



Australian Energy Market Commission
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3rd November 2022

Subject: Review into consumer energy resources technical standards

Thank you for the opportunity to provide feedback to the AEMC Consultation Paper “Review into consumer energy resources technical standards,” (the Consultation Paper).

This is a joint response on behalf of both Rheem Australia Pty Ltd (Rheem) and Combined Energy Technologies Pty Ltd (CET), as we have a complementary interest in the Consultation Paper due to the range of Consumer Energy Resource (CER) products we manufacture and install, and our involvement in a number of relevant Standards Australia technical committees, including EL-054 and EL-062.

As the largest Australian manufacturer of water heaters with products in over 4 million Australian homes, Rheem offers a wide range of traditional and renewable energy water heater models to the domestic water heating market under the Rheem, Solahart, Vulcan, Aquamax & Everhot brands. Under our Solahart brand we are the third largest supplier of photovoltaic (PV) systems in the country. Over the last four years we have also commenced the manufacture and installation of smart electric water heaters, controlled remotely by our technology partner, Combined Energy Technologies.

Combined Energy Technologies is an Australian technology company specialising in energy management for residential, commercial, and micro grid systems. CET provides site energy management systems and has extensive experience in the integration and orchestration of systems with multiple CER, including the integration of solar PV, batteries, water heating, electric vehicle chargers, pool pumps and A/C for the benefit of the homeowner, retailer and the grid. Our references to CER should be read to include both generation and flexible load assets, unless prefaced by IES (Inverter Energy Systems).

Together, Rheem and CET are already actively participating in the emerging DER market with thousands of online, mixed, orchestrated DER sites across the NEM and the WEM with near 100% of our sites orchestrating one or more types of CER. Over the past decade we have identified and resolved many issues (at live field sites) to ensure that mixed, smart DER sites can be orchestrated to achieve the best financial outcomes for consumers, whilst providing a foundation for grid support services and hence grid security of supply.

If the energy market is to be truly democratised, it is important that any changes to market rules and associated technical specifications are made with the consumer at the centre of the solution. This will ensure that current and future investment in smart CER by households continues to be made. Fundamental to this approach will be that new rules do not favour a particular technology, technology class, or technology manufacturer, and that technology neutrality is not impeded by barriers to entry arising from energy market rules. Our specific comments and recommendations attached are underpinned by this approach.

As Australian based manufacturers we have made large R&D investments in bringing to market cost effective CER products and technology for the integration and orchestration of CER behind the meter.



Further, we have a desire to ensure technology neutrality, support for standards, consumer outcomes, and adherence to the principles of the NEO in the design of new market services and regulations.

Our comments and recommendations do not address all of the Consultation questions raised in the Paper. We have limited our response to the key areas of concern where we have direct experience with the consumer DER experience. Each of these is discussed in Annexure A below.

As this submission has been prepared using the expertise of several of Rheem and CET's personnel, I would ask that any enquiries related to the submission are directed in the first instance to myself. I will then co-ordinate follow up responses to your enquiries or further meetings with the appropriate personnel within our organisations.

Yours Sincerely



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ANNEXURE A -

1.1 Rheem/CET response to the Review into consumer energy resources technical standards

The objectives of the review are stated as:

- compliance with, and enforcement of, CER technical standards in the NER
- the interpretation of standards by NEM participants and others
- interactions between the National Electricity Rules (NER) and other regulatory regimes.

There are already over 3 million households with PV in Australia, and this is expected to grow significantly in the coming decades. We applaud your recognition from the Customer Insights Collaboration work program “that the timely and consumer-friendly standardisation of energy technologies (including installation and operation) can play a critical role in meeting consumer expectations of CER. Relevant technical standards that are effectively enforced can assist in achieving this outcome.”

Accordingly, it is imperative that the AEMC improves the current arrangements in the development, governance, and compliance arrangements for CER technical standards in the NEM. This will ensure that Australian consumers maximise the benefits from their substantial investment, and that the grid maximises its CER hosting capacity. There are a number of key issues that are not addressed by the current arrangements, nor are they being given the attention or urgency they deserve. These concerns are discussed below.

