21 January 2020

Mr Arek Gulbenkoglu
A/General Manager, Distribution
Australian Energy Regulator

Uploaded via email: AERinquiry@aer.gov.au

Dear Mr Gulbenkoglu

SA Power Networks submission on assessing DER integration expenditure

SA Power Networks welcomes the opportunity to comment on the AER Consultation Paper on assessing Distributed Energy Resources (**DER**) integration expenditure proposed by electricity distribution network service providers (**distributors**). This is an important subject, pertinent to the future of all networks, particularly ours, and we are pleased to provide our perspectives and experiences, noting that:

- South Australia is at the national forefront with respect to the use of DER by customers and industry, with one in three residential customers now owning solar generation, the market for battery storage accelerating and new models for energy use such as Virtual Power Plants increasing; and

- SA Power Networks has recently proposed and had reviewed by the AER, a significant initiative as part of our regulatory proposal for the 2020-25 period, by which to manage our distribution network in response to the high penetration of DER on our network. This expenditure proposal drew on complex engineering and economic analysis, and extensive engagement with customers, industry participants, other networks, policy makers and market bodies including the AER.[1]

We support the AER providing greater certainty on how distributors' expenditure proposals will be assessed. Regulatory assessment approaches need to be flexible given the pace of technology change and given that the issues presented by DER and solutions to their management will also evolve. Our submission focusses on the following key issues:

- the form of the guidance paper–assessment approaches should be flexible and customised to the specific expenditure driver being considered;

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1 SAPN, 2020-25 Regulatory Proposal, *Supporting Document 5.18: LV Management Business Case*, 25 January 2019.

- identifying customer benefits–there is opportunity for the AER to provide greater clarity and standardisation in approaches, potentially via a DER equivalent to the Value of Customer Reliability;

- treatment of network augmentation cases–the AER's expectations should be clarified with respect to expenditure proposals seeking to augment the capacity of networks to accommodate more DER; and

- other issues–we respond to more specific queries and issues raised in the consultation paper.

Form of guidance paper

There should be sufficient flexibility for expenditure proposals to be customised to the specific drivers for these expenditures. The overall approach to a proposal should depend on the nature of the expenditure driver and this will vary over time and between distributors:

- While the consultation paper refers to DER integration singularly, there will likely be distinct drivers for, and categories of, DER integration expenditure. Potential examples (there may be others) that may be relevant individually or in combination, depending on the circumstances and existing capabilities of each distributor, include expenditures to:

    - Cover administrative costs such as those involved in processing DER connection requests, and advising and communicating with customers on connection enquiries;
    - Establish foundational or new capabilities such as those to improve distribution network visibility of DER and understand a network's hosting capacity and manage its existing capacity;
    - Maintain and replace these capabilities and services over time;
    - Augment the distribution network to increase the overall capacity of the network to host more DER, by upgrading assets or enhancing operational systems such as voltage management systems; and
    - Procure third-party services ('non-network solutions') to assist with DER integration.

- The information to provide in support of expenditures, and the test to apply to determine their prudency and efficiency will depend on the specific driver. This includes: deciding whether a business case or other information metric is appropriate, which business cases should be justified on the basis of positive net benefits as opposed to least cost, the choice of credible options to address the driver, and the relevant counterfactual scenario to these credible options.

- It may be prudent for the AER to develop an approach mirroring its ICT expenditure assessment guidance paper, by developing a broad list of potential drivers for DER integration expenditures and outlining how information requirements and assessment tools may vary depending on the driver. The ICT paper distinguished between expenditures to: establish new capabilities / derive new benefits to the market / customers, replace and maintain these capabilities over time, or respond to regulatory obligations or requirements. Any list of expenditure drivers would need to be sufficiently broad so as to not stifle innovation in this rapidly evolving area.

