

3 February 2022

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

Dear Anna

Re: Draft determination: Governance of distributed energy resources technical standards – ERC0319

CitiPower, Powercor and United Energy welcome the opportunity to comment on the governance of distributed energy resources (DER) technical standards draft determination.

Our customers continue to drive the unabated growth of solar photovoltaic (PV) systems across our networks and now represent the largest source of distributed generation in our networks. Unfortunately, this growth has been accompanied by poor compliance practices that cost both solar and non-solar customers. It is therefore with some disappointment that the draft determination is silent on the issues of compliance and enforcement.

Since the draft determination, we have appreciated the opportunity to meet with Australian Energy Market Commission (AEMC) staff working on the Rule change and have had the opportunity to raise our concerns with compliance and enforcement. In our view the discussions have been positive. This submission seeks to capture the essence of those discussions and where possible quantify the extent of the issues we seek to be addressed.

What's the problem?

Data collected from 48,600 residential solar PV systems installed since January 2020 across our networks found most solar PV systems non-compliant with the mandated power quality response mode settings for smart inverters. In addition, some solar PV systems were found to be exporting above the limit agreed in their connection agreement.

Non-compliance results in a decline in the value received by customers, impacts the quality of the electricity supply and may lead to higher network costs borne by all customers. In particular:

- impacts the performance of a customer's solar PV system
- reduces the financial benefits received by the solar customer from exports
- limits available export capacity for future customers seeking to connect to the grid
- negatively impact the voltage performance of the network, potentially resulting in non-compliances with relevant regulations for the distributor
- may reduce the capability of distributors to respond to contingent events in the National Electricity Market
- increase network costs as the distributor seeks to increase network hosting capacity and/or remediate voltage issues.

How widespread is the problem?

From December 2019 we have mandated the use of smart inverters with specific power quality response mode settings for new solar PV systems. We did this to ensure customers experienced less system trips resulting from voltage fluctuations, achieved better solar export performance and to improve the solar PV hosting capacity on our network to allow other customers to connect and export solar.

Customers eligible for rebates under the terms of the Notice to Market for the Solar Homes Program are required to have the smart inverter power quality response modes:

- ‘Volt-Var’ settings which provide dynamic reactive power output and reduce the impact of voltage rise from solar exports
- ‘Volt-Watt’ settings which reduce real power export once specified voltage limits are reached to minimise voltage rise from solar exports.

Installers are required to confirm that power quality response mode settings have been applied at the application stage using our model standing offer (MSO) documentation.

Since December 2019 for CitiPower and Powercor, 43,500 new solar PV systems were installed between installed at the preparation of this submission. Using our smart data analytics capability we have identified:

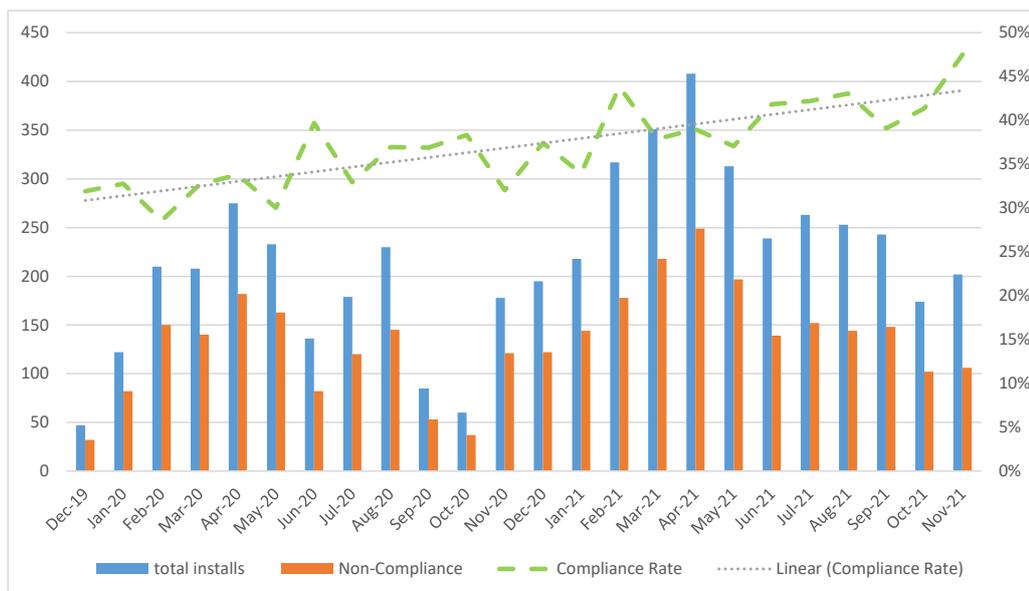
- of these new installations, 80% (34,779) are non-compliant with smart inverter settings
- 991 installers were responsible for these installations with varying levels of compliance with inverter settings:
 - 263 (26%) were responsible for a small number of installations (834) but none of their installations were compliant
 - of greater concern are the 441 installers responsible for 28,463 solar installations (65% of the total undertaken) which are assessed as being between 70% and 90% non-compliant.

