Rheem Australia Pty Ltd ABN 21 098 823 511

Australian Energy Market Commission
GPO Box 2603
Sydney NSW 2000

By web submission: https://www.aemc.gov.au/contact-us/lodge-submission 14 September 2023

To Whom IT May Concern

Re: Directions Paper - National Electricity Amendment (Unlocking CER Benefits Through Flexible Trading) Rule 2023

Thank you for the opportunity to provide feedback on the Directions Paper on Unlocking CER Benefits Through Flexible Trading (**The Directions 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 Directions Paper due to our involvement in the EDGE and other programs and as a result have some direct experience relevant to Flexible Trading.

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 manufacturing and installing 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 microgrid systems. CET provides site energy management systems and has extensive experience in the integration and orchestration of systems with multiple Distributed Energy Resources (DER) 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 DER should be read to include both generation and flexible load assets.

Together, Rheem and CET are already actively participating in the emerging CER market with thousands of online, mixed, orchestrated CER sites across the NEM and the WEM, with nearly 100% of our sites orchestrating one or more types of CER (generation and flexible load). Over the past decade, we have identified and resolved many issues (at live field sites) to ensure that mixed, smart CER 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.

Empirical data from an existing fleet of thousands of consumer sites support our comments and recommendations. Further validation is derived from our participation as an aggregator in AEMO's project EDGE. The data from our sites supports the technical, architectural, and commercial positions in our feedback to the AEMC Directions Paper, which we believe are in alignment with the principles

of the National Electricity Objective (NEO), the CER Efficiency Objective, and a key Energy Security Board principle of no consumer lock-in.

If the energy market is to be truly democratised, any changes to market rules and associated technical specifications must be made with the consumer at the centre of the solution. 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 in creating or modifying energy market rules. This approach underpins our specific comments and the recommendations attached.

In responding to the Consultation, we have restricted our comments to questions with direct and relevant experience. 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 coordinate follow-up responses to your enquiries or further meetings with the appropriate personnel within our organisations.

We ask that this submission be considered in addition to our submission on AEMC Flexible Trading Arrangements (FTA) rule change consultation paper submitted on the 16th of February 2023 .

Yours Sincerely

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QUESTIONS

QUESTION 1: ENERGEIA COST AND BENEFIT ANALYSIS APPROACH AND METHODOLOGY

Are there any other considerations or issues you consider should be included in Energeia's assessment approach and proposed methodology?

Energeia's CBA approach does not consider the financial losses to a consumer that can occur when there is disparate control of individual CER resources without site-wide coordination of all CER (flexible load and generation) assets which also requires knowledge of passive load activity.

For example, at a particular time, a battery reserving power under a VPP may not be the best application for the consumer. It may be the case that optimising solar self-consumption to use power in a later high tariff period may provide a better financial outcome for the consumer. Another example may be that heating water may be a better use of excess solar PV rather than a battery taking the excess solar forcing the water heater to purchase power later at a potentially higher tariff. There are many such scenarios once a consumer has multiple CER assets to optimise with solar, and/or via tariff arbitrage / loading shifting and/or with knowledge of site heuristics. In our experience, separate disparate control of CER resources cannot deliver a better outcome for the consumer than a site-wide "whole of home" approach to orchestrate CER assets for the consumer's benefit.

We have provided further reasons and empirical evidence from nearly circa 5,000 Rheem / CET orchestrated CER sites across the NEM and WEM where we have proven the "whole of home" approach to CER orchestration in backing our statements. Any CBA needs to take the above into serious consideration.

Regarding grid services, again we have provided further details below as to how CER that is not orchestrated will "fight" to negate the grid service that it is contracted to perform. This has detrimental financial impacts on the consumer and FRMP (e.g. hedging) / Aggregator (e.g FCAS) / DNSP (e.g DOE, DR Minimum / Peak Demand Services) along with impacts to grid security of supply as firmness and predictability of CER asset response cannot be guaranteed unless all CER on a site is orchestrated / controlled in unison to provide the grid service. Again, we have empirical field data supporting this statement.