A challenge to developing a guidance paper at this time is that any guidance, particularly if undertaken in a prescriptive manner, may be made redundant if there are changes to the regulatory framework over the next few years. This is noting that:

- The current regulatory framework guides the options available to distributors by which to manage networks in response to the issues presented by DER. Key features of the current framework relevant to DER integration include the following: distributors are required to connect DER under an 'open access' connection framework; small customers owning DER cannot be charged for network augmentation costs, and distributors cannot charge a network tariff for energy exported to the grid.

- Any guidance paper must be framed in the context of this current regulatory framework. For example, these features of the current framework imply that DER integration expenditures should be recovered across all of a distributor's customers and therefore expenditures such as for managing existing network capacity or augmenting the capacity of the network need to be justified on the basis of costs and benefits to all customers / the market rather than individuals. It is unclear why the AER's consultation paper refers to charging individual customers augmentation costs (as an alternative to limiting exports). In our reading of the NER, this approach is not legally permissible for small customers.

- The AEMC in its Economic Regulation Framework Review signalled that in 2020 it will conduct a broad review of DER connection, access pricing and energy export pricing arrangements.[2] Ahead of its formal review and any rule changes, work exploring these issues is currently progressing via the Distributed Energy Integration Program (DEIP).[3] Any change to the regulatory framework would significantly affect how expenditure proposals should be framed and the assessment tools to apply.

Key issues warranting further guidance

While over-prescription should be avoided, some issues unique to DER warrant specific consideration. There are some ambiguities and challenges resulting from key aspects of the National Electricity Law (NEL) and National Electricity Rules (NER) having been drafted when DER was not a material consideration.

Identifying and valuing benefits to customers

As outlined, the current regulatory framework guides DER integration expenditures proposed by distributors to be evaluated on the basis of costs and benefits to all customers / the market. These evaluations are challenging and costly to undertake in a manner expected by the AER. Greater standardisation in approach would assist networks and the AER, and allow stakeholders to more readily understand expected benefits to customers and the market arising from distributor proposals. This is noting the following:

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2 AEMC, *Economic Regulatory Framework Review–Integrating Distributed Energy Resources for the grid of the future*, 26 September 2019.

3 Under the DEIP, a 'DER access and pricing working group' has been convened to undertake preliminary consultation on these issues. The group comprises energy market bodies, networks, other industry participants and subject matter experts.

- The categories of market benefits listed in the NER and the AER's Application Guidelines for the Regulatory Investment Test for Distribution (RIT-D) do provide a useful starting point for examining impacts across a distributor's customer base. However:

  - The RIT-D Application Guidelines were initially drafted prior to DER being a material consideration, and the categories of applicable market benefits identified by the AER were not framed with DER in mind. Further, in its 2018 amendments to the RIT-D Application Guidelines, the AER stopped short of formally listing additional categories of market benefit which we saw as relevant to DER (and which are included in the RIT-T). Instead, the AER acknowledged that it would accept these other market benefit categories pending an application from a RIT-D proponent.[4] This approach may not be conducive to providing certainty as to how benefits should be valued.
  - The market benefit categories relevant to DER are difficult to quantify, requiring significant resources to be employed by each distributor, including via procurement of specialist consultants. In support of our 'Low Voltage Management Business Case' in our regulatory proposal for 2020-25, we focussed on quantifying only one of these potential categories of market benefit, being *'changes in fuel consumption arising from different patterns of generation dispatch'*. However, we qualitatively identified that other benefit categories such as those pertaining to ancillary services costs and competition would also be relevant but were too complex to quantify.
  - The RIT market benefit categories may also insufficiently capture all the potential benefits that DER can provide to the electricity market, particularly benefits that pertain to customers' access to markets and network support services etc–potential benefits which the AER identified in its consultation paper, and which we also qualitatively identified in our regulatory proposal.

- Given the difficulty of quantifying all potentially applicable benefits, the AER's guidance paper could seek to indicate that qualitative description of these benefits will be acceptable and that not all expenditure proposals would need to strictly fit a quantitative Net Present Value assessment approach.

