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07 November 2024

Australian Energy Market Commission
Level 15, 60 Castlereagh Street
Sydney NSW 2000

Submitted online at: https://www.aemc.gov.au/rule-changes/real-time-data-consumers

Response to AEMC Consultation Paper – ERC0399
National Electricity Amendment (real-time data for consumers) Rule
National Energy Retail Amendment (Real-time data for consumers) Rule

Dear AEMC Team,

Thank you for the opportunity to comment on the AEMC Consultation Paper - "Real-time Data for Consumers".
This response is a joint response on behalf of both Rheem Australia Pty Ltd (RAPL) and Combined Energy Technologies Pty Ltd (CET), as we have a complementary interest in the AEMC's consultation paper.

Our views, concerns and recommendations as outlined below, draw from our extensive experience across our fleet of thousands of residential and commercial mixed CER sites we have deployed across the NEM and WEM, whereby orchestration of these mixed CER sites is to the benefit of consumers, to enhance grid security of supply, and to support and accelerate the hosting of renewables on the grid.

All of our sites required the installation of our own Class 1 meter (developed by CET) to provide real-time, "instantaneous" meter data, including voltage, current, power factor, reactive and active power, in the provision of HEMs and grid services. We use our site/home metering for services including:

- compliance with DNSP-mandated dynamic connections.
- consumer HEMS CER orchestration.
- DNSP minimum and peak demand abatement services via aggregated CER, and
- FCAS services for grid security of supply.

The installation of our own Class 1 meter could have been avoided at thousands of sites, and it can also be avoided at future installations if we have local access to metering data—including real-time data—on a technically and commercially neutral basis. Such access would simplify the market for metering installation. The caveat to this is that all participants obtain the consumer's permission as the owner of that data.

As installation of a parallel Class 1 meter can cost up to $1200 per site, this is an impediment to the broader uptake of CER as it limits the accessibility of CER technology to those who can afford it. This impediment limits the uptake and control of CER for the above services and is impacting the transition to a two-way grid and the transition to net zero. Rule changes to enable access to metering data locally, including real-time data, will realise significant cost savings (estimated to be 10's of millions of dollars over the coming years) and provide significant benefits to both consumers and the grid whilst also enhancing network security of supply.

We have elaborated further on the above in our response to the consultation questions.

As the largest Australian manufacturer of water heaters, Rheem markets a wide range of solar, heat pump, high-efficiency gas and electric water heater models to the domestic water heating market. Our brands include Rheem, Solahart, Vulcan and Aquamax. Additionally, we are now the number three supplier of photo voltaic (PV) systems in the country via our Solahart channel. Today, Rheem has products in over 4 million Australian homes. Over the last eight years, we have also commenced the manufacturing and installation of smart electric water heaters with inbuilt metering, which can be orchestrated locally with other CER via Combined Energy Technologies Pty Ltd.'s (CET's) HEMs and in aggregation controlled remotely by CET cloud platform for grid services.

CET is an Australian technology company specialising in energy management for residential, commercial, and microgrid systems. CET systems utilise CET's local Energy Management Gateway to provide secure communications and local orchestration for a wide range of CER devices and CER manufacturers. Local orchestration of CER devices is achieved through a suite of CET Energy Management modules that provide cost-effective Class 1 power metering, communications, and CER control. CET has extensive experience in the integration and orchestration of systems with multiple CER devices, including the integration of solar PV, batteries, water heating, electric vehicle chargers, pool pumps and A/C for the benefit of the residential consumer, retailers, DNSPs, and the grid.

Together, Rheem and CET have been actively participating in the emerging orchestrated CER market for nearly 12 years with thousands of cloud-connected, mixed, orchestrated CER sites (Solar PV, batteries, smart water heaters, HVAC, pool pumps, EV chargers, and other CER) across the NEM and the WEM. Over the past 12 years, we have identified and resolved many issues (at live field sites) associated with how 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. Our observations, concerns and comments in this response to the consultation paper are supported by empirical data from our existing fleet of thousands of NEM and WEM consumer and commercial sites of mixed CER. The data from these sites support our technical and commercial conclusions that align with the National Electricity Objective (NEO) principles.

The Consultation Paper for "Real-time Data for Consumers"

The consultation has identified three core issues that constrain access to real-time data:

1. ***cost —*** *consumers or their representatives must install and pay for separate devices to access real-time data [separate] from the smart meter. This may be inefficient because the smart meter may provide the data at a lower cost. [note: there is currently no local access to smart meter data]*
2. ***challenges with commercial negotiation —*** *consumers' authorised representatives have not been able to negotiate access to real-time data with metering parties on fair and reasonable terms.*
3. ***latency of alternatives —*** *currently, consumers may receive smart meter data at a lag, which can limit the utility of having the information.*

We agree that the above issues must be resolved, and we have addressed these issues in our response.

