



31 August 2021

Kris Funston  
Executive General Manager, Network Regulation  
Australian Energy Regulator  
GPO Box 520  
Melbourne VIC 3001  
By email: AERinquiry@aer.gov.au

Dear Mr Funston

**RE: AER Draft Distributed Energy Resources (DER) Integration Expenditure – Guidance Note**

CitiPower, Powercor and United Energy welcome the opportunity to respond to the Australian Energy Regulator's (AER) draft guidance note on assessing distributed energy resources (DER) integration expenditure.

We support the AER's objective to provide distributors with more guidance on how it will assess DER driven investment. We agree with the AER that distributors should present a transparent and coherent DER integration strategy—we recognise that inter-relationships exist between network investment and non-network alternatives and that these should be considered holistically.

However, we consider the AER's DER integration expenditure guidance note could be improved by:

- accounting for customer values and broader environmental benefits in the benefits case
- better recognising that DER constraints are driven by localised capacity and voltage issues
- ensuring Victorian customers are not unfairly penalised due to a higher evidence threshold than other jurisdictions.

We expand on these suggestions below and respond to the AER's questions in the accompanying appendix.

Should you have any queries about this letter please do not hesitate to contact Rachel Perlaki on [REDACTED] or [REDACTED].

Yours sincerely,

[REDACTED]

Renate Vogt

GM Regulation  
**CitiPower, Powercor and United Energy**

## Customer values and environmental benefits should be understood and accounted for

Customer preferences should be at the forefront of any regulatory framework and supported by an outcomes focused regime.

By accommodating customer purchase decisions, we are facilitating their choice and allowing them to realise much of the value they expected when making the purchase. This is important for solar customers today and will become more-so under an export charge framework. The inevitable growth (and customer expectations) of electric vehicles, batteries and other DER investments reiterates the need for outcomes focused investment—it is not acceptable for networks to be a barrier to the way customers want to use new technologies.

The AER, therefore, should be encouraging the robust valuation of customer values and preferences to support evidence-based investments, rather than seeking to limit the scope of customer benefits.

### **We are currently undertaking research to better understand what our customers value**

We are in the process of carrying out research to quantify the value our customers place on a range of services we provide, to garner a better understanding of our customers' values and preferences, and to aid our decision making to deliver better services.

Understanding and recognising how different types of customers value the services we provide today, or may provide in the future, is important to better understand the competing tensions of delivery and affordability and help us shape the future of the services we provide. This will allow us to create a holistic picture of our customers values and preferences including the value of energy choice, shared energy, digitisation, and environment, informing customers' key priorities.

Importantly, the project will seek to place a monetary value on how our customer's value these services.

As the only provider of distribution services to customers in our area, we must be a facilitator and not a barrier to customer trends, particularly when those trends provide benefits to all customers. We need to accommodate customers' choices in the same way businesses operating in competitive markets must adapt.

Intangible benefits may be hard to measure but that does not mean they, and therefore the expectations that customers held when investing in DER, should be discounted altogether. Whilst many customers primarily invest in DER for financial reasons, as foreshadowed in the guidance note, customers purchase solar panels and batteries for many reasons in addition to saving money. Concluding that intangible benefits should not be factored into a benefits calculation because there is an unproved assumption that the value of intangible benefits is small does not promote customer empowerment and may lead to an undervaluation of customer choice and inefficient investment outcomes.

With respect to environmental benefits, rooftop solar and other DER initiatives are integral to transitioning to a low carbon future. Tackling climate change and providing a cleaner future are key aims of State and Federal government policies, instruments, and initiatives.

The capital expenditure factors in the Rules require the AER to have regard to the extent to which the capital expenditure forecast includes expenditure to address the concerns of distribution service end users as identified by the Distribution Network Service Provider in the course of its engagement with distribution service end users or groups representing them.<sup>1</sup>

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<sup>1</sup> NER, clause 6.5.7(e)(5A).

We are concerned, therefore, that the AER's proposed approach to valuing environmental benefits provides no role for customer engagement. In fact, it appears the AER is setting a very high threshold for environmental benefits to be assigned value - that is, any valuation must be linked directly to an avoided tax payment, or a jurisdictional direction.

Notably, Energy Consumers Australia research found that an overwhelming number of consumers across all life stages were concerned about the damage being done to the environment and climate change was top-of-mind as part of this discussion.<sup>2</sup> These consumers stated that renewables were the future and wanted Australia to be a country that moved towards a smaller carbon footprint. They also found that achieving self-reliance and independence from the grid through self-sufficiency of renewable energy like solar was important to some customers.

