausgrid has identified three critical success factors:

1. Maintain a clear **distinction between system and market operations**, recognising that these represent distinct functions, technologies, skills, capabilities, risks, and obligations, and do not have to be provided by a single entity.
2. Use the **lowest cost operating model** to deliver each function within the overall solution, i.e. use market based solutions where they provide the lowest cost option, and monopoly based solutions where fixed costs are high and shared resource synergies can deliver a lower cost solution than a competitive market.
3. Pursue an **incremental approach**, maximising the opportunity to innovate, test, learn and refine – allowing the identification of the most beneficial model(s) for society as a whole, and minimising risks associated with large scale implementations that may not deliver commensurate consumer benefits

We expand on each of these critical success factors below.

1. Distinction between 'system' and 'market' functions

Ausgrid notes the many and varied definitions of what a Distribution System Operator (DSO) is and the potential for confusion and misunderstanding this can engender. The paper's focus on the functions required to increase network hosting capacity and integrate DER into the network rather than who should take the role of a 'DSO' is a logical and positive step toward industry wide understanding and agreement.

There is broad and valuable discussion of both the challenges DER poses for distribution but also the range of emerging services it could provide. Much of the paper's option development focus however is on the operation of markets for wholesale DER. Ausgrid is of the view that the three options described (single integrated platform, two step tiered regulated platforms, and independent DSO) would benefit from:

- Greater distinction between *market operation* functions – those needed to run transparent and competitive markets for DER services, and *system operation* functions – those needed to manage the localised use of DER to network safety and reliability requirements, and
- Which DER services, *established* – wholesale and FCAS, or *emerging* – e.g. voltage control, are proposed to be delivered as part of the options and by whom.

Ausgrid supports the broader integration of services for the dispatch or control of DER, such as network demand management for network support services or demand response, into competitive market platforms, where the platform can support them. This has potential efficiency benefits for both DNSPs and providers/aggregators of DER services.

2. Lowest cost operating model

In order to provide customers with access to the most cost-effective energy supply solution that meets their non-financial requirements, each element of the solution must be delivered by the most efficient operating model. Ausgrid is currently agnostic to whether market operation services are provided by one or many operators in each jurisdiction, providing that the selection of a preferred model includes clear demonstration that it is the most cost effective solution available without compromising the non-financial objectives of all customers connected to the distribution network.

Ausgrid is of the view that the most efficient and cost effective model for system operation continues to sit with the distribution network service providers. The key factors which form our view in this regard are:

- The fundamental responsibility and accountability for safety and reliability of the network lies with the DNSP – under both normal and emergency situations. No other entity will have a greater incentive to ensure the safety and reliability of distribution networks for the millions of small customers connected directly to these networks with and without DER.
- The optimum operation of the distribution system includes not only the dispatch of DER, but the switching of the network (manual or automatic), the management of other controlled load systems (e.g. hot water storage), and the scheduling of maintenance, replacement,

augmentation and connections work. An effective DSO needs a thorough understanding of all of these factors and their interrelated performance impacts to adequately operate the system.

- The technology, skills and capability for system operation at the distribution level are highly developed within each of the DNSPs across the NEM. Enhancements in capability to gain visibility of DER location and status, and extend the ability to forecast, measure and respond to constraints on the network, whether they be caused by normal operational factors or DER, represent incremental changes to today's Advanced Distribution Management Systems (AMDS) and associated system control resources. ADMS systems have been, or are being, rolled out across most NEM DNSPs. As existing capabilities will need to be retained by DNSPs to enable them to continue to meet their reliability and safety obligations, replication of these capabilities within the operating processes of a 3rd party rather than building on those already existing would lead to duplicate cost and undue complexity.

3. Incremental approach

There is a wide variation in network conditions across jurisdictions and the need for proactive management of DER integration is a pressing issue in some, but not all. This provides an opportunity to trial and learn from a range of models that can be tested in appropriate jurisdictions and relevant locations. Lessons learned from trials can shape the final model(s) and implementation approach. Shared trial cost benefit results can assist in determining where, when and how the introduction of DSO functionality is economically beneficial to customers, commensurate with the adoption of DER in each area.

Ausgrid encourages a gradual approach to developing and testing alternative system and market operation concepts, and to avoid investment in a broader roll-out, or any attempt to create a 'common' platform before the benefits are a) understood, and b) available and achievable in all areas sufficient to justify the investment. The objective of having a common platform between network jurisdictions or states is a worthy long term ambition, but by no means is this a necessary requirement in the near term, and any attempt to seek commonality too early would very likely inhibit innovation.

To retain the long-term potential for a common platform, maximise the industry wide benefit of investments in trials, encourage competition amongst technology providers, and avoid duplicating cost, Ausgrid supports the adoption of industry-wide information exchange standards.

Potential model for consideration

Ausgrid supports the development of options that build upon the experience and understanding of electricity market operations gained across the NEM at the transmission level. We note that in applying lessons learned from national transmission to the distribution level that the key differences between the two are the number of assets, connection points and DER, and the complexity of systems and management that is required to be effective.

The following provides some contextual information on the scope and scale of operations within the Ausgrid distribution network.

- 1,550,000 residential customers

- 180,000 business customers
- 120,000 solar photovoltaic systems
- 500,000 controlled load customers
- 180 zones
- 2,200 high voltage feeders
- 30,000 distribution substations
- 60,000 low voltage distributors
- 8,500 unplanned outages per year
- 4,000 planned outages per year
- 24,000 network switching operations per year (20% unplanned)

Under different operational circumstances the system operator may require curtailment of the DER feeding into the network, for example during one of the many thousands of planned and unplanned outages that occur each year. Equally, system operators may require all DER in an area online just prior to network re-energisation to moderate ramp-up. Similarly the system operator may need to understand the capacity and status of DER in a given location to inform near real time load flow modelling such that optimal network configurations can be found when isolating faults during an emergency. In all of the above scenarios it would be difficult for a 3rd party (relying on market mechanisms or otherwise) to achieve these outcomes, given the dynamic, real-time and unpredictable nature of changes that occur when operating an LV network.

Taking account of the multiple orders of magnitude differences in number and type of network operations, the nature of system operator requirements above, and the critical success factors outlined above, Ausgrid encourages the consideration of a model which separates the distinct roles of both the *system operator* and the *market operator*, with:

- The gradual introduction of DSO functionality in line with DER proliferation in each jurisdiction to encourage and maximise learnings from innovation, and ensure benefits to customers exceeds cost;
- The DNSP maintains responsibility for the day to day operations of the system including management of system operating envelopes and control (directly or through an aggregator) over DER where safety or reliability is at risk; and
- A market operator managing an expanded DER market platform (which considers both wholesale, network and other energy services), with the freedom to coordinate, control and despatch DER in all scenarios where system operating envelopes are maintained, and safety and reliability are not jeopardised.

Ausgrid looks forward to continuing to work with AEMO, the ENA and industry as we adapt to changing technologies and deliver outcomes that are in the best long term interest of all network customers.

Yours sincerely

A handwritten signature in black ink, appearing to be 'R. Lewis', with a long horizontal line extending to the right.

Rob Amphlett Lewis
Executive General Manager, Strategy & Regulation