- An alternative could be for the AER to develop a more standardised method for calculating market benefits arising from DER to avoid calculations needing to be entirely reproduced for each proposal from each NEM distributor. In our submissions to other AER and AEMC regulatory reviews we have suggested the AER could consider developing an equivalent to the Value of Customer Reliability but with respect to DER, a Value of Customer Export (VCE).[5]

- Consideration would also need to be given to whether a VCE should be approached from a financial market benefit perspective (e.g. impacts on fuel consumption in the NEM etc) or from a DER energy export reliability perspective. For example, just as the VCR seeks to capture tangible and intangible aspects of reliability expectations of customers with respect to energy consumption, so too might a VCE reflect these expectations with the use of networks to export energy.

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4 These categories include: 'changes in fuel consumption arising through different patterns of generation dispatch'; 'changes in ancillary services costs'; and 'competition benefits'. AER, *Application Guidelines–Regulatory investment test for distribution*, December 2018, p.33.

5 SAPN, *Submission to AER review of the Values of Customer Reliability*, 19 November 2018, p.3.

- The AER could also clarify the role it sees more broadly for research seeking to directly reflect the customers' views on the role that the distribution network should play in facilitating the connection and use of DER. In our 'LV management business case', we accompanied our more formal economic assessment of customer benefits (under the NER) with extensive consultation with end-customers and customer advocates, including a survey to directly sound the views of South Australian customers on options for managing DER on the network. This research revealed strong support for some level of network investment to enable DER exports, consistent across all demographics.[6] Regard should also be afforded in AER assessments to these more direct approaches of sounding customer preferences.

Treatment of proposed network capacity augmentations

The expenditure objectives in the NER guide how expenditure drivers / 'identified needs' should be framed and therefore the evidence that should be provided in a proposal. However, these objectives have a clearer meaning for some proposals over others. For example:

- The NER expenditure objectives refer to maintaining service performance including quality of supply (these requirements link in turn to other technical regulations). Therefore, a proposal aiming to avoid a deterioration in quality of supply by innovatively managing the existing capacity of the distribution network may need to consider a counterfactual of using a Business As Usual (BAU) approach to maintaining quality of supply. This was the initial context to our proposed 'LV management business case'–we sought to avoid DER overloading network capacity and affecting service performance, and the counterfactual considered was our current approach of using fixed export limits. We also showed that relative to the counterfactual (and other options), the chosen open had a greater net market benefit.

- The situation is more ambiguous with respect to proposals seeking to augment the capacity of a network to host more DER. That is, whether augmenting capacity links to a regulatory requirement, if it must soley be justified on the grounds of positive net benefits, or some combination of the two. The AER guidance paper could seek to clarify expectations for these cases, noting that:

    - The NER expenditure objectives also refer to managing the demand for Standard Control Services, and providing customers with access to the distribution network to connect DER is one such service. Further, the NEL appears to prohibit consumers being denied access to the distribution network for the purpose of exporting energy from DER. It is somewhat unclear what amount of access (in terms of export capability) would be interpreted as comprising a regulatory requirement. If some amount of export access was interpreted as a regulatory requirement, then the BAU counterfactual may need to include network capacity augmentation.

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6 Newgate Research, *Community attitudes towards potential solar infrastructure investment*, research report, December 2018

- If there is no requirement to provide an amount of export capability, then network capacity augmentation expenditures would presumably need to be justified on the basis of net benefits to all customers / the market. The counterfactual may likely be one with no augmentation and which outlines the lost benefit that would result from limiting export volumes the network can no longer host. Further, we would also expect that this kind of assessment would be undertaken over a suitable forecast period, aggregating all network augmentation costs and all benefits–as market benefits are shared by all customers, so too should costs of the shared network.

Other issues

Our views on other more specific issues raised in the AER's consultation paper are set out below.
Information / evidence of service performance impacts:

- It is reasonable that distributors appropriately identify and evidence impacts of DER on service provision, framed in regard to the NER expenditure objectives. Specifically, this may include:
  - with regard to the demand for Standard Control Services–data on historic and forecast DER uptake rates, surveys of customer preferences / sentiments etc (as discussed earlier); and
  - with regard to the impact on service performance (including quality and security of supply)–data on increasing customer complaints correlated with increasing DER penetration; technical evidence such as increasing detected voltage excursions or more subtle technical impacts on security of supply (e.g. analysis that indicate risks that inverter response during fault conditions can cause instability even if this has not been observed).