By August 2020, these results were impacting solar export pre-approval rates for new solar customers. The introduction of a new tool in September 2020 to support pre-approval assessments (and which automatically factored in voltage issues) led to export approval rates dropping from around 80% to just over 60% in November 2020.

In United Energy, we were able to analyse around 20 per cent of installations (5,138 installations) to assess whether the smart inverter settings were working. We found that that 62% (3,206) of those installations were non-compliant with the required smart inverter settings.

The compliance rate has been improving over time, as shown in the graph below.

Figure 1 Smart inverter compliance trend with power quality settings



Source: United Energy

The significant non-compliance rates and growth in installations has led to United Energy developing a pre-approval tool to be introduced in May 2022.

In addition to power quality settings, inverters may not comply with the protection settings specified in the MSO. For example, over-voltage settings may be set incorrectly such that the inverter does not trip instantaneously when the network voltages rise to a particular level.

The rate of non-compliance, and numbers of installers involved, demonstrate a widespread issue with non-compliance. This is despite education programs, information sessions, and training initiatives to build the capability of the sector. With the number of new solar PV systems forecast to accelerate, there is an urgent need to reduce the high volume of non-compliance.

Networks have regulatory obligations to protect all customers

We are obligated to actively manage and monitor voltages across our networks to ensure we maintain power quality for all customers. The Rules and Victorian Electricity Distribution Code require us to maintain voltages on our low voltage network in accordance with AS 61000.3.100.

There are many factors that influence a distributor's voltage performance. Inverter non-compliance can contribute to voltage excursions outside of the Australian Standard. For example:

- if Volt-Var settings are correctly set, then all inverters continue to export reactive power which keeps the overall voltages on the network down, thereby increasing overall solar hosting capacity. If they are incorrectly set, then voltages on the network may rise
- if Volt-Watt settings are correctly set, then exports are optimised to the networks hosting capacity. If they are incorrectly set, then inverters may export more than the hosting capacity and disconnect when inverter voltage protection limits are reached. Disconnection will result in complete loss of export for the customers and leads to customer complaints and inefficient operational and capital expenditure
- if the over-voltage settings are correctly set, they will trip the inverter when the voltages reach a particular threshold. If these protection settings are over-ridden, the inverters will continue to export when voltages on the network are too high which may impact network safety.

Customers and/or distributors are likely to observe non-compliances in voltage performance where inverters do not have the correct power quality and protection settings. This leads to customer complaints and sub-optimal investment in hosting capacity.

Currently, distributors are engaging in discussions with the Australian Energy Market Operator (AEMO) and governments to find potential solutions to address minimum demand on the network. One potential solution being explored is the ability for distributors to increase voltages on the network to trip distributed energy resources (DER) at times of low operational demand. Once tripped, customers who are self-consuming from their solar PV system would then take load from the network thereby redressing the minimum demand issue. However, if inverters have incorrect over-voltage settings, then the inverters may not trip and the distributor would be unable to assist with addressing the minimum demand issue.

Distributors may augment the network to increase hosting capacity and/or improve voltage performance, leading to higher network costs for all customers.

Why are inverters non-compliant?

In Victoria, we are fortunate to have a ubiquitous smart meter network which allows us to identify non-compliant inverters through smart analytics. This has allowed us to identify the potential causes of inverter settings not aligning with the Australian Standard or conditions set out in the customers agreement with their distributor.