However, these are not the only issues to be resolved to ensure that any rule change to enable consumer access to metering data locally, including real-time data, provides a technically and

commercially neutral environment for the provision of CER services with the metering installation as the enabler of CER products and services and not a competitor to providers of CER products and services.

As such, we strongly encourage the AEMC to ensure that the metering installation is restricted to settlement, billing, maintenance, and the provision of data, including local real-time data. This will facilitate a choice for consumers of CER products, services, and service providers (on or Off-Market) on a commercially and technically neutral basis as an enabler of CER products and services (through the provision of local data, including real-time data), ensuring a competitive, innovative, market for consumers.
The metering installation should not compete with the industry nor be used to lock-in consumers to Retailer products and services embedded in/attached to the metering installation. It should not only be accessible to the MC/MDP/MP. All CER products and services should reside outside the metering installation.
We believe any draft rule that is an outcome of the consultation paper must address more than just providing real-time data for consumers as we have detailed above. Unless this is achieved, the industry will see a new monopoly market for the MC/MDP/MPs, enabled by the NER that protects their privileged access to the metering installation, thus protecting unregulated products and services being built into the metering installation, further enabling an anti-competitive environment and monopoly suppliers.

Summarising the anti-competitive "metering installation" environment that is evolving under the NER

- As the MC/MDP/MP has privileged access to the metering platform, they can develop/embed products and services within the metering platform, thus creating a market distortion, impacting the ability of off-market Energy Market Service Providers to compete in the market for CER products and services.
- Further enabled by the CER benefits rule change, the NER currently has no restrictions on an MC/MDP/MP creating tightly integrated CER products with on-market metering, including CER such as batteries, EV chargers, water heaters, pool pumps and other CER through leverage of their privileged access to the metering installation. The creation of these new unregulated products and services within the metering platform is only possible through the NER's current protection.
- Under the recent CER benefits rule change, protected by the NER, the MC/MDP/MP would assume sole operational access rights to sub-metered residential CER. As the MC would take operational control of a sub-meter and hence the associated CER, this will disrupt HEMs orchestration services at the site and will impact Off-Market grid services such as DR and Dynamic Connection compliance as the off-market service provider no longer has access/control rights to the on-market sub-meter/CER device.
- As is already evidenced in retailer supply contracts, we have seen the provision of energy to a consumer being tied to "handing over" rights to the MC/MDP/MP (via the retailer) for their discretionary control in switching any controlled load circuit. This locks the consumer in, with no choice in who controls their CER.
- There is steady growth in DNSP dynamic connection services (import/export limits) being mandated by DNSPs under their residential connection agreements. Currently, the connectivity to DNSP DERMS via the CSIP-AUS protocol is provided by a myriad of certified off-market energy market service providers that ensure site compliance with a dynamic connection. An MC/MDP/MP taking operational control of CER from the metering installation is not contestable by the market as only the MC/MDP/MP can access the metering installation, and as there can only be one CSIP-AUS connection per site, and with the retailer taking control

of CER (as a condition of energy supply) this eliminates all Off-Market service provider competition. This raises many legal, anti-competitive, DNSP compliance, and regulatory issues.

- The provision of cloud services for the aggregated control of CER is also severely affected as the MC/MDP/MP can use their cloud and the regulated communications to the metering installation as the control and command path for consumer CER integrated with, or attached to, on market metering, again precluding competition as only the MC/MDP/MP can access the metering installation either locally or remotely and only the MC/MDP/MP can access the regulated communications pathway to the metering installation.

Any rule change must define both "data/ real-time data provision" and "metering installation" limits

Any rule change giving consumers (and their authorised representative) access locally to metering data, including real-time data, must also address the above issues. Product manufacturers and off-market energy market service providers cannot access the evolving market that the MC/MDP/MPs are creating for themselves using on-market metering installation only they can access. This regulatory loophole or market failure creates uncertainty and precludes other suppliers of CER products and services from entering the market. Competitive service offerings, combined with a wide choice of CER products, are needed to drive down consumer prices.

If these issues are not resolved, innovation and open market competition for off-market CER products and services behind the meter, including HEMS, DNSP DR, and DNSP Dynamic Connections, along with competition in the supply of aggregated CER grid services by non-FRMP participants will be severely compromised, resulting in consumer lock-in and competition lockout that will eventually destroy the off-market Energy Market Service Provider ecosystem.