- However, expectations must be reasonable. Not all distributors have the same access to data. Smart metering is not ubiquitous outside of Victoria, and not all distributors have legacy investments in network monitoring devices. In our view it is a somewhat perverse situation to have to justify the prudency and efficiency of spending money to obtain network information (including from smart meter data providers), when this information is required to predict and better manage a distribution network's existing hosting capacity. Our views are that:
  - in its upcoming review of metering contestability, the AEMC should consider if distributors paying to purchase basic quality of supply data (e.g. daily voltage profiles, not real time) from Metering Coordinators / Data Providers is efficient or in customers' long term interests when this data could be provided as part of the standard metering service at almost no marginal cost[7]; or otherwise
  - the AER could apply a more streamlined assessment approach specifically to the costs of obtaining network quality of supply data.

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7 Including basic data, e.g. a daily voltage profile, in the standard data set that metering coordinators (MCs) are required to provide would not preclude commercial arrangements for networks to procure access to other value-added data services, e.g. more real-time data, which could offer additional benefits for networks but have marginal costs for MCs to provide.

Net benefit assessments

The broad expectations set out in the consultation paper appear reasonable. Specifically, we consider:

- While, as discussed, assessments should be customised to the nature of the expenditure driver, it is generally reasonable to expect that distributors should identify the driver or 'identified need', credible options by which to address the need, and a counterfactual to these credible options. Credible options should include network options, non-network options, or combinations, as outlined in the consultation paper.

- Distributors should demonstrate consideration to any reasonable potential for proposed investments to result in obsolescence and any optionality benefits associated with particular solutions.

- With regard to cases seeking to obtain data for improved network visibility of DER, a technical assessment should be provided as to the nature of the data that a distributor requires. This includes, outlining the extent to which, in their specific circumstances, this can be achieved through third-party smart meter data, other third-party data, network-side monitoring devices or some combination.

- Distributors should demonstrate that they had regard to measures outside of their control including tariff reform,[8] energy efficiency, or government initiatives, which are reasonably likely to have an effect on the distributor's forecasts of the impact of DER on service performance. This might be by way of scenario or sensitivity analyses.

- We agree that it is generally desirable for distributors and industry to work together to advance common standards whenever possible, and this has been a strong continuing focus of the extensive engagement efforts that SA Power Networks has been undertaking.[9] Where distributor specific variations are required, distributors should show evidence of appropriate engagement with industry, other networks and consumer representatives to ensure that these are justified and do not drive undue cost or complexity (i.e. rail gauge problems).

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[8] While distributors are responsible for developing distribution network tariffs via the Tariff Structure Statement, the extent to which customers actually face these tariff signals will depend on retailers and

[9] SA Power Networks' engagement with customers and industry includes:
- engagement via several working groups that we established, including our Renewables Reference Group, Customer Consultative Panel and DER Integration Working Group;
- engagement with all distributors via the biannual distributor Future Network Forum;
- sharing of knowledge / our trials, in particular our current ARENA funded advanced VPP Grid Integration project piloting flexible export limits with Tesla's SA VPP, and the DER API Working Group progressing common standards in this area.
- being active participants in the broader public discourse around managing the transition to a high DER energy system in Australia, including recent reviews by the AEMC and the AEMO/ENA Open Energy Networks consultation process, and we have aligned our proposed approach with these broader industry directions.
- contributing to the DER Access and Pricing Review under the ARENA DEIP program being led by ACOSS, TEC, and the AEMC.

We would be pleased to engage further with the AER on any aspect raised in our submission or any other matter relevant to this review. If you wish to discuss our submission further, please contact Bruno Coelho on [redacted].

Yours sincerely

[redacted]

Patrick Makinson
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