1.2 Nationally consistent governance arrangements

We would strongly argue for the development of a nationally consistent approach to compliance, governance and enforcement. To date compliance and enforcement of technical standards has been delegated to the DNSPs, by virtue of their connection agreements. The evidence would suggest that this approach has been inadequate in a number of areas. In particular there has been inconsistent interpretation and application of the technical standards across DNSPs. For example, there are three variants for volt/var settings in Australia, dependent on DNSP, with the majority of DNSPs requiring Region A settings, whilst others are using Region B and C settings.

There are also jurisdictional differences already appearing in the application of emergency solar management and dynamic export +. These different standards significantly complicate the training of installers, and can almost guarantee that non-compliance will occur. This is likely to be exacerbated as the complexity increases.

1.3 Compliance and enforcement of technical standards

We acknowledge that the AEMC has identified 5 distinct roles under its CER work plan. However, we would suggest that there is a gap in this work plan regarding the compliance and enforcement of the technical standards.

The Consultation Paper uses the inverter ride through settings in AS4777.2.2020 as an example of non-compliance of technical standards in the NEM. While it is helpful to use this as an example to assess the current compliance arrangements, there is a risk that solutions are addressed at this specific use case only. We are also aware of other significant non-compliance issues by some CER manufacturers, including a non-compliance of the mandatory requirement under AS4777 to include a DRMO (grid safety disconnect) interface on the product as defined within AS4777. We consider this to also be a critical issue for grid management as the penetration of CER increases. This situation has resulted from

providers effectively self-certifying their compliance. This is because the current compliance process is effectively a “black box” with no 3rd party visibility of testing, auditing or follow up compliance checks. This process is open to abuse in the absence of transparency or overriding governance.

Finally, we would suggest that the focus of the Consultation paper should be to evaluate the ability of the current framework to address the impending “future state” use cases. These use cases will include Dynamic Operating Envelopes, Dynamic Export Limits, mass orchestration/VPPs of fleets of CER for the two-sided market, and device interoperability. Compliance with CSIP-AUS and behind the meter technical standards for interoperability would benefit from nationally consistent standards testing protocols and associated certification of compliance.



2.0 Responses to some of the specific questions raised in the Consultation Paper

QUESTION	RESPONSE
1. Is the proposed assessment framework appropriate? Are there any other relevant considerations that should be included in the assessment framework?	<p>The proposed “Consumer Outcomes” criteria of the assessment framework does not seem to give sufficient recognition to the key findings of the ESB “DER Implementation Plan Customer Insights Collaboration”¹. We refer to consumer “Trust” being identified as a critical barrier to the adoption of CER. We believe that any non-compliance in technical standards will have a significant impact on customer trust levels. For example, any non-compliance with technical interoperability standards could leave customers locked in both technically and commercially due to their choice of CER. This may result in additional costs and complexity for customers. The ability for the compliance and governance protocols to improve customer trust in purchasing DER should be a primary consideration for the assessment framework.</p> <p>Similarly, the ability of the process to reduce complexity for the customer should also form part of the assessment framework. Simplicity was identified by ACIL Allen² in its report to the Customer Insights Collaboration.</p>
QUESTION 2: COMPLYING WITH CER TECHNICAL STANDARDS	
1. What is the rate of compliance with the NER’s minimum inverter standards for micro embedded generation units?	NA
2. Do compliance rates differ between NEM jurisdictions? If so, why would this be the case?	NA
3. What are the reasons for any non-compliance by DNSPs, manufacturers and consumers?	Despite DNSP connection agreements requiring CER to comply with standards such as AS/NZS 3000 and AS4777, we would suggest that DNSPs do not have the resourcing or sufficient compulsion to enforce compliance

¹ ESB Customer Insights Collaboration – Release 1 Knowledge Sharing Report, July 2022, available from https://www.datocms-assets.com/32572/1658964111-esb-cic-knowledge-share-report-final_250722.pdf