We would happily assist Energeia further to ensure the above scenarios are included in the CBA analysis, approach, methodology and conclusions.

Regarding Figure 3 "NEM Residential End Use Consumption by Fuel Type" - We suggest that the current residential market share for electric hot water compared to gas and LPG appears low. We recommend the BIS Oxford Economics "Hot Water Systems Market in Australia Report" July 2022 as a more accurate estimate of Australia's hot water technology market share.

We note the comment on page 20 that "there will be no feedback loop between electricity wholesale markets and load flexibility". We are concerned that this scope may exclude the largest benefit from flexible CER, which comes from a reduction in wholesale pricing resulting from increasing the distribution network's rooftop PV hosting capacity. It is important to have flexibility in methods such as dynamic export limits to make the most of excess rooftop PV energy. This would lead to a reduction in wholesale costs by decreasing the demand for expensive generators in the wholesale market dispatch process. Hence, any benefits analysis would be incomplete without taking this potential benefit into account.

QUESTION 2: KEY CONSIDERATIONS FOR SEPARATELY IDENTIFYING AND MANAGING FLEXIBLE CER

1. ***What benefits can be gained through separately identifying CER irrespective of whether there is a single FRMP or multiple FRMPs at the customer premises?***

- We would argue that the key objective from a grid security and consumer perspective is to ensure the CER is managed on a "whole of home" basis at the connection point. There are definite benefits to separately identifying CER to provide the greatest flexibility to achieve this objective.

  That is, the grid and consumer's benefits are maximised by having full knowledge and control over other flexible loads and generation (and knowledge of passive loads).
  The reason is, that only when you have information on the home/site as a whole can you make control decisions that are in the best interest of the consumer, as per Clause 17 "consumers should be able to maximise the value of their CER". This cannot be achieved in isolation and without coordination, control and knowledge of the rest of the home/site passive and active loads and generation. For instance, an Energy Market Service Provider (EMSP) who only has knowledge and control of a consumer's battery, does not know when it is financially more beneficial (to the consumer) to use the battery locally (e.g. for tariff arbitrage) vs. the EMSP trading the battery capacity on the wholesale market.
- The term *"separately identifying CER"* has a different meaning in the context of a whole of home approach. As an aggregator of BTM CER running commercial DNSP services for minimum and peak demand services, Rheem / CET have proven that to ensure the best economic outcome for consumers all BTM CER need to be under local control, and that a "NET NMI" approach to asset visibility and orchestration BTM provides better outcomes for the consumer, and predictability and firmness of response in the delivery of grid services for constraint mitigation and security of supply.
- A "whole of home" approach to the local orchestration of CER is critical to ensure the successful implementation of Dynamic Operating Envelopes (DOEs), as compliance at a connection point to a home/site with a DNSP issued DOE requires knowledge of all passive load and knowledge and control of all active CER (Flexible load and generation) to orchestrate the home/site most effectively for compliance with a DOE whilst minimising the financial impact on the consumer. This is also consistent with the CSIP-AUS "gateway model" of CER control for compliance with a DOE.
- Neither the consumer nor the FRMP can assess any financial benefit (or loss) in handing over control of an individually controlled CER asset to the FRMP as the FRMP does not know the local benefits the asset can provide to the consumer that may be negated by the FRMP controlling individual CER assets.

2. Are there additional implementation issues that we should consider for the draft determination (and draft rule if needed)?

