

11 February 2021

Anna Collyer
Chair
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Dear Anna

Re: Review of the regulatory framework for metering services consultation paper - EMO0040

CitiPower, Powercor and United Energy welcome the opportunity to respond to the Australian Energy Market Commission's (AEMC) consultation paper on the review of the regulatory framework for metering services. As owners and operators of the largest advanced metering infrastructure (AMI) in Australia, we have an extensive and unique perspective on smart meter services and how their benefits can be maximised.

We consider the AMI roll out in Victoria to be a major success story. An efficient roll out of AMI meters and supporting communications and IT infrastructure was achieved in just less than four years. The use of AMI has been embedded in our daily operations and revolutionised network operations to the benefits of our customers. Further, we have delivered all the anticipated benefits associated with efficient network operations in addition to delivering benefits that were not envisaged at the time of the roll-out.

The Victorian AMI functionality provides a rich source of real-time power quality data that, coupled with the high levels of meter penetration, provides visibility of the low voltage (LV) network that is unmatched in Australia. We have used this capability on our networks to deliver (but not limited to):

- safer electricity at home, by remotely detecting stray currents and faulty neutrals
- fewer outages by enabling pre-emptive action to identify and rectify faults
- faster restoration times and automatic dispatch of crew before customers are even aware of the outage
- keeping the lights on when generation supply falls short through participation in the Australian Energy Market Operator's (AEMO) Reliability and Emergency Reserve Trader (RERT)
- opportunities for customers to participate in LV demand management
- the lowest network charges in Australia from more efficient services and network management.

The Victorian AMI will be vital for enabling an efficient integration of distributed energy resources (DER) and facilitation of the two-sided market. AMI provides us the ability to measure and accommodate the less predictable energy flows from DER and forms the foundation of future dynamic network management and pricing.

More importantly, our customers' service experience is markedly superior to those interstate. For example:

- our customers enjoy seamless same-day remote connections and disconnections, whether they own or rent the property. From 1 July 2021 they will be getting these services for free
- most of our rural customers have remotely-read smart meters and receive services no different to those in urban areas

- because we provide network and meter services at the same time, our customers interact with a single party when connecting resulting in faster completion times and cost savings. For example, our meter installation times are on average within 24 hours. This contrasts with interstate installation times have recently been re-regulated due to significant delays and still allow for up to 15 business days
- our metering charges will be significantly lower from 1 July 2021 compared to 2020 (ranging from reductions of 13% to 29%), and will continue to fall for the next decade, as we get the most out of our existing fleet long after the cost of the initial installation is paid off.

In short, the Victorian experience demonstrates:

- to get the most out of smart meters, high penetration is crucial and best achieved through a managed roll-out. Distributors are best placed to deliver an efficient and timely roll-out due to economies of scale
- customer benefits from LV network optimisation are the most significant benefit stream from smart meters. The current arrangements outside of Victoria prevent those benefits from being realised.

Given these learnings, we recommend the AEMC:

- prioritise arrangements that will lead to the most timely and efficient roll-out of smart meters. This includes re-evaluating the benefits of a regulated distributor-led roll-out
- increase the Minimum National Specification to align with the Victorian AMI Specifications.

We provide further details on the benefits of the Victorian experience in the body of the submission.

Should you have any queries about this submission please do not hesitate to contact Sonja Lekovic on (03) 9683 4784 or slekovic@powercor.com.au.

Yours sincerely,



Renate Vogt

General Manager Regulation

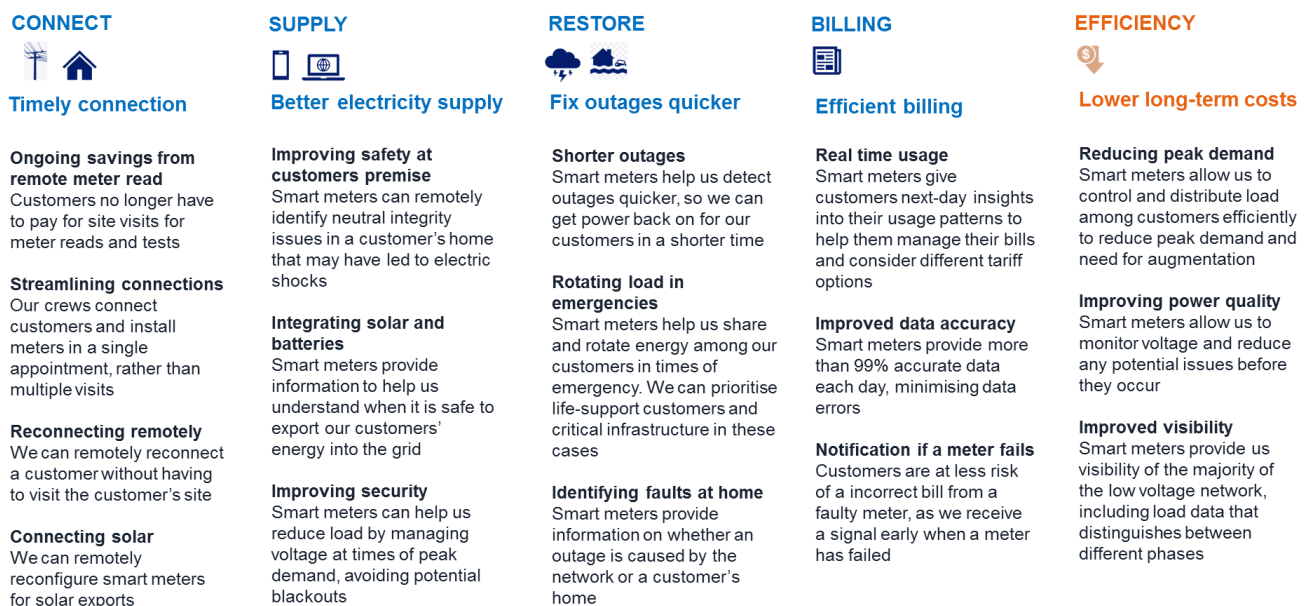
CitiPower, Powercor and United Energy

1 We are leveraging AMI to deliver customer benefits

We completed our AMI roll-out within a four year period concluding in 2014. More than 97% of our small customers have a smart meter. Since the completion of the AMI rollout, we have actively leveraged AMI functionalities to deliver benefits to customers through better management of the distribution network and more efficient use of network assets.

Figure 1 provides an overview of the customer benefits that have been enabled.

Figure 1 AMI benefits we deliver



Source: CitiPower, Powercor, United Energy

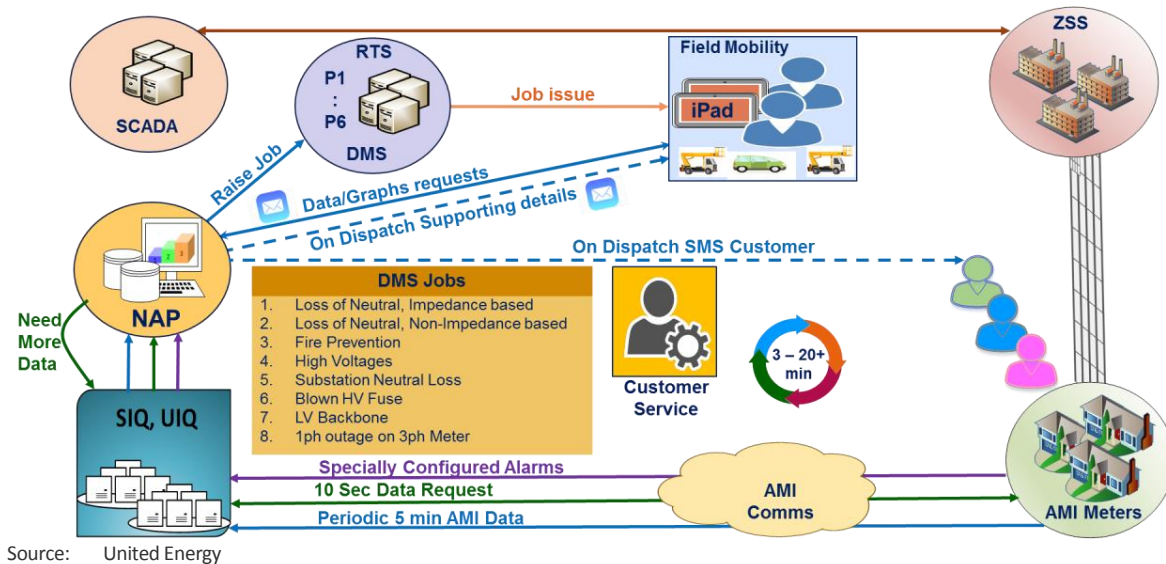
1.1 Outstanding safety and reliability benefits

1.1.1 Reducing electric shocks through remote identification of neutral integrity issues

The critical service of remote identification of neutral integrity issues at a customer premise relies on 5-minute voltage data provided by AMI. We have created a unique loss of neutral algorithm which analyses and remotely disconnects unsafe supply based on 5 minute intervals. Neutral integrity faults pose a significant safety issue through electrocution. Utilising AMI, we have reduced the number of electrical shocks by 85% since 2014.

Figure 2 illustrates how we use manage AMI to identify and manage safety risks, including neutral faults.

Figure 2 How we use AMI to identify and manage safety risks



1.1.2 Enhanced asset management

Analysis of AMI data has enabled us to enhance our service line asset management practices.

For example, prior to AMI we replaced service lines in bulk once we observed trends of rising failure rates. Using AMI data, we now detect when service lines have deteriorated. We then automatically dispatch service trucks to make repairs and, if the condition is serious enough, automatically isolate supply to make the site safe. We are also developing an algorithm for batching deteriorated service lines to enable more efficient replacement.

This approach has been extended to other network assets, including LV switches, LV circuits, fused overhead line connection boxes and distribution transformers.

1.1.3 Faster restoration of faults and improved service during outages

We have integrated the Victorian AMI last gasp services into our fault management processes. We now receive immediate notification of outages from the AMI meter, which feeds into our outage management systems and automatically schedules and dispatches field crew to restore supply

We have also developed an interactive voice response service and SMS service which automatically advises customers of outages identified through the last gasp AMI function. This has greatly improved customer satisfaction with outage notifications with satisfied customers now reaching 86%.

1.1.4 Better targeted planned outage notification

Visibility of the LV network through AMI has allowed us to develop an LV network model. An LV network model allowed more accuracy regarding the specific phases a customer is connected to. The LV network model has enabled us to ensure we notify the right customers and reduce the number of customers unnecessarily notified of planned outages. We have also been able to better prioritise life support customers.

1.2 Keeping the lights on when supply falls short

The AMI network can be used to keep the lights on for customers when generation supply falls short. For example, on 24 and 25 January 2019 through the provision of RERT services, we were able to reduce electricity demand in real time by around 100 MW. This avoided load shedding of 66,200 customers.

To participate in RERT, the control room reduces the voltage at which we supply electricity in real time by remotely controlling tap changes located at zone substations. We continuously monitor 5 minute voltage data in real time across our network at the connection point, collected from AMI, to determine the amount by which we can reduce voltages to maintain supply quality and meet our obligations under the Electricity Distribution Code. Only Victorian distributors can provide this service because:

- of the availability of 5 minute voltage data, monitored in real time across the network
- having a communications network capable of transporting large data volumes in real time.

AMI will ensure the continued provision of RERT services as vital tool to ensure load shedding in Victoria is minimised. Under a third party led AMI roll out, a RERT service could not be provided as will be discussed below.

1.3 Superior customer experience compared to interstate

There is a substantial gap in the Victorian customer experience compared to those interstate with respect to metering.

AMI allows the delivery of faster services and lower prices enabled by economies of scale. Customers with contestable meters have not had the same experience:

- all our meter installation times occur within 24 hours. We install the meter at the same time as completing a new connection. Further our field trucks carry replacement meters meaning we are always prepared to replace faulty meters. This is in contrast to installation times interstate which can take anywhere up to 15 business days
- there are synergies in completing a new connection and meter installation at the same time, or a supply isolation/restoration and a meter replacement. This contrasts with contestable provision where there is duplication of field and metering costs and additional wait times for customers
- our field crews cover the full geographical spread of our network. They are able to synergise planned works reducing cost and inconvenience for our customers (i.e. complete meter installations or replacements at a similar location at the same time). This is important in rural settings that involve long travel times. Contestable meter providers tend to have scattered customer bases and may have no rural presence—leading to slower meter installations and replacement times, higher cost of service and potentially no service offerings for rural customers
- access to the meshed communication networks provided by AMI means we do not have to rely on cellular networks which have limited range in rural areas. A contestable metering model's reliance on point to point mobile communications will result in many rural customers' meters being unable to communicate with the wider network.

1.3.1 Customer data

We provide customer usage data through our online customer portal. Our online customer portals provide an energy monitoring dashboard which enables our customers to monitor their usage and download data to compare retail offers. The data is updated every 24-hours (with upgrades taking place to update data every hour), allowing customers to track their data from up to the day before. By tracking their usage, customers can identify their consumption and export trends (for customers with solar exports), and potentially isolate tracking of appliances. Customers can also link their data through to the Victorian government's Victoria Energy Compare website to determine whether it is in their interests to switch retailers.

We protect our customers' data by ensuring we adhere to regulatory obligations relating to data privacy and security. Third parties can access customer data by receiving customer consent. Importantly, we have no incentive to limit the access to customer data by third parties as we do not compete for customers. Retailers have very strong incentives to retain customers hence an incentive to deny, or make very difficult, third party access to data.

1.4 The cost of metering services in falling in Victoria

The cost of metering services in Victoria will fall significantly on 1 July 2021 compared to 2020, and will continue to fall for the next decade. CitiPower customers will pay 22% less for metering from July 2021, Powercor customers will pay 13% less and United Energy customers will pay 29% less. This is due to the metering regulatory asset based (RAB) and communication network being largely fully depreciated and very low failure rates (less than 0.4% per annum).

Not all meters will require replacement at the end of their economic life and as such, there is unlikely to be a need for a second roll-out. The meter stock is continuously being diversified through new connections, and we continuously monitor our meter fleet for any common defects amongst families of meters to ensure the defects and potential failures are addressed prior to failure.

We estimate the vast majority of our meter stock will remain operational post 2030, hence customers will continue to see falling metering service costs whilst the benefits continue to grow.

1.5 Victorian AMI functionality is crucial to the continued delivery of AMI benefits

The Victorian AMI functionalities are crucial to the continued delivery of AMI benefits. While it is possible some smart meters installed interstate have parts of the Victorian AMI functionalities, these functionalities are not mandated under the National Minimum Specifications.

While all customers with smart meters benefit from moving to remote reading, Victorian customers also benefit from the rich source of power quality data used for network management and optimisation. Victorian smart meter functionality is essential to obtaining full visibility of the LV network and managing the energy transition.

Therefore, the continuation and realisation of the full range of smart meter customer benefits is highly dependent on key functions that are required under the Victorian functional specification.

1.6 Obtaining meter data from third parties is costly and reduces all benefits

Even with the Victorian AMI functionality, under contestable metering it is not feasible for multiple third parties to provide the volume of AMI data we require across the entire network in real time. At the same time, the transaction cost of purchasing data, and ensuring the synchronisation of multiple IT systems is highly costly for customers.

Currently, there is no guarantee (or even expectation) that a third party will:

- collect and provide real time power quality data (e.g. voltage)
- have communication networks capable of providing the vast amounts of data to distributors in real time—this requires developing advanced communications networks or paying for excess capacity
- have consistent communication systems that will integrate with our IT systems so that we can process and use the data in real time.

While some third parties may be willing to provide these services, other providers may seek to minimise their costs to increase market share through reducing the number of services available. This is evident in the Victorian contestable metering market (for type 1-4 meters), where power quality remains unavailable despite customers even seeking such data.

Not having direct access to the real-time meter data limits customer benefits distributors can extract from smart meters. Some initiatives we undertake that would potential be lost were contestability be introduced include:

- neutral fault testing; a critical safety function
- RERT services for avoiding load shedding
- operating a Dynamic Voltage Management System (DVMS) for enabling solar PV (see section 2.1 for an explanation of the DVMS). DVMS relies on real time AMI data from all AMI meters to ensure power quality is maintained within code. It is not feasible to achieve this if smart meters are provided by several third parties.

2 Smart meters enable DER and two-sided markets

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.

2.1 We are already facilitating two-way flow on our network through use of smart meters

We already use our smart meter fleet to enable exports and two-way energy flows. We estimate solar PV capacity across our networks will more than double over the next five years, which opens opportunities for our customers to significantly increase solar exports and effectively participate in two-sided markets. However, solar exports cause network voltages to increase. When voltages rise sufficiently high, customers' solar inverters trip off and stop generating for both own consumption and for exports.

To maximise our customers' investment in solar, in 2019 we conducted the most comprehensive analysis of AMI data across our network ever. Our analysis relied on power quality data, which is a key functionality of Victorian smart meters. Having access to this data allowed us to develop a new, fair and efficient way to balance the opportunity to enable more solar PV whilst identifying where best to invest in network capacity.

Using AMI data and relying on the nearly-full visibility of the LV network, we were able to develop the following innovative approaches to efficiently enabling more solar on our network:

- Dynamic Voltage Management System (DVMS)—we designed and implemented a new IT system to dynamically manage voltage. DVMS remotely and dynamically changes the set points on zone substations to increase/decrease network voltages depending on the prevailing network conditions. This relies on voltage data collected every 5 minutes by our AMI meters across the whole network so that it operates continuously. DVMS significantly increases the network's hosting capacity for solar at a low cost.
- efficient transformer tapping—a low cost solution to voltage issues at a transformer is to 'tap down' a distribution transformer's voltage. Before tapping a transformer down we need to examine the minimum voltage customers on that transformer experience to determine whether their voltage will fall below acceptable limits once tapped. We need live up to date data before actually tapping a transformer.
- online tool for solar export pre-approvals—to inform customers correctly with regard to how much solar they can export once they connect to the network requires us matching new connection applications to each transformer on the network. We will then look up the current voltage distribution and apply our voltage forecast to determine how this will change with the new connection. We have developed a new online tool that does this automatically; however it relies on frequent voltage information for each customer for this to be effective.
- ensuring compliant inverters for better operation and safety—we use AMI data to identify non-complaint smart inverter settings on solar sites across our network (that is, homes exporting solar when they have been export limited or are exporting more than their allowed capacity). We are expecting even more non-compliant sites given we will be requiring installers to apply volt-var and volt-watt settings to new installations. From discussions with distributions in other jurisdictions, they estimate

non-compliance rates with these settings of 95%, but are unable to identify the actual locations due to not having AMI.

Without the smart meter data:

- we would have no visibility of the LV network and would have to rely on outdated manually obtained data to plan our network, leading to inefficient outcomes and ultimately higher costs to our customers
- due to the need to take a conservative approach without access to real-time data, customers would experience significantly more solar constraints than necessary
- there would be less equity in who can export, with customers that connected first being able to export more than they should at the expense of others.

2.2 Enabling dynamic network management and customer participation

As DER penetration grows, and behind the meter systems become more sophisticated, smart meter data will be crucial in facilitating efficient dynamic solutions and eventually dynamic pricing. Real time AMI data is required to monitor each circuit in the LV network to produce dynamic 'operating envelopes' for DER. Operating envelopes are the maximum capacity of DER which can be accommodated on the network without causing over voltages—leading to asset failures and supply outages.

Without real time AMI data we would need to constrain the participation of DER using conservative estimates of our operating envelopes. This would limit the opportunity for third parties to develop behind the meter DER services.

2.3 Distributor-led smart metering supports behind the meter services

The development of behind the meter services and DER is not impeded by the current metering arrangements in Victoria. We are currently working with third parties (customers, retailers and aggregators) to improve their ability to develop behind the meter services that can be assisted through smart meters.

We understand third parties are seeking more visibility of the constraints on the LV network. To that end, we provide third parties with aggregated AMI data on request to assist them in building their business cases. For example, we provided aggregated consumption and generation data collected from our AMI meters to the City of Melbourne to assist them with their calculation of carbon dioxide (CO₂) emissions.

We are also working with C4NET on a Victorian Government supported project to develop a standardised platform for sharing of aggregated LV constraint data in an easy-to-use format for third parties. Once available, this platform will include data from all Victorian networks on a shared platform, allowing third parties to synergise their data collection and develop non-network solutions in areas of most need.