The cost/ROI case for the provision of real-time data

The growing need for local real-time data, in many cases, is due to mandates by DNSPs for export/import connection compliance, which needs to be considered when allocating costs. The need for local real-time meter data is no longer a question of choice by the consumer but is increasingly becoming a requirement. DNSPs are mandating dynamic connection import/export control compliance for solar PV exports and, most recently, for import control of EV chargers (Energy QLD). These dynamic connections provide cost savings to networks through constraint mitigation (such as minimum and peak demand abatement) and network augmentation deferral, and they support AEMO grid security of supply. Consumers are consequently required to install parallel class 1 metering to supply the real-time power flow data for site compliance by CER under CSIP-AUS control algorithms. Access locally to smart meter real-time data would significantly reduce compliance costs for consumers, eliminating the need to install additional, parallel Class 1 metering at the connection point.

Note that as the meter data belongs to the consumer, local access to meter data, including real-time data, should be free to the consumer or their assigned agent.

Summary of recommendations

1. Consumers, along with their authorised representatives, should have free local access to metering data, including real-time information from the metering installation.
2. The National Electricity Rules (NER) should clearly state that the "metering installation" can only be used for the primary purposes of settlement, billing, maintenance, and the provision of metering data—both remote and local—as authorised by the consumer.

3. Additional services must be located outside the “metering installation” to ensure a robust competitive environment for Consumer Energy Resource (CER) products and services.
4. The “metering installation” is intended to be a commercially and technically neutral facilitator of CER products and services, not a competitor to those providers.

As this submission has been prepared using the expertise of several Rheem and CET personnel, I would ask that any enquiries related to the submission be directed to the contact(s) below in the first instance. If required, we 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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Response to Consultation Questions

Question 1: What are the benefits of improving access to real-time data?

a) What are the anticipated use cases of real-time data?

Consumers/industry are currently required to install parallel (to the connection point metering installation) metering which duplicates the connection point smart meter to provide local meter data. This data includes energy data and real-time data to enable services delivered by on/off-market services providers, including:

- Many thousands of site/home Energy Management Systems (EMS/HEMS) that control and orchestrate CER using real-time connection point power flow data (including voltage, current, power factor, and real and reactive power, from installed parallel metering) to optimise solar self-consumption, for load shifting through tariff arbitrage, to adjust CER (load and generation) for peak demand abatement due to demand based tariffs and other applications.
- For use by site/home CER control systems that enable compliance with DNSP solar backstop and dynamic connections (real-time dynamic import/export limits) for DNSP grid constraint mitigation and AEMO security of supply.
- For off-market services such as the aggregation/orchestration of consumer CER for minimum and peak demand abatement for DNSP constraint mitigation.
- For AEMO grid security of supply services such as by FCAS service providers that use consumer CER in a VPP.
  Note that the above services may not be provided by the consumer retailer.

To remove the need for parallel metering, real-time data (RTD) via local access to the metering installation must be of a sufficient type, accuracy, and frequency to enable a wide range of consumer services, including those detailed above. We have included our definition of the requirement for real-time data within this response.

b) What is the value of the benefits that flow to consumers?

Most standalone solar PV systems, all battery systems, and all HEM systems are deployed with parallel metering for real-time monitoring, orchestration, and control of CER. According to a report from the Energy Council for the first half of 2024, the total number of businesses and households with solar has surpassed 3.8 million. In recent years, most installations have included a parallel connection point meter to provide consumers with real-time information on power flow, including site power export.

With the rapid growth of CER and related services, many sites now have multiple parallel connection point meters, each proprietary and associated with different CERs such as solar PV, batteries, and water heaters. The costs incurred by consumers so far, largely due to the lack of local access to the connection point smart meter for real-time data, are estimated to be tens of millions of dollars. Continuing these costs could be significantly reduced if real-time data were accessible locally from the metering installation. Access to meter data, particularly real-time data from smart meters, often eliminates the need for an additional parallel Class 1 meter at the connection point. This extra meter, which can cost consumers between $500 and $1,200 to install, poses a barrier to the broader adoption of consumer CER by limiting access to this technology to those consumers who can afford it. This cost related barrier restricts the uptake and management of CER services and also hinders the transition to a two-way grid, which is essential for achieving net-zero emissions. Ensuring the metering installation is restricted to settlement, billing, maintenance, and the provision of data locally will enable a choice of products, services, and service providers (on/off-market) on a commercially and technically neutral basis. The

metering installation should be a technically and commercially neutral enabler of CER products and services through the provision of local data, including real-time data, to ensure a competitive industry for consumers in the delivery of services and outcomes, including:

- **Optimising solar self-consumption:** benefits consumers and provides grid minimum demand abatement.
- **No consumer lock-in:** consumers should not be locked into retailer products and services as provided by the MC/MDP/MP due to their current privileged access/use of the metering platform for products and services other than settlement, billing and maintenance.
- **No retailer lock-in:** retailers would not be locked into MC/MDP/MP CER services that exclusively use/reside on the metering installation or clouds that connect (via the regulated metering remote communications – e.g. 4G) due to current oversight in the NER that enables this.
- **Consumer choice:** the consumer should be able to authorise local (and remote) access for the use of their metering data, including real-time data, in providing CER products and services by the energy market service provider of their choosing.
- **Cost of CER implementation:** a significant reduction in the cost of BTM CER orchestration as duplicate connection point metering will be eliminated.
- **Cost of DNSP mandated Backstop and CSIP-AUS dynamic connection compliance:** a reduction in cost associated with complying with mandated DNSP dynamic connections (export/import limitations) as the requirement to duplicate connection point metering will be eliminated.
- **Cost of participation in grid services:** a reduction in the costs of participating in grid services such as a VPP or an off-market service provider using aggregated CER for DNSP minimum and peak demand abatement as, again, duplicate connection point metering will be eliminated.
- **Wider consumer participation in CER:** availability of CER benefits to broader socio-economic groups due to a reduction in the need to install parallel connection point class 1 metering, in many cases there being multiple proprietary meters at a site for different CER (Solar System Meter, Battery System Meter, HEMs system meter, grid services meter, CSIP-AUS compliance meter etc) which can be eliminated.

Using smart meter installations as a primary source for site metering allows for efficient access to local meter data, including real-time data (with a minimum frequency of access of 1 Hz) and interval accumulation data. This approach has the potential to save the industry and consumers tens of millions of dollars in the coming years. Currently, the installation costs for a parallel Class 1 meter on sites range from $500 to $1,200, with some respondents to the metering review reporting even higher costs. These costs depend on factors such as the number of phases, available switchboard space, and the complexity of the installation.

Question 2: What are the costs of improving access to real-time data?

a) What are the types of costs that would be incurred to improve access?

Access must be technically and commercially neutral and not require specialist intervention such as a level 2 accredited service provider to expose communications connectivity locally at the metering installation. Metering already deployed will have different costs associated with local access enablement to meter data as opposed to future metering, which may be subject to a new minimum services specification that results from this consultation.

Costs may include:

- Changes to the physical construction of meters, for instance, to expose communications ports and/or provide access to communications modules that support standardised connectivity options such as Ethernet TCP/IP, RS485, and Wi-Fi.
- The supply and installation of communications modules to enable multi-user access to meter data for target meters already deployed.
- Updates to software to support interoperability using standardised protocols and data structures within the metering platform. In the case of already deployed metering, such updates could be applied remotely.
- Any software updates must address cyber security/access to the metering platform by the consumer and/or their authorised representative. We have suggested looking at DNSPs recent adoption of CSIP-AUS for CER control as required for dynamic connection import/export limits. We have provided further details in our answers to Question 6.
- A regulatory framework that enables access and clearly defines the roles and responsibilities of all parties and includes a robust dispute resolution mechanism.

The costs mentioned should be compared to the existing expenses incurred by consumers and industries due to mandatory compliance, such as installing parallel Class 1 connection point metering from lack of local access to the metering platform. Considering these costs along with the potential benefits of local and real-time access to meter data, it's evident that the advantages far outweigh the costs of improving access.

b) What is the magnitude of these costs?

We are not able to estimate actual costs for other providers' products, such as metering supplied by metering providers. That said, we believe that the systems and processes would already be in place to manage software maintenance of the metering platform and costs for the software at least would include development and support for software that supports interoperability and a secure access framework. As we have detailed in our response, most smart meters support standards-based communications locally, such as DLMS and/or Modbus, for access to meter data, including real-time data, locally via their communications ports. These ports, however, are typically behind plastic covers with a level 2 ASP seal.

As embedded network operators routinely access the embedded metering installations for meter data, including real-time data, the capability already exists, standardisation however of protocols, security of data and local access environment, along with a suggested compliance certification framework, is required. Again, we have provided further details in our response, including how the existing DNSP framework for the interoperability and certification of CSIP-AUS devices/software (used by DNSP Demand Management Servers to communicate with site/home CER mandated under DNSP dynamic connections for import/export limit compliance) can be leveraged as the basis of a framework for accessing metering installation data locally, including real-time data.

CET currently designs and develops Class 1 - 6 channel metering that is locally accessible and supports Modbus communications. In our view any additional costs associated with modifying existing meters that already support a communications interface and standards-based software to provide a standardised framework for the required physical access and software interoperability locally at the smart meter is not an extensive nor costly undertaking. We would be happy to have further discussions with the AEMC regarding costs as required.

c) Who would incur these costs?

Firstly, we must clearly understand the costs involved, the data provided, and how that data is made available.