Yes. To ensure the best use of CER assets at a home/site there are a number of minimum requirements to be met:

a) A consumer's CER assets must not be locked-in either technically or commercially. The customer should retain the right to churn providers. This will lead to greater competition and innovation in CER market services.
b) A consumer's CER assets must be able access all site resources (e.g., solar PV) without undoing physical wiring changes from another provider that has locked them in. For example, if a proprietary battery asset and the site solar PV are wired under a separate circuit with a proprietary sub-meter such that

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new CER asset(s) cannot utilise the solar PV or control/access the proprietary CER and metering assets, the consumer is then locked-in:

a. technically (no interoperability),
b. physically (wiring), and likely
c. commercially (no open access to control the proprietary assets).

c) Any sub / secondary metering as detailed in b) must be open, interoperable, and accessible to any energy market service provider to ensure a competitive market.

It is important to note that US regulations now recognise local BTM interoperability as a mandatory requirement of inverter-based CER (Solar PV and Consumer battery energy storage systems (BESS)). Australia can leverage those changes locally to provide better outcomes for consumers and the grid. California is the dominant US market for Solar PV and consumer battery energy storage systems, and the California Energy Commission (CEC) Solar Equipment Certification List details certifications to date for UL 1741 SB, which now calls up mandatory local interoperability compliance via IEEE1547-2018. Clause 10 of the IEEE1547-2018 standard defines the required physical interface and open protocols that inverter-based generation systems must support. Several BESS manufacturers who participate in the US market have software disabled this local interoperability capability for battery storage systems delivered to Australia to the detriment of consumers and grid security of supply. Note this lockout can be reversed by an over-the-air software update so the problem is not technical.

Extract of Clause 10.1 as referenced above:

"Clause 10.1 Interoperability requirements specifies requirements for overall DER interoperability. All DERs must have provision for a local DER communications interface that supports interoperability for all applicable DER functions."
AND
In respect to communications protocols supported by the "local DER communications interface" Clause
10.7 states that:
"Clause 10.7 Communications protocol requirements specifies requirements for support of communications protocols that apply at the local DER communications interface. All DERs must support at least one of the following communications protocols:

- *IEEE Std 2030.5 (SEP2),*
- *IEEE Std 1815 (DNP3), or*
- *SunSpec Modbus.*

This capability is [to be] built in to the DERs by the manufacturer. "

In mitigating consumer lock-in in addition to the IEEE 1547-2028 Clause 10.1 requirement above, another aspect of consumer lock-in that needs to be addressed is that commands via the interface in 10.1 should support response times "of no less a time, nor of no less effect than that which is available to the manufacturer or other third party" to ensure a competitive market for the consumer. There are manufacturers now with CER deployed in Australia that restrict certain commands and response times unless the energy market service provider (e.g. FRMP) enters a commercial revenue-sharing arrangement with the

manufacturer for monetising the consumer's CER asset. This is happening even though it is the consumer's asset and the consumer is unaware of the extent to which a third party is generating income from their asset.

Until the above issues are resolved to ensure an open competitive market for consumers with no technical, physical, or commercial lock-in of CER and sub-metering assets, any sub-metering and control of CER assets cannot provide the best outcomes for the consumer and the grid.

QUESTION 3: ENABLING A SECOND SETTLEMENT POINT AT A SINGLE CONNECTION POINT

1. ***Do stakeholders agree the technical and market considerations outlined above are the key considerations we should address in relation to establishing a second settlement point, irrespective of the metering configuration options available and proposed for separating and measuring CER?***

There are a number of technical considerations that have not been considered that directly affect consumer participation, their net financial benefit (or loss due to lock-in), and access to competitive market offerings that may result from all of the proposed configurations. These include Parallel Metering, Subtractive Metering and Multi-Element Metering / a second connection/settlement point to leverage their CER asset(s). We have provided comprehensive information in Questions 1 & 2 above that are also relevant here. The same consumer "test" must apply across any solution.

Any rule change must ensure that:

Metering data (power data) and any metering control functionality must be available locally and in real-time (<1 second updates) for local and aggregated Energy Management Services. While the recent decision by the AEMC in the "Review Of The Regulatory Framework For Metering Services" recognised the benefits of real-time access to data, the specified timeframes (of within 300 seconds) cannot be achieved unless this is also local access.