1. Manufacturer fault: the manufacturer may have produced a faulty inverter, or the instructions to the installer may be incorrect. We are aware of a situation where the installation handbook provided by the manufacturers was incorrect, leading to incorrect settings. We identified the issue and informed the manufacturer, with the issue subsequently rectified.
2. Solar installer fault: this appears to be the primary cause of incorrect inverter settings, where installers are either not properly trained, not competent or wilfully apply incorrect settings. This matter is discussed further below.
3. Customer fault: customers may over-ride the settings on their inverters. For example, they may over-ride the protection settings to export even when network voltages are high so that they receive the feed-in tariff.

Customers need to be protected

Our data suggests almost 40,000 customers across our networks who, since January 2020, have installed solar PV systems are not be receiving the full benefit of their investment. Typically, they may be experiencing more frequent trips which mean their systems are not always generating power for their home or to export. Customers are largely unaware of the inverter settings required or applied. They are reliant on the advice and expertise of solar installers. A qualified solar installer or registered electrical contractor would need to be engaged to perform any corrections needed to settings. This means corrective actions become dependent on acting within warranty periods to minimise the risk of additional cost to customers.

It is noted the original Rule proposed the MSO and deemed distribution contract be amended to protect customers. Whilst we support the intent, our view is it will not protect customers with respect to installers or manufacturers. Neither are market participants bound to these agreements or to the Rules.

Is there a solution?

From 18 December 2021, our MSO was updated to require that new inverters connected to our distribution network must comply with the Australian Standard (AS) 4777.2.2020. This has updated power quality and protection settings.

We have attempted to address the inverter non-compliances through various methods.

1. Advise customers of non-compliance and ask them to contact their installer

We have been sending letters to customers to notify them that their inverter is not complying with the Australian Standard and/or the terms and conditions in their connection contract. However, not all customers respond to these letters. It may be the customer does not read the letter or chooses to do nothing; or they contact the installer and the installer requires the customer to pay to visit the premises, or the installer chooses to do nothing. Powercor recently sent letters to 47 residential customers to advise of the non-compliance. At the date of this submission, our network analytics indicated that only two customers had rectified their installation.

2. Disconnect the customer inverter

While distributors may have the ability to disconnect the customer inverter, that may seem like a drastic action and be contrary to government policy intent to increase use of renewable energy.

3. Improve solar installer performance

We are working with the Clean Energy Council (CEC) and Solar Victoria to ensure:

- solar retailers and installers are effectively educated on installation requirements for the new smart inverters, particularly as we are aware that some models will still require Australia A to be selected by the installer (that is, not simply set as a default)
- we are seeking opportunities to simplify the documentation required from solar installers at each stage of the process from pre-approval to grant payment in order to improve compliance.

We are seeking to utilise commissioning reports submitted via the CEC's MyJobs application as evidence of compliance with the Australia A settings. However, the CEC have been advised only 14 percent of accredited solar installers are actually using MyJobs.

Other possible solutions

The Clean Energy Regulator (CER) released a report in September 2021, Integrity Review of the Rooftop Solar PV Sector. The review was targeted at addressing customers issues, defective installations, misuse of installer accreditation details and safety and quality concerns in the sector.

The recommendations in the review included:

- giving the CER responsibility for setting eligibility requirements for an installer accreditation scheme and the listing of eligible solar components
- implementing new and streamlined reporting requirements for installers, solar retailers and manufacturers
- giving the CER more effective powers to monitor and enforce compliance, including the ability to suspend installers, disqualify retailers and de-list components
- developing consumer information to help customers navigate the rooftop solar PV system sector and avoid dishonest operators, empowering customers with the information they need to make informed choices about their rooftop solar PV system.

It is noted these recommendations have all been subsequently accepted by the Australian Government.

We believe this report provides the basis for a model whereby the CEC maintains its industry body role in administering installer accreditation and component listing whilst the CER takes on the enforcement role. Combined the CER and CEC have more capacity and expertise to oversee enforcement of technical standards and ensure compliance among retailers and installers than alternatives such as the AER or distributors.