² ACIL Allen “Barriers and enablers for rewarding consumers for access to flexible DER and energy use - Rapid evidence review” June 2022 available from <https://www.datocms-assets.com/32572/1658964119-barriers-and-enablers-final-report-v2-352146-1-3-1.pdf>



	to the levels required. There is no impost on DNSPs that fail to meet these requirements, as customer connection agreements pass all liability onto the consumer. Further, there are no negative outcomes levied on manufacturers that may choose to ignore mandatory parts of a standard (beyond testing required for certification) in product shipped / deployed in Australia (see AS4777 and DRMO example above).
4. Are there differences in the obligations to comply with minimum inverter standards between the NER and jurisdictional frameworks? If so, what do you understand these differences to be? What is the rate of compliance with jurisdictional requirements for minimum inverter standards?	As noted above at Section 1.3, we are concerned that this single use case seems to be the focus of this discussion paper. It would be more appropriate to undertake a broader investigation of future state use cases that need to be addressed under the governance and compliance framework. For example, a fundamental issue to address urgently is to ensure that CER shipped and deployed in Australia complies with its Certificate of Compliance to AS4777.2:2020. Failure to do so will result in negative consumer outcomes including service provider lock-in and the inability to participate in DEL and DOE programs. Further, there needs to be a robust mechanism for policing and enforcement of compliance, with a documented process for reporting, verifying and rectifying non-compliance. This process should be backed by the NER or another legal instrument that is enforceable on a national basis.
5. What are the rates of compliance with other CER technical standards obligations under jurisdictional frameworks?	N/A
QUESTION 3: MARKET IMPACT OF NON-COMPLIANCE FOR CONSUMERS	
1. What are the costs and benefits for all consumers from device owners complying with the NER's CER technical standards?	Compliance with technical standards will be key to maximising the grid hosting capacity for PV and other CER, as long as interoperability is embraced to avoid consumer lock-in and CER asset stranding.
2. What are the costs and benefits for device owners from complying with the NER's CER technical standards?	Technical compliance ultimately benefits all consumers as it builds trust and confidence in their investment in CER. Compliance with CER technical standards which mandate local BTM CER interoperability increases consumers' ability to leverage their CER asset across competitive market offerings, avoiding both technical and commercial CER lock-in.
3. Are consumers facing any market-wide costs from non-compliance by device owners?	Yes, non-compliance is likely to lead to lower grid hosting capacity for CER, which would reduce access to the lowest cost form of generation. CER that does not comply with interoperability, or even basic control such as

	mandatory DRMO control, leads to sub-optimal orchestration of behind the meter CER resulting in consumer financial loss and consumer CER lock-in. Our field experience indicates that there is a growing impact on grid security of supply when non-interoperable CER negates the actions of orchestrated CER supporting grid services such as DR and FCAS.
4. How are consumers able to manage compliance costs?	See answer to question 2 above
5. Do consumers face any other detrimental experiences from non-compliance, such as complex experiences installing and operating devices?	This is a major concern for the proposed technical interoperability standards. Consumers should expect that the remote and local coordination of their CER devices works seamlessly. As detailed in Q3 above, CER that does not comply with interoperability, or even basic control such as mandatory DRMO control, can result in sub-optimal orchestration of behind the meter CER resulting in consumer financial loss and consumer CER lock-in. Our field experience indicates that there is a growing impact on grid security of supply when non-interoperable CER negates the actions of orchestrated CER supporting grid services such as DR and FCAS.
6. Are device owning consumers aware of their obligations to comply with CER technical standards under the NER?	No, they would typically not be aware of their obligations
QUESTION 4: MARKET IMPACT OF NON-COMPLIANCE FOR DNSP'S AND OTHER NON-NEM PARTICIPANTS	
1. What are the costs and benefits for DNSPs complying with the NER's CER technical standards?	NA
2. Are these compliance costs and benefits expected to change with the NEM's increasing reliance on CER?	NA
3. Do DNSPs face any significant challenges complying with jurisdictional requirements for CER technical standards? If so, how do these external challenges affect compliance with the NER?	NA
4. How are DNSPs responding to non-compliant consumers?	DNSPs will issue a defect notice and take action corresponding to the safety impact of the defect. This can range from the inspector turning off power to the site where there is a potential risk to safety (e.g. electrocution), down to a minor defect where the power is not turned off and (DNSP dependent) the installer and/or manufacturer is given a defect period to rectify installation and/or equipment faults. That period could be 30 days (DNSP dependent). In such cases the CER / equipment may be tagged off or left on, dependent