- This enables a competitive market of services with commercial neutrality to manage the CER assets locally and for grid services. That is, an incumbent (MC, FRMP etc) should not have preferential/privileged access and hence commercial benefit (not afforded to other energy market service providers) in accessing the real-time power metering data/metering control functionality (e.g. channel switching) for local or aggregated control of the CER assets on the home/site on an account holders behalf. The consumer should retain the right to select who they enable such control and access to.
- Further All CER assets must support local standardised control interfaces and open protocols to ensure that consumers are not "locked in" (refer US mandate of UL 1741 SB which calls up IEEE 1547-2018 and clause 10.1 requirements for CER interoperability locally on the CER asset).
- Any wiring changes to the home/site should not lock-in the consumer such that they cannot utilise their CER assets for their best financial outcomes, nor site / CER changes create financial barriers for the consumer (due to wiring changes, proprietary CER interfaces, protocols etc.) when the consumer wishes to add CER to their site, manage all site CER in orchestration, churn their CET assets to a different energy market service provider etc.
- Grid security of supply must also be considered. We have addressed this previously whereby local coordination/orchestration of CER assets is required to ensure that grid services (for AEMO

and DNSPs) can be delivered from BTM CER assets with firmness and predictability. This includes FCAS, DR / DOEs and the like. Situations where disparate control of CER assets on the same site due to proprietary control and or bespoke wiring arrangements can lead to CER assets "fighting" each other causing consumer financial loss and negating contracted responses for grid services such as FCAS and Minium / Peak demand abatement. As we have detailed, we have direct experience and empirical field data on this from both commercial arrangements and industry projects such as AEMO's edge project. We would welcome further discussions on this topic, which we believe would greatly benefit the AEMC in their deliberations on any rule change.

2. ***Should a second settlement point at a single connection point be restricted to defined situations and conditions (e.g. EV charging)? What criteria and governance processes need to be applied when allowing second settlement points at customer premises?***

As noted in our responses to Questions 1 and 2 above, both grid and consumer benefits can only be maximised via a "Whole of home" approach at the connection point. We do not support a second settlement point as the risks outweigh the benefits. If a second settlement point was to be considered, then numerous additional consumer protections are required. These include the following:

- NO, it should NOT be restricted to a defined CER type or situations. As we have detailed in our answers to Questions 1 and 2: the most flexibility, and opportunity for financial reward and cost savings for a consumer only comes from the full knowledge and control of all their CER assets at a home/site in orchestration with all the flexible load and generation and knowledge of the passive loads/home requirements (heuristics). Whilst it may be the consumer's choice to enter into such an agreement, there would need to be strict regulatory requirements in place to ensure that the consumer is "fully informed" of the risks associated with independent control of a particular CER asset without consideration of the adverse financial effects this may cause on their other CER assets at the site.
- There should be no technical, physical, or commercial lock-in for the consumer.

Rheem / CET has circa 5,000 homes with mixed BTM HEMS orchestrated CER across the NEM and WEM. We have extensive empirical field evidence from hundreds of sites of the negative effect that independent control of a particular CER asset (separate from the orchestrated control of other site CER assets) can have on the consumer, and CER assets providing grid security of supply services.

The following are two typical examples of occurrences across hundreds of Rheem / CET BTM HEMS orchestrated homes/sites.

Example 1 – Customer financial impact

A new Rheem / CET customer purchased a smart water heater and a BTM home energy management system (HEMS). They also have an existing proprietary battery energy storage system (BESS) with cloud only control. Further, they are on a time of use (TOU) tariff with their retailer. The customer asked Rheem / CET to optimise their battery along with their smart water heater and solar PV. However when CET advised this was not

possible due to the proprietary nature/independent control of the BESS, the customer became upset and said, "they were never told this when they purchased the battery".