It is important to recognise that distributors, especially those in Victoria, are well placed to identify non-compliance through smart meter infrastructure and their data analytics capabilities. This importance source of data should be recognised, and formally embedded, to ensure enforcement is effective. As hosting capacity diminishes it is clear all customers will benefit if the AEMC set out in its final determination the consideration of the role of the CER in assisting distributors with inverter compliance.

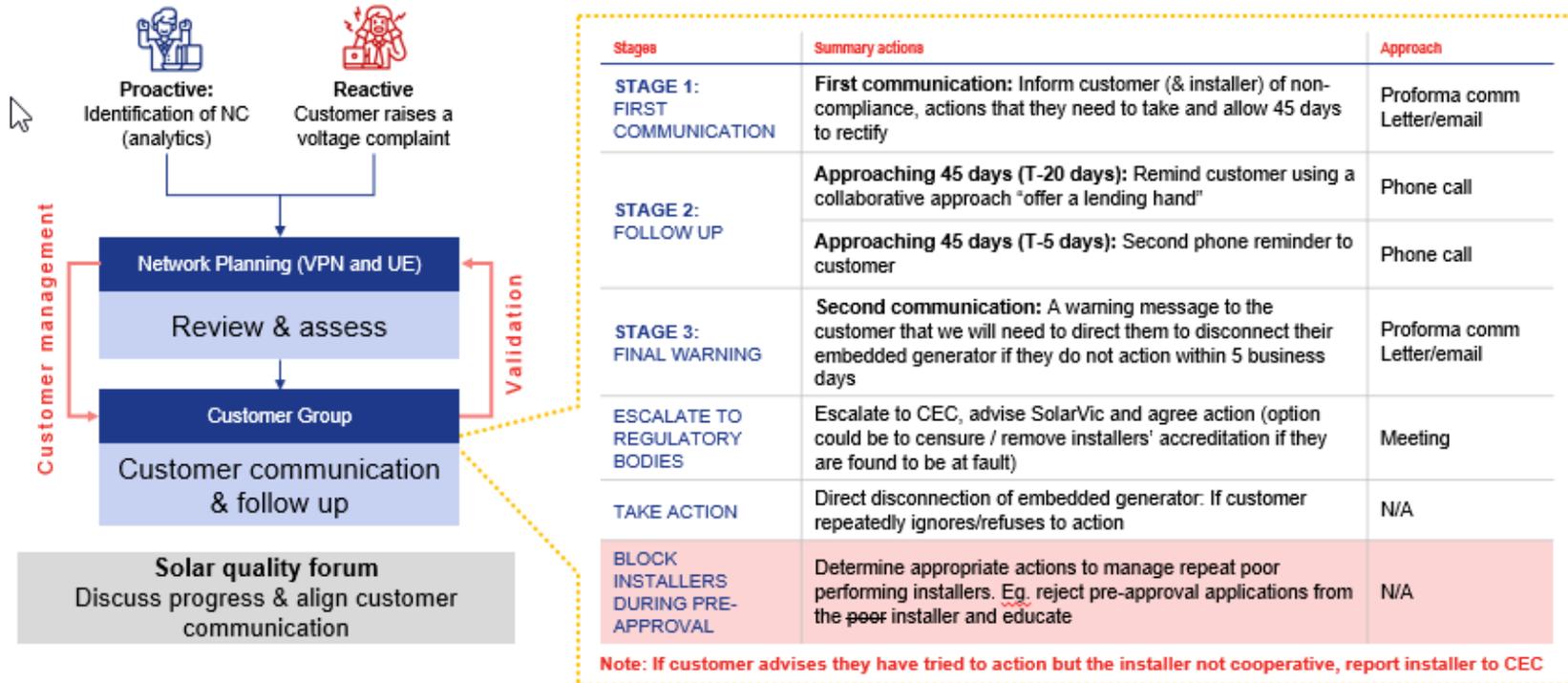
Should you have any queries about this submission please do not hesitate to contact Elizabeth Carlile on 0419 878 852 or ecarlile@powercor.com.au.

Yours sincerely,



Brent Cleeve
Head of Regulatory Policy and Compliance
CitiPower, Powercor and United Energy

We will have a three stage customer communication process and will proactively work with customers to ensure non-compliance rectified



We aim to work closely with the customer to ensure that the rectification is carried out and that no escalation and/or action will be required.