



Ms Claire Richards
Senior Advisor
Australian Energy Market Commission
Level 6, 201 Elizabeth Street
Sydney NSW 2000

5 July 2017

Dear Ms Richards

Distribution Market Model

CitiPower and Powercor welcome the opportunity to respond to the Australian Energy Market Commission's (AEMC) Distribution Market Model draft report (**draft report**).

In this submission we have highlighted several aspects of the regulatory framework where reform could better assist distributors to adapt to market changes. In summary we consider:

- distributors will need control of Distributed Energy Resources (DER) as a last resort to ensure public safety and avoid network damage arising from network limits being breached;
- changing the connection framework to allow distributors to charge DER connection proponents for network augmentation would promote efficient investment in DER. Pricing DER impacts on voltage would also encourage more efficient investment in and use of DER; and
- cost reflective tariffs will help to ensure the efficient investment in and use of DER, however, we do not expect widespread adoption of these tariffs with the current 'opt-in' model in Victoria.

These issues are discussed in more detail below.

Optimisation function

In the future DER owners will seek to capture multiple value streams to maximise DER's value. Individuals may take it upon themselves to maximise DER value or allow aggregators to operate DER on their behalf. These parties would sell DER services to electricity market participants such as retailers and distributors.

The AEMC has termed the process by which parties maximise the value of DER the optimisation function, and believes that distributors should not undertake this role. The optimisation function described in the draft report does not include making decisions about when to use DER in lieu of network augmentation (i.e. it does not include planning and operating the network)—which distributors would continue to perform. Over the longer term, the report (in Stage 3) considers the use of DER to provide network services will be determined by network prices.

Truly cost-reflective network pricing would require dynamic network prices on each network element, of which there are thousands. This is unlikely to be attainable in the foreseeable future. In any case, price signals are unlikely to ever be able to provide a firm alternative to network augmentation because a distributor will not be able to reliably forecast how DER will be utilised. An optimisation function that does not take into account network constraints could result in the network's thermal and voltage limits being breached. Therefore, whether or not distributors perform the optimisation function, they will require

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control of DER as a 'last resort'. This control could take the form of direct control (subject to technical limitations) or the authority to direct aggregators to control DER devices in a certain way.

Without control, network limits may be breached because:

- distributors may not have been made aware of DER's location or of the contracts between buyers and sellers of DER services, meaning it would be difficult to plan for its use (although we note initiatives such as the Council of Australian Governments' battery storage register may help overcome this problem with respect to storage devices);
- under the probabilistic planning approach adopted in Victoria, distributors will account for diversity of DER exports when planning and constructing the network. However, if this diversity does not eventuate and too much DER exports or imports simultaneously, the network's capacity may be unexpectedly breached; and
- even assuming distributors have access to all DER contracts and can plan the network accordingly, DER owners or aggregators may not deliver contracted DER services in line with their contracts (perhaps, for example, due to a scheduling error).

The consequences of overloading the network or intermittent export / device charging could include:

- excessive sagging of lines and overload of equipment, potentially giving rise to fire starts if contact with vegetation occurs or loss of life if an overloaded line contacts structures, vehicles or members of the public;
- increased customer outages as areas of the low voltage network protected by fuses breach the ratings of those fuses, causing outages until the fuse is replaced;
- overload driven failure of underground cables, disconnecting sections of the network; and
- reduced asset lifetime driven by higher than recommended loading resulting in reduced supply reliability and higher network costs.

While contracts can mitigate certain risks associated with the network limits being breached, they do not obviate the need for last resort control.

For example, distributors may seek to avoid network breaches by seeking to contract for priority use of DER to support the network. However there is no guarantee that priority use will be offered by all aggregators or in all circumstances. Furthermore, distributors may not be a party to all contracts—for example a DER owner may choose to provide wholesale arbitrage opportunities and not network support services. Distributors would have no ability to ensure network limitations are not breached via contracting in these circumstances.

Another use of contracting could be to mitigate the financial impact of DER related network breaches. For example, a DER scheduling error, resulting in network damage, may require the party at fault to compensate the distributor. However, this contracting does not obviate the need for last resort control of DER as without it, public safety may still be put at risk and avoidable network damage may occur.

Connection policy and missing markets

Consumers will be encouraged to efficiently invest in DER if they face the full cost, including the network impact, of connecting DER devices and exporting electricity. Under chapter 5A of the National Electricity Rules (**NER**), and the Australian Energy Regulator's (**AER**) connection charge guideline, distributors are unable to charge micro embedded generators an augmentation charge for the cost imposed by their connection to the network.

An alternative approach, requiring a framework change, would be to allow distributors to charge an average augmentation rate to micro embedded generators. This charging arrangement is currently applied to

consumers above the AER's shared network augmentation charge threshold. If applied to DER connections, this approach would:¹

- be more cost reflective because consumers using DER for export would bear the associated network cost; and
- avoid the 'last in worst dressed' situation whereby the customer that triggers an augmentation is required to pay for it while subsequent customers benefit from it.

Missing markets

An alternative to augmentation charges, and possibly a more cost reflective method to encourage efficient investment in and operation of DER would be to price missing markets. We support pricing DER impacts on voltage, which is a significant network cost of DER. Over the short to medium term, this charge could be based on the average cost of DER on the network in respect to voltage.

Over the longer term, the charge may be based on each device's actual voltage impact. Our Advanced Metering Infrastructure network is technically able to record steady state voltage variations. Currently we record this at the customer level during targeted trials or when initiated by our customers. This practice reflects our best endeavours to assess and record the nature, location, condition and performance of our assets in a way which minimises costs to customers.

Subject to metering contestability outcomes, we will also be able to record voltage information for pricing purposes although it would require upgrades to our communications network and IT systems.

Tariffs

The AEMC has identified network tariffs as one of the market enablers to efficient investment in and use of DER. In particular, the draft report suggests the final stage of the DER evolution will involve fully dynamic and cost-reflective tariff pricing, comprised of locational and temporal components. This will allow for signals of network constraints, and enable market users to identify the benefits and costs derived from use of the network.

The Victorian Government has adopted an opt-in approach to cost reflective network tariffs.² In our experience, opt-in tariffs have a low take-up because consumers generally stay with the default option. For example, the take-up of time of use tariffs is currently around 0.3% and 0.4% of CitiPower and Powercor residential customers respectively. We therefore similarly expect low take-up of our opt-in demand tariffs, and to date, only six CitiPower and Powercor customers have adopted the demand tariff. We support a more proactive move towards cost-reflective network tariffs.

Market operation

We would envisage the future DER market potentially operating in the following way.

DER owners would be encouraged to efficiently locate DER by considering the value streams they could receive in a particular location (for example, removing a network thermal constraint). Their connection and use of DER would take into account the cost of their connection, such as the voltage impact, via an average augmentation charge rate or voltage export charge.

¹ AER, connection charge guidelines for electricity retail customers: Under chapter 5A of the National Electricity Rules Version 1.0, June 2012

² DELWP <<http://www.delwp.vic.gov.au/energy/electricity/managing-electricity-demand>>

To capture the network value stream, distributors would be likely to require DER owners / aggregators to provide distributors with priority use of DER if chosen in lieu of network augmentation. Distributors would also have last resort control of DER to ensure network and public safety.

Demand tariffs (and other cost reflective tariffs) will encourage customers to use the network more efficiently both in terms of their consumption and use of DER—for example, by providing more information on the trade-off between using or exporting electricity from DER. In this way, we believe investment in and use of DER will be more efficient than under the current framework without change.

If you have any queries on this submission, please contact Frans Jungerth on (03) 9683 2022 or fjungerth@powercor.com.au.

Yours sincerely

A handwritten signature in blue ink that reads "Brent Cleeve". The signature is written in a cursive, flowing style.

Brent Cleeve
Head of Regulation