The negative effect on this site (validated via CET power metering and site logging) means other open devices under site HEMS control (i.e. the smart water heater and pool pump), that the HEMS would usually share excess solar PV with, "fight" with the battery system. As the battery cannot be controlled or optimised for site conditions it "takes" the solar PV when the HEMS would have directed power elsewhere based on solar production, energy efficiency, tariff arbitrage, consumer need and forward-looking energy usage predictions. The end result is a financial loss for the consumer. The solar PV energy is not optimised, the battery discharges unnecessarily into loads that could have used solar PV energy directly and the battery is not available to supplement peak tariff power. As a result, loads such as the smart water heater are often forced to take power from the grid during peak periods.

CET has empirical data from their consumer sites showing an average daily loss of $2 to $3 per site.

Example 2 – Impacts to grid security of supply

As touched on in the "Customer example above" many consumers with batteries (via their retailer) have been enrolled in battery VPP's (Virtual Power Plants) which are the aggregated control of proprietary battery energy storage systems (BESS) across many hundreds of consumer sites. Most consumers would struggle to understand exactly what they have signed up for. Rheem / CET and others see the biggest issue when CER under HEMS control tries to operate on the same site as a proprietary battery energy storage system in a VPP. Without getting too technical a typical scenario is the battery in delivering an FCAS service reacts to a dip in grid frequency by discharging. The site HEMS, which has no control or monitoring of the proprietary battery energy storage system (as there is no interoperability support) sees an excess flow of energy (export) which it attributes to excess solar PV, so the HEMS reacts by turning on load, thus negating the battery action to support grid security of supply (in this case an FCAS frequency raise). This adverse grid impact on CER providing such services as FCAS is silently growing as consumers add smart CER to their homes under local HEMS control. The converse is also true where other site CER is enrolled in a VPP and the proprietary battery reacts to counter the HEMS/CER action. Interoperability would solve this problem for both the consumer and the grid, ensuring predictability and firmness in providing grid services for BTM aggregated CER resources, while "*a second settlement point at a single connection point*" may cause even further issues beyond the current issues described. (Refer also to our answers to Questions 2 and 3)

Any rule change must eliminate the above situation(s).

3. ***What would be the appropriate framework for approving and verifying alternative measuring devices permitted to be used at the second settlement point?***

While we support sub-metering of separate CER for the purposes of a single FRMP providing some more innovative tariff arrangements under a single bill, we do not support the proposal for a second settlement point for residential customers.

4. ***What would the implementation costs be for creating second settlement points with associated metering configuration options?***

Again, please refer to our Answers to Questions 2 and 3 as there are obvious direct costs but it is the consequential hidden costs (technical, physical, and commercial) being consumer lock-in costs that need to be carefully looked at. We have provided potential remedies to mitigate some of the issues surrounding consumer lock-in (see Q2 and Q3 answers) which include CER local interoperability and open interoperable sub-metering. However, there is also the issue of physical wiring changes to contend with and any wiring changes should not pose an additional burden on the consumer should they wish to change their CER arrangements and the additional risk of consumer lock-in. Accordingly, for a single FRMP, this may be better addressed through virtual netting of the metering arrangements for billing reconciliation purposes. However for control/orchestration purposes across the whole site, real-time access to power data and control elements (interoperability) in any metering at the site would also be required to ensure that a consumer is not restricted as to how and with whom they seek to orchestrate and control their CER assets be it for local financial gain and/or grid services. Further, there needs to be commercial neutrality in access to site metering such that market competition in controlling CER assets is encouraged and any one entity (MC, FRMP) does not hold a privileged position of access and control to metering assets used in the control of CER.

Assuming interoperability and open, interoperable sub-metering is a prerequisite for creating a second settlement point, the physical wiring issue must be addressed. We believe there should be no changes to physical wiring that lock-in a consumer's CER Asset(s) or sub-metering to a particular FRMP. Using CER asset-level open metering, then virtual power accounting can be implemented which gives the consumer a cost-effective mechanism to assess, compare, and take up competitive market offers with ease of churn, for the monetisation of their CER asset(s) without physical reconfiguration costs of their CER assets such as physical wiring changes and the stranding of CER assets due to their proprietary nature.

QUESTION 4: USING OTHER DEVICES FOR CER MEASUREMENT AND REWARD

What changes to the rules, if any, should be assessed in relation to these non-market-related devices for CER products and services to consumers?

As noted, while we support sub-metering of separate CER for the purposes of a single FRMP providing some more innovative tariff arrangements under a single bill, we do not support the proposal for a second settlement point for residential customers. Further, any sub-metering must be an "open access" platform for all functionality of the meter to ensure consumers can churn their CER assets and sub-metering to another provider, and further CER assets without stranding existing assets or metering. This requires "interoperability" of both metering and CER assets.

QUESTION 5: ESTABLISHING TWO CONNECTION POINTS AT A SINGLE PREMISES

1. ***Are there any changes we could make to the NER and NERR to assist in overcoming the current barriers to the second connection point?***

As noted, we have concerns about residential consumers understanding the implications of a second connection point. We would suggest that considerable consumer protections are required before it can be considered. This includes guarantees that this does not lock-in a customer to a single provider.

2. ***What issues need to be considered in evaluating whether there should be changes to the fixed network tariff for second connection points at the same premises? How (if at all) should this issue be addressed in the NER?***

This issue has been recognised as a key reason for not supporting a second connection point. We are unaware of any allocation of network costs that would not cause potential customer issues.

QUESTION 6: AEMO'S SPECIFIC FTM2 FOR SMALL CUSTOMERS

Do you agree with the Commission's view and its initial position to not progress further with AEMO's specific FTM2 for small customers?

YES

QUESTION 7: AEMO'S FTM2 PROPOSAL FOR LARGE CUSTOMERS

Do you agree that introducing AEMO's FTM2 (or variations to it) for large customers would create an additional or better option for large customers to engage with multiple service providers?

YES – with consideration of suitable consumer protection to prevent lock-in to a single provider.

QUESTION 8: MULTIPLE FRMPS: EMBEDDED NETWORKS MODEL

Other than metering and network connection costs, are there other reasons SGAs use the embedded network framework?

No comment

Would the proposed changes to network tariffs in NSW and Tasmania drive SGAs in those states to adopt different models?

No comment

Do stakeholders consider that the existing embedded network framework should continue to be used to facilitate flexible trading and market participation or should the Commission consider alternative models/framework?

No comment

Are there any additional issues with the use of the embedded networks framework to facilitate flexible trading not already discussed above?

No comment

QUESTION 9: MULTIPLE FRMPS: AEMO'S FTM2 PROPOSAL

If the Commission introduced FTM2, how would (or should) it affect the existing arrangements that allow forms of flexible trading, such as SGA, embedded networks, and wholesale demand response?

Moving forward local standards-based interoperability and access to all functionality for both metering and CER assets is a pre-requisite to assessing the viability of the embedded network framework in the orchestration of behind the meter BTM CER assets under FTM2.

Would introducing AEMO's FTM2 model for multiple energy service providers significantly impact the business model or costs of the primary energy service provider?

No comment

Would FTM2 encourage distributors to test and implement new tariffs (e.g. dynamic) for sizable and responsive loads more readily than they have to date? Would FTM2 affect the way in which energy service providers (such as aggregators) provide network services?

No comment

Are there any costs or benefits that we have not considered in relation to AEMO's FTM2 proposal?

No comment

QUESTION 10: OPPORTUNITIES AND BENEFITS OF IMPROVING EXISTING ARRANGEMENTS

• ***Do stakeholders consider there are other matters that the Commission should consider in terms of the opportunities, benefits, and costs for improving existing arrangements for the measurement of street lighting and public furniture?***

Harmonising of metering specifications for street lighting with any specification for sub-metering would make sense to ensure a more viable and competitive marketplace for Australian meter manufacturers.

QUESTION 11: MARKET FUNCTIONS AND OBLIGATIONS - METERING ROLES

• ***Should there be another level of accreditation for Meter Providers in the NER?***

Yes, please see our answers to Q12 below.

• ***What are stakeholders' views on distributors performing the functions of the MC, MP and MDP for the street lighting and other street furniture they manage, if MEFM is introduced?***

No comment

• For street furniture not managed by distributors, should the existing competitive framework for metering parties apply if MEFM is introduced?

No comment

QUESTION 12: TECHNICAL REQUIREMENTS

• Do stakeholders have views on the removal or amendment of minimum service specifications for minor energy flow meters?

The minimum services specification defined in NER schedule 7.5 is inappropriate for minor energy flow meters. For example, the minimum service specifications include remote disconnection/reconnection of the customer's premises, the provision of a display, and onerous interval data storage requirements inconsistent with a low-cost, connected metering solution.

• Do stakeholders have views on inspection and testing requirements for minor energy flow meters?

Inspection and testing requirements for minor energy flow meters should be less onerous than for primary meters and focus on minimising total lifetime costs for installed equipment. For example, extending testing intervals, relaxing field-testing accuracy requirements, enabling the use of remotely accessed and stored readings for testing and permitting equipment testing by qualified technicians not associated with a MC.

QUESTION 13: IMPLEMENTATION AND TRANSITION

• Are there any other implementation or transitional issues we should consider for this aspect of the rule change?

Yes, our answers to Questions 2 & 3 detail the prerequisites to ensure that consumers are not locked-in. Consumers must be able to leverage the most out of their CER asset(s) and monetise their CER asset(s) with the energy market service provider of their own choosing.

For any rule change to deliver the best outcomes for both consumers and grid security of supply, the issues we have raised (with proposed solutions) or answers to questions 2 & 3 must be addressed. Failure to address the issues raised will result in an environment where consumer lock-in will accelerate and be costly for the consumers to exit such arrangements.

Summarising the proposed prerequisite solutions:

1) To mitigate technical and commercial CER lock-in all CER must support local interoperability. As detailed previously a solution exists now due to the developments in the US market where there has been a shift in US regulations to recognise local BTM interoperability as a mandatory requirement of inverter-based CER (Solar PV and Consumer battery energy storage systems (BESS). Australia can leverage those changes locally to provide better consumer and grid outcomes. California is the dominant US market for Solar PV and consumer battery energy storage systems, and the California Energy Commission (CEC) Solar Equipment Certification List details certifications to date for UL 1741 SB, which now calls up mandatory local interoperability compliance via IEEE1547-2018. Clause 10 of the IEEE1547-2018 standard defines the required physical interface and open protocols that inverter-based generation systems must support. However, whilst many manufacturers have embraced, are delivering, and promoting this interoperability capability to the

Australian market, several battery manufacturers have software disabled this local interoperability capability for battery storage systems delivered to Australia to the detriment of consumers and grid security of supply. We believe this is inconsistent with the NEO. Noting this "lock out" can be reversed by an over-the-air software update so the problem is not technical.

2) A consumer's CER assets can access all site resources (e.g. solar PV) without undoing physical wiring changes from another provider that has locked them in. For example, a proprietary battery asset and the site solar wired in under a separate circuit with a proprietary sub / secondary meter such that a new CER asset(s) cannot utilise the solar PV nor control / access the proprietary CER and Metering assets. The consumer is then locked-in technically (no interoperability), physically (wiring), and likely commercially (no open access to control the proprietary assets).

3) Any sub / secondary metering as detailed in 2) above must be open and interoperable with all functionalities that could reasonably be utilised competitively and must be accessible to any energy market service provider that the consumer wishes to select to monetise their CER asset(s).