	on the severity of the infringement. If the defect is not rectified, the DNSP can permanently disconnect the offending equipment and/or issue fines - typically on the installer. In each of these instances there is a significant impact on the consumer and an obligation to seek resolution from their installer. Stronger controls and enforcement on manufacturers and importers are required to ensure all equipment is standardised and compliant. This would reduce the impact of these issues on the consumer.
5. What are the costs for non-NEM participants (such as OEMs and installers) from complying with the NER's CER technical standards?	If the NER's technical standards mandate internationally recognised standards, then manufacturers will be able to ship CER to Australia with minimal modifications. Our estimate is that this change would result in benefits outweighing any costs. For example, California's Rule 21 (in force in early 2023) will mandate that CER supports local interoperability via SunSpec Modbus under IEEE1547. Interoperability through standardised physical interfaces and open control protocols will ensure a level of consistency that leads to lower installation costs. If we look to the telecommunications industry as an example, standardisation and interoperability has expanded services and competition for consumers across wireless and wired networks and driven down the costs for associated network communications equipment significantly.
QUESTION 5: ENFORCEMENT AND OTHER POTENTIAL SOLUTIONS	
1. How are CER technical standards in the NER enforced?	CER technical standards enforcement is largely delegated to DNSPs.
2. What are the benefits of existing enforcement approaches? Are there any challenges?	Minimal benefits are being demonstrated as the enforcement mechanisms are used to protect the distribution network and not the consumer.
3. What, if any, gaps are there in the enforcement framework for DER technical standards?	As noted in Section 1.2 above, we believe this approach is demonstrating sub-optimal outcomes for the consumer.
4. How can the NEM's market bodies work with non-NEM participants such as original equipment manufacturers, to improve compliance?	We believe that Australia requires a nationally consistent application and interpretation of technical standards, along with a nationally consistent compliance testing process to certify each new model installed by OEMs. A fundamental issue to address urgently is to ensure that CER shipped and deployed in Australia complies with its Certificate of Compliance to AS4777.2:2020. Further, there needs to be a robust mechanism for policing and enforcement of compliance, with a documented process for reporting,

	verifying and rectifying non-compliances. This process should be backed by the NER or other legal instrument that is enforceable on a national basis.
5. Are you aware of any penalties being applied to NEM participants for non-compliance with CER technical standards?	None
6. How do jurisdictions enforce CER technical standards (including the use of penalties)?	See response to Q4 Part 4 above. There needs to be more rigorous enforcement of CER technical standards. DNSP defects are usually limited to safety related issues.
7. How do jurisdictional frameworks interact with NEM-wide CER technical standards introduced through the NER?	Currently there are different applications and interpretations of technical standards across different jurisdictions. There needs to be national consistency so that installers are not confused as to which applies.
8. Is the ability of NEM participants to comply with technical standards in the NER affected by jurisdictional regulatory requirements?	Yes – see above
9. What are some solutions for non-compliance with CER technical standards?	OEMs should submit each model of their equipment for compliance certification testing to demonstrate they meet the technical specifications. This could be undertaken as an extension of the CEC existing accreditation process. However there needs to be an element of random subsequent check testing to ensure continued compliance.
10. Are there any solutions from other jurisdictions that should be considered, both domestically and internationally?	The telecommunications industry uses globally recognised test processes to ensure technical standards are complied with to ensure interoperability. For example, 3GPP compliance with 4G and 5G communications standards.
11. Who should be responsible for compliance and enforcement of CER technical standards in the NER?	This should be the responsibility of the Australian Clean Energy Regulator, and avoid where possible delegation to the DNSPs.