We consider that a more balanced approach is that where customers can be shown to value environment benefits, and this value can be robustly quantified, the AER should accept these benefits.

Moreover, if the intent of regulation is to replicate a competitive market, it is clear that private businesses in many industries are taking strong steps to reduce their environmental impacts. This is particularly relevant given the relative emissions intensity of the energy sector.

## **DER constraints are driven by localised capacity and voltage issues**

We were pleased to see the positive consideration of our solar enablement business case in the AER's guideline. We considered the development of our forecast method was leading the industry.

The use of AMI data was particularly important as it allowed us to better understand the impact of spatial constraints. This recognises that DER constraints are driven by localised voltage and capacity issues.

The importance of localised capacity issues raises questions about the AER's stated preference for assumptions and forecasts to be from an independent source, and that AEMO should be used as a starting point. For example, our AMI data is not independent but is critical and robust, and we consider spatial demand forecasts at the LV level are most relevant.

We also note that AEMO have stated that its demand forecasts should only be used for a narrow range of applications, not including reset forecasts. Furthermore, AEMO highlighted how their higher-level focus is not suitable when looking at climate change adjustments for energy consumption and extreme demand, specifically recommending that distributors consider undertaking more specialised research for the impacts at distribution levels.<sup>3</sup>

## **Maximising the value from our AMI network**

We agree that there should not be prescription on how distributors should assess hosting capacity. We also agree it is reasonable that network forecasts take account of any advanced technologies available (such as AMI data) and leverage off past investments (such as our Dynamic Voltage Management System (DVMS)).

Smart meters are vital for the integration of DER, and an efficient facilitation of a two-sided market, a key feature of the post-2025 NEM design. Smart meters are the necessary tool for customers to participate in markets but additionally provide visibility of the LV network that is crucial for understanding localised network constraints. We are in a unique position to understand the voltage impact of DER given the investment made into smart meters.

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<sup>2</sup> ECA, *A Future Energy Vision: Consumer Expectations Research*, February 2020.

<sup>3</sup> AEMO, *Forecasting Approach - Electricity Demand Forecasting Methodology*, May 2021.

As DER penetration grows, and behind the meter systems become more sophisticated, smart meter data will continue to be crucial in facilitating efficient dynamic solutions and eventually dynamic pricing.

Our DVMS allows us to remotely and dynamically adjust voltages at zone substations in response to changes in voltage levels, meaning we can lower voltages at peak solar times and then increase them again later. This has proved to be a successful tool in accommodating more solar, in most parts of our network at a low cost to maximise the efficient use of existing network assets.

Naturally, the capability of these technologies to facilitate increased solar will diminish. It is important that the AER recognises these limitations and does not set an unreasonable expectation with respect to our modelling or forecasting capabilities (noting, for example, our comparatively lower experience to date with EV and battery take-up and usage profiles). In particular, it is important that Victorian customers are not left behind or unfairly penalised with respect to investments to support DER integration relative to other jurisdictions (who will effectively be subject to a lower evidence threshold).

The AER should also exercise caution in the value placed on historical cost information, as it is not necessarily correlated with future investment needs (e.g. constraints may arise in localised areas irrespective of high or low historical expenditure, and changes driven by new DER mixes, ongoing policy change, accelerating take up rates and increased compliance obligations will have an impact beyond that reflected in recent history).

## Appendix: response to AER questions

### Question 1: Do you agree with the proposed guidance relating to how DNSPs should prepare a DER integration strategy?

We agree that networks should demonstrate that any DER integration investment is part of a coherent DER integration strategy. This acknowledges that inter-relationships exist between network investment and non-network alternatives, and we note that as part of our recent solar enablement business case, non-network and low-cost investments—such as the tapping of transformers and application of our DVMS—were explicitly preferred before transformer upgrades were considered.

It should be recognised, however, that historical cost information can not be correlated with future investment needs when there are significant changes to customer energy use patterns (and so is likely to provide limited informative value as to the need for future investment). For example, investment needs for DER integration are driven primarily by DER uptake and spatial thermal and voltage considerations. These constraints may arise in localised areas irrespective of whether high or low historical expenditure has been undertaken. Changes driven by new DER mixes, ongoing policy change (such as no zero export limits), and increased compliance obligations will also have an impact beyond that reflected in recent history.

We also note the AER's acknowledgement that its output growth forecast, as currently determined, may not fully compensate for higher operating expenditure to address DER management. We support this conclusion, consistent with the reasons set out as part of our recent revenue determination:<sup>4</sup>

*Significantly, growth in distributed energy resources, which increases the number of constraints to our network solar PV 'hosting capacity', which in turn increases the number of PV inverters tripping and thus drives our solar enablement expenditure, is not a direct input into the forecasting of output growth and is not adequately reflected in any of the outputs considered when forecasting output growth. Further, the growth in distributed energy resources negatively impacts the rate of change as energy consumption and peak demand decline with growth in distributed energy resources.*

We note however that including some measure of DER in the output growth forecasts is unlikely to fully account for operating expenditure requirements to efficiently integrate DER in future. We therefore encourage the AER to remain open to assessing operating expenditure step changes additional to the output growth forecast.

### Question 2: Should the format of the business case be prescriptive? If so, how?

We agree with the AER that prescription is not necessary, as networks already face strong incentives to provide all relevant information reasonably required for the AER and stakeholders to make informed decisions (as in the absence of full and complete information, it is less likely that proposed expenditure will be supported).

Further prescription would also increase the risk of inconsistencies in the AER's respective guidelines, which now include the RIT-D guideline, replacement practice planning notes, and IT assessment guidelines.

### Question 3: Are there particular input assumptions that should be consistent for all DNSPs?

We expect that many input assumptions will be commonly applied by networks, irrespective of any guidance set out by the AER. For example, similar to the reasons why further prescription in business cases is unnecessary, networks already face very strong incentives to use common assumptions for global variables such as the regulatory cost of capital or the AER's value of customer reliability.

However, investment needs for DER integration are driven primarily by spatial thermal and voltage considerations. Consistent input assumptions, therefore, are unlikely to be relevant to the identified need.

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<sup>4</sup> Powercor, PAL RRP BUS 9.06 Other step changes, December 2020, p. 16.

In its draft guideline, the AER also stated that consistent with its RIT-D guideline, input assumptions should be transparent and from a reputable and independent source. It considered that material published by AEMO should be a starting point.

We agree that transparency is fundamental to regulatory decision making, but for the following reasons, data need not be independent to be preferred, and AEMO should not necessarily be the default starting point:

- AMI data is crucial, but is not independent
- likewise, costing information should reasonably come from internal experience (i.e. where available, efficient revealed costs for distribution transformer upgrades should be preferred)
- AEMO forecasts demand at the terminal station, whereas forecasting DER constraints is likely to be better considered with a bottom-up build from the LV level (reflecting localised capacity issues and the nature of the underlying network)
- AEMO have stated that its demand forecasts should not be used for the purpose of reset forecasts.

The AER has also indicated a preference for networks to value benefits over a 20-year time horizon. This timeframe was recently applied by the AER in its assessment of our solar enablement business case. We recognise that IT expenditure to allow integration of DER may need to be subject to a different cost/benefit time period.

We were concerned, however, that in its assessment the AER also applied a 20-year timeframe for the recovery of costs (i.e. it assumed the cost of a network upgrade would be recovered over 20-years). The application of a 20-year timeframe for cost recovery overstated the true annualised cost that customers would face by ~60% (based on the regulatory depreciation profile)—for example:

- annualised cost of a \$60,000 transformer upgrade over 20-years (assuming a discount rate of 4%) is \$4,415
- annualised cost of a \$60,000 transformer upgrade over 50-years (assuming a discount rate of 4%) is \$2,793.

Stated alternatively, the AER's approach models cost recovery over 20-years, despite the reality that the regulatory framework requires network costs to actually be recovered over 50-years. The impact of this is that otherwise efficient investments to enable more DER would not be undertaken.

#### **Question 4: In what ways could DNSPs justify their assumed export limit in the base case scenario?**

We recognise the need to reasonably justify any assumed export limits in the base case scenario, and to demonstrate how existing technologies have been used to inform the relevant business case. In our solar enablement business case, for example, we relied heavily on our AMI data and the expected performance of our DVMS.

It is important, however, that the availability of advanced technology should not be used to set evidence thresholds such that our (Victorian) customers are unreasonably disadvantaged relative to other jurisdictions. In particular, our solar enablement modelling was highly resource intensive, and our forecasting capabilities are still growing (particularly for non-solar DER).

#### **Question 5: Are there particular examples where DER adoption forecasts may vary between the base case scenario and the investment case?**

We are not immediately aware of such examples, but caution the AER about introducing prescription that would prevent such variations where they can be clearly justified.

#### **Question 6: Do you agree with the proposed criteria for undertaking hosting capacity assessments?**

As a general principle, we agree that DER penetration, network models, and access to AMI data are relevant considerations informing the expected sophistication of hosting capacity assessments. However, for the reasons

outlined previously, we caution the AER about setting evidence thresholds such that our (Victorian) customers are unreasonably disadvantaged relative to other jurisdictions.

**Question 7: Are there other examples of approaches that DNSPs could adopt to assess network hosting capacity?**

We are not aware of further examples, but encourage the AER to remain open to the development of different approaches.

**Question 8: Do you agree that the total electricity system is the appropriate system boundary for considering DER costs and benefits?**

We consider the AER's overarching principle in assessing DER integration investment should be to ensure such investments deliver value for customers. In this context, the AER should be encouraging the robust valuation of all customer benefits.

This approach is consistent with the AEMC's Access and Pricing reforms. That is, DER customers may bear the cost of DER integration expenditure, so it's important we understand how they value the service. Considering the costs borne by customers in investing in DER, but not the benefits of those investments will result in an assessment which is incomplete and lead to inefficient investment outcomes.

Moreover, restricting the costs and benefits boundary to the total electricity system has been questioned recently by the Energy Security Board (ESB) in its post 2025 market design paper—for example:<sup>5</sup>

*Governments may also value a range of benefits that are not currently captured by either ISP or RIT-T. These benefits may include boosting local economies or delivering additional employment opportunities in regional communities. These wider economic benefits could be captured in a broader market benefits test for actionable ISP projects to guide the respective contribution of taxpayers and electricity customers.*

Although the ESB comments refer to large transmission projects, we consider the logic equally applies to distribution network investments.

**Question 9: Do you agree that the methodology used to quantify wholesale market benefits should balance shorthand and longhand approaches?**

We consider the AER's guideline should not be prescriptive in the approaches to quantifying wholesale market benefits. Rather, networks should be encouraged to use fit-for-purpose methods for their given circumstances (subject to over-arching principles, similar to those set out by the AER—for example, transparency, and an economic and technical rationale).

**Question 10: Do you know of other examples of electricity market models or analysis tools that could be used by DNSPs to quantify wholesale market benefits?**

Refer to response to Q9.

**Question 11: Do you have views on the AER's initial analysis and whether this approach could be applied in practice?**

Refer to response to Q9.

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<sup>5</sup> ESB, *Post 2025 Market Design Options – A paper for consultation Part A*, p. 75

**Question 12: Do you agree with the proposed principles for quantifying wholesale market benefits? Are there other principles that we should consider?**

We agree that the principles associated with transparency, and an economic and technical rationale for wholesale market benefits are broadly reasonable.

We note, however, that realistic evidence thresholds should be considered, particularly given the relatively novel approaches and forecasting challenges associated with newer, non-solar DER technologies.

**Question 13: Do you agree with the proposed methods for quantifying network benefits?**

We broadly agree with the scope of network benefits identified by the AER in its draft guideline. It is important to recognise, however, that the scale of benefits will be heavily network and locational dependent. For example, periods of peak solar PV use may not coincide with localised peak demand.

With respect to line losses, we note the AER's expectation that these should be built into the wholesale market benefits calculation. We agree with the inherent principle that benefits should not be counted more than once. However, it is not clear that market modelling will be undertaken at a level of granularity that accounts for these benefits (particularly distribution losses), and as such, the AER's guideline should take a more principle-based approach (i.e. where losses are not factored into the wholesale market modelling, it should be open to networks to quantify them separately).

**Question 14: Do you agree with the proposed methods for quantifying environmental benefits?**

The capital expenditure factors in the Rules require the AER to have regard to the extent to which the capital expenditure forecast includes expenditure to address the concerns of distribution service end users as identified by the Distribution Network Service Provider in the course of its engagement with distribution service end users or groups representing them.<sup>6</sup>

We are concerned, therefore, that the AER's proposed approach to valuing environmental benefits provides no role for customer engagement. In fact, it appears the AER is setting a very high threshold for environmental benefits to be assigned value—that is, any valuation must be linked directly to an avoided tax payment, or a jurisdictional direction.

We consider that a more balanced approach is that where customers can be shown to value environment benefits, and this value can be robustly quantified, the AER should be open to these benefits.

Moreover, if the intent of regulation is to replicate a competitive market, it is clear that private businesses in many industries are taking strong steps to reduce their environmental impacts. This is particularly relevant given the relative emissions intensity of the energy sector.

**Question 15: Do you agree with the proposed method for quantifying changes in DER investment?**

Refer to response to Q5.

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<sup>6</sup> NER, clause 6.5.7(e)(5A).