- **Local data -** The costs associated with providing data locally, including real-time data, at the metering installation, with any historical data being cached by CER devices external to the installation. That is, there are minimal costs/changes to the metering installation software beyond the provisioning of software to support interoperable data access and a required access/security framework. Please also see our answer to Q6. Data, including real-time data, is already available from metering installations, as a quick search of meter specifications will reveal. Additional costs associated with the installation of metering systems that provide local data include the need for easy physical access to metering ports. To enable multi-user access at the customer site, a communications module must be connected to the meter data port. These communication ports are typically covered by a plastic seal with Level 2 ASP protection, which creates access issues for existing meters. For new meters, this challenge should be addressed through the minimum services specification. We recommend seeking independent advice to identify and estimate solutions to these problems.
- **Remote data -** Any costs related to providing data remotely beyond what retailers already offer should be noted. Currently, metering installations supply data to retailers for consumer applications that provide historical energy usage information and delayed kilowatt (kW) power data. It is important to emphasise that this delayed kW power data is not real-time data and is not useful for the local control functionality described in our response.

As we have detailed in our answers elsewhere in this response, the benefits of access to meter data locally, including real-time data, flow not only to consumers but also to DNSPs and AMEO. Briefly, some use case benefits realised by the installation of parallel Class 1 connection point metering for access to real-time data include:

- Optimising home solar self-consumption. The benefits flow:
    - To the consumer => greater self-consumption = greater savings
    - To the DNSP = > greater self-consumption = a mitigation of minimum demand issues, network work investment deferral and other benefits
- Maintaining site dynamic connection compliance with DNSP-issued import/export limits. The benefits flow to:
    - To the DNSP => an ability to mitigate minimum and peak demand issues via the remote control of consumer CER for constraint mitigation and network work investment deferral supporting grid/system security of supply.
    - To AEMO supporting grid/system security of supply.

Note that DNSP-mandated site dynamic connections require real-time connection point data to calculate instantaneous power flow. This requires consumers to invest in parallel Class 1 metering technology and "forever" costs to maintain DNSP demand management server connectivity. Throughout our response, we have given further details of this use of real-time data.

Other examples beyond the two given above can be found within our response.

As detailed throughout our response, we believe the benefits far outweigh the costs of implementing local access for the consumer to the consumer's own meter data, including real-time data from the metering installation.

Further, given that the MC/MDP/MPs are building extensive CER control functionality and software into ever more powerful meters at the expense of consumers and industry competition due to "loopholes"

In the NER, if the metering installation is explicitly limited to its intended functions of settlement, billing, and maintenance, the cost of smart meters will significantly decrease. All custom features integrated into the metering platform, such as energy management software and additional relays and communication modules for direct control of CER, would instead be located outside the metering installation. This approach would allow consumers to choose only those products and services that interest them from a competitive market of innovative CER offerings. The metering installation would then serve as a technically and commercially neutral enabler for CER products and services, rather than competing with them. This would give consumers the freedom to select the energy market service provider they wish to use to monetise their CER assets, which may or may not be the Financially Responsible Market Participant (FRMP) for their home.

d) Do the benefits of improving access to real-time data outweigh the costs?

As detailed previously, the benefits will far outweigh the costs. With the explosion in CER/CER services many sites now have multiple parallel connection point meters all proprietary in nature associated with each CER (solar PV, battery, water heater etc). The costs to date to consumers (due to lack of local access to the connection point smart meter for data including real-time data) is estimated to be many 10's of millions of dollars. Continuation of these costs to consumers would be largely eliminated if data including real-time data was available locally from the metering installation.

Such access to data including real-time data locally from the smart meter will preclude (in the majority of cases) the current requirement to add one or more parallel class 1 meters at the connection point - a significant cost to consumers ($500 - $1200 installed – phases, switchboard condition and site dependent) which is an impediment to the wider uptake of CER as it limits the accessibility of CER technology to a wider socio economic group. This access/cost impediment limiting the uptake and control of CER for the above services is impacting the transition to a two-way grid and hence the transition to net zero.

Any costs associated with changes to the metering installation to provide access to metering data, in particular local metering data including real-time data, should be weighed against the existing costs to consumers, including costs associated with metering for mandatory DNSP requirements such as export/import connection point dynamic limit compliance which requires access to local real-time connection point power flow information. Parallel metering costs, opportunity costs, competition in CER products and services along with industry wide benefits that could be achieved (as detailed previously) by realising local access to meter data including real-time data need to be all considered. In taking such a view, this list of benefits far outweighs any costs of "improving [local] access to real-time data".

Question 3: Do metering parties currently have a competitive advantage?

a) Do you agree with the proponent that metering parties have a competitive advantage in providing services not related to their core functions of settlement, billing and maintenance?

Yes:

We are aware of MC/MDP/MPs using/developing the meter platform/metering installation to carry out CER control for a range of commercial services, including loading bespoke software for the purposes of CER orchestration/energy management onto the metering installation. This includes CER being attached to the meter, bespoke software being loaded onto the metering platform and the integration of on-market metering with CER products that only they can access using their privileged access rights under the NER. These issues extend to the metering installation communications (the remote two-way

communications to the meter that enables settlement, billing and maintenance) which is also being used to communicate between their cloud and site/home CER, with the "sunk costs" of the metering installation being a competitive advantage for their commercial strategies at the expense of market competition and consumer choice.

Hence the metering installation serves monopoly commercial strategies at the expense of the consumer, industry competition, and innovation in the CER products and services space. This will cause both consumer and retailer to "lock-in" as there is no ability for a consumer's nominated energy market service provider to load their software on the metering platform and/or take control of CER that is controlled by/attached to the meter. Controlled load is an obvious CER that has no current competitive access possible for the consumer to nominate another service provider (e.g. a non-FRMP) to provide CER control services of the consumer-controlled load circuit (or other I/O) circuit to the consumer benefit in competition with their retailer/the MC/MDP/MP. This issue extends to the MC/MDP/MP cloud, which orchestrates the CER control, e.g. for retailer wholesale hedging with no choice or transparency afforded to the consumer. Again, as the path of control is via the metering installation remote communications (e.g. 4/5G) and the metering installation itself, competition in providing such services is currently impossible. Resolution of this market distortion is required in parallel with consumer-assigned access to local metering data, including local real-time data if the market is to be truly competitive.

Either the metering platform becomes fully accessible/interoperable with all services contestable, or it is restricted to settlement, billing, maintenance and the provision of metering data, including local real-time data. The latter, being the preferred "Clean", easier to implement and police option.

b) How would any competitive advantage impact the costs of new energy services to consumers?

If an MC/MDP/MP has privileged access to the metering installation and can develop CER products and services on the metering platform, such as CER energy management software, dynamic import/export control services, VPP control, and other on and Off-Market services such as CER control for hedging and demand response, all without any competitive access to the metering platform (as this currently cannot be assigned by the consumer), then there is no consumer choice in who uses the metering platform for the purposes of CER control, hence market competition and innovation will be severely restricted with the consumer (and retailer) locked into only products and services offered by MC/MDP/MP who can leverage their position due to sunk costs of the metering platform that are not available to other energy market service providers in the provision of CER products and services.

Noting also that CER products and services require data to inform and control CER and that data belongs to the consumer. To that extent, we have seen a disturbing trend whereby some consumer retailer energy contracts have an embedded clause whereby the supply of energy is predicated on the consumer releasing control rights of the consumer's CER, such as CER on a controlled load circuit to the retailer. As it is the metering installation that carries out the CER control, it is the MC/MDP/MP that has control of the consumer CER under a commercial contract with the retailer. In this instance it is both the retailer and the consumer that is locked into the arrangement. The consumer should have rights to control of their CER/meter data that cannot be nullified as a condition of their energy supply.

Question 4: Do DNSPs need more than PQD to improve network planning and operation?

This question is for DNSPs to answer.

Noting that as a HEMs/grid services provider, we currently use our own parallel connection point Class 1 metering, which also collects/archives connection point information, including time-stamped voltage, current, power factor, reactive power and active power. This data is rolled up and archived in five-minute intervals, with each interval retaining the minimum, maximum, and average interval data. This data is archived indefinitely in the cloud and retained on-site (via our energy management gateway) for at least 180 days to accommodate internet outages.

a) Do the benefits of improving DNSP access to real-time data outweigh the costs?

This question should be considered separately (by DNSPs) in the case of consumer local access to meter data, including real-time data. Our response has comprehensively addressed the consumer case.

b) What are the use cases for DNSPs and other network planners to have access to real-time data other than advanced PQD?

This question is for DNSPs to answer.

Question 5: Who should have a right to real-time data in the NER?

a) Should consumers, their authorised representatives or any other party, including DNSPs, have a right to access real-time data?

It is the consumer's meter data, including the real-time data that is created due to the consumer's import/export of electricity (e.g. by their use/control of their CER) hence, other than for the purposes of settlement and billing, it should be at the consumer's consent as to who has access to their meter data including real-time (local) data. Sharing of the consumer meter data at no cost to the DNSPs (considering the provisions of the privacy act) for network constraint mitigation, network planning, grid security of supply and other non-competitive (to providers of CER products and services, etc) purposes should be considered.

Question 6: How should real-time data be defined?

a) Do stakeholders agree with the proposed definition of real-time data and customer power data?

No: 300-second resolution is not (sufficient for) real-time data.

Real-time data must be of a type, accuracy, and frequency to enable a wide range of consumer and grid services, as detailed previously. Off-market service providers currently calculate sub-second power flow updates from their own connection point parallel class 1 metering using instantaneous (at no less resolution than once per second - 1 Hz) readings of voltage, current, power factor, reactive/active power as inputs to control algorithms in the provision of consumer and grid services such as:

- Real-time HEMS orchestration, including solar PV self-consumption of CER (variable power batteries, smart water heating, EV charging, V2G, etc) for consumer financial benefits.
- Real-time control of CER to comply with solar backstop and dynamic import/export limits as required by various DNSPs across the NEM for grid constraint mitigation/security of supply.
- Real-time control of CER participating in Off-Market services (e.g. by both FRMP and Non-FRMP aggregators/HEMs providers) in the provision of aggregated CER services such as VPPs and minimum and peak demand abatement services for DNSPs.

- For AEMO grid security of supply services such as FCAS by service providers that may or may not be the site/home FRMP.

As such, minimum requirements for local (via a communications port) RTD would include time-stamped packets of "instantaneous".

- Voltage (Min, Max Average)
- Current
- Power Factor
- Reactive/Active Power

At a frequency of 1 Hz or higher accuracy (i.e. once every second as a minimum).

Further, accumulated, time-stamped energy data (import and export kW/kVA registers) should be available locally at the end of every 5-minute interval or, if not supported by the metering installation, every 30-minute interval until the metering installation software is remotely updated to include support for 5-minute interval data.

Note: The test that should be applied to real-time data supplied by the meter is. "Is the local real-time data supplied of a type, accuracy and frequency, such that a calculation (external to the meter) by a local control system, of the import/export energy using the real-time data supplied at the meter communications port, of similar (class 1) accuracy to a calculation carried out by the meter itself."

b) What should be defined and/or further expanded in AEMO procedures?

AEMO Meter Data Provisioning procedures should ensure that standards exist for the provision of meter data locally, including secure interoperable local access to real-time meter data.

In part a) above, we have detailed the requirements (definition and supporting use cases) for local real-time meter data; local access to meter data should be common across metering installations at a protocol level.

Our research shows that two of the most common protocols currently in use globally for smart meter communications access are:

1) DLMS (natively supported by most all smart meters)

See:https://medium.com/@ProtocolGatewayLeaders/dlms-cosem-for-smartmetering-19d9e968c4a0

2) SunSpec Modbus (many brands of smart meters are increasingly supporting Modbus)

Further, Modbus is the "go to" protocol for behind-the-meter control of CER (e.g. most solar PV and battery inverters support Modbus), so it makes sense that smart meters also support the Modbus protocol.

See: https://sunspec.org/sunspec-modbus-specifications/

Supporting the case for Sunspec Modbus, the Sunspec organisation is now working to formalise the Australian variant of the Grid communications protocol IEEE 2030.5 - that being CSIP-AUS (refer to the ANU-led ARENA project working group and standards Australia adoption of CSIP-AUS). This includes required security/access profiles. Please see the following April 2022 announcement:

See: https://sunspec.org/sunspec-april-2022-ecosystem-newsletter/

Noting per the above press release, Sunspec is working on security aspects with the Australian Cyber Security CRC.

https://cybersecuritycrc.org.au/

Hence, in addition to grid control of CER via CSIP-AUS, it makes sense that the Sunspec Modbus protocol and use of CSIP security protocols are candidates as the basis for secure local metering interoperability/ local communications with the site/home CER ecosystem.

As smart meter software can be remotely maintained, existing metering installations can (and should) be updated to enable local data exchange/interoperability of the metering installation whilst maintaining security of access (as authorised by the consumer) using a similar certification/security process currently in use by Australian DNSPs for the implementation of CSIP-AUS grid control of CER.

The use cases we have detailed do not intend the use of meter data, including real-time data, for the purposes of settlement and billing. Hence, it is our view that the meter data does not need to be validated for the identified use cases. This approach is consistent with the treatment of, and access to, non-validated meter data in the EU.

Question 7: How should real-time data be accessed and shared?

a) Do parties, other than metering service providers, need to locally connect directly to the meter to access real-time data? If so, what changes are needed to enable this?

As detailed throughout our response, certified third parties need to connect locally/directly to access meter data, including real-time data from the metering installation, to deliver the services/use cases previously described.

Changes would need to include:

- Physical access (locally) to the metering platform (see below) using standards-based communications connections/interfaces.
- Multiuser interoperability for local data exchange supporting open standards-based protocols. See answer to 6) b) above.
- A certification process for third parties/third-party equipment locally accessing the metering platform that encompasses robust certification processes for data security. Again, see the answer to 6) b) above.
- As it is the consumer's data, access must include robust consent processes that embody privacy practices. Again, see the answer to 6) b) above.
- The consumer's consent to access data and /or control their CER (noting that CER use creates metering data) should not be tied to providing energy to the consumer as a means of obtaining the consumers' consent. (Noting this is already happening. As detailed previously, we have seen a disturbing trend whereby some consumer retailer energy contracts have an embedded clause whereby the supply of energy is predicated on the consumer releasing control rights of the consumer CER (and hence data), such as CER on a controlled load circuit to the retailer.)

Notes to physical access to meter data (locally):

Enabling physical access locally to meter data, including real-time data, should also follow industry standards and, where possible, be "future proof", at least for the life of the metering asset.

Physical local access should:

- be secure, and
- provide for multi-user access,

which in the communications industry implies a TCP connection (Ethernet/standard RJ45 connector as found on your home router/switch) or if the meter only supports a serial connection, then the ability to attach a serial device that can provide the required TCP connection multiuser access.

The next issue is what further technology standards should be used to support a TCP approach. A Power Over Ethernet (POE) standard RJ45 communications port on the meter would allow external (approved/certified) devices to be connected and powered from the smart meter such that they could even possibly be added to the smart meter by the customer.

Devices such as Wi-Fi extenders, 4G/5G dongles, point-to-point Wi-Fi, or an intelligent ethernet switch with connectivity to the home router could be used for the final communications connectivity.

It is important to allow the market to innovate around the final integration and communications technologies, but this can only be achieved through a ubiquitous and stable connection to the smart meter, and POE RJ45 TCP technology is ubiquitous and does just that. This should be the default for all new meters deployed as soon as possible.

Note to use of Wi-Fi for access to metering data:

We understand that some meter manufacturers are looking at Wi-Fi as a possible multi-user interface option for local communications, specifically the older 2.4 GHz variants of the standard. In our experience, whilst Wi-Fi in the meter may appear appealing, the meter box is a Faraday cage, so signal propagation beyond the meter box would be limited. Further, Wi-Fi is also an ever-changing standard, and the meter requires communications technology longevity and support for older 2.4Ghz Wi-Fi IOT devices, and consumer access points are disappearing. This should be considered in deciding what the physical access mechanism to the meter should be for local access to meter data, as the longevity of the metering platform and its communications should be considered from a cost perspective not only of the metering platform but also the cost to industry in developing and supporting technology to interface locally with the metering installation.

In keeping the metering installation simple and cost down, the market can innovate the additional technology connectivity required for site CER, the customer's desired services and site-specific needs.

Existing metering platforms:

An "upgrade path" would depend on the smart meter capability for existing meters in the field. For those smart meters with a serial or TCP Ethernet port under a sealed level 2 ASP cover, a redesigned/field refit program of the existing cover to expose the ports could easily be carried out. Whether this is on a case-by-case basis (at the consumer's request) or mandatory as part of a wider accelerated rollout (until such time as new meters are equipped with a common interoperable multi-user access mechanism), this requires further industry discussion.

Importantly, during any transition phases, no one party should enjoy a competitive advantage in accessing meter data (locally or remotely), including (local) real-time meter data in the provision of CER products and services. To this extent, it is important that a rule change makes clear that the metering installation is restricted to settlement, billing, maintenance, and the provision of meter data locally (at the consent of the consumer), including real-time data, to all parties on an equal/neutral cost and technical basis.

For those smart meters with only a serial port. A serial-to-communications adapter (many exist) could be retrofitted under the current serial port cover, and the existing cover could be redesigned to expose an Ethernet port. For example, looking at EDMI meters, there are multiple sources from EDMI product literature and third-party companies that detail how access to EDMI meter data, including real-time data, can be cost-effectively carried out locally at the meter. For example, see:

https://sbs.digital/products/modbus-duo

Extract: *"A "plug and-play device that enables customers to integrate their meter systems with building management systems by converting the second communications port of EDMI "ATLAS" series meters EDMI Command-Line output to 2-Wire MODBUS RTU. This allows a Building Management Systems (BMS) and Netstream, or an Energy Management Stream (EMS), to concurrently access the same EDMI Atlas Meter for real-time reporting of meter parameters."*

Whilst not an Ethernet TCP/IP solution (which does exist), this option still provides multi-user access. Such devices, even at one-off prices, are significantly cheaper than installing a parallel connection point meter at a cost of $500 to $1200 to the consumer. Even a field upgrade would provide significant benefits and cost reductions to industry and consumers over the life of the metering installation that would far exceed the cost of the upgrade.

Finally, as the intent is to reduce costs and create technical and commercial neutrality in the delivery of CER products and services using the metering platform as the enabler and not as a competitor to industry and innovation, then access to meter data locally, including real-time data such that existing parallel class 1 connection point metering is NOT required means service providers require local access to the meter via a multi-user interface supporting an interoperable protocol such as DLMS and/or Sunspec Modbus. The metering service provider's role in this should be to facilitate such access to certified third parties as authorised by the consumer as the owner of the meter data.

b) Are there alternative data-sharing arrangements that should be enabled by a rule change, if made?

We believe we have covered the required data-sharing arrangements in our answers above.

Question 8: Who should bear the costs of accessing real-time data?

a) Should all consumers bear the cost of accessing real-time data?

We have detailed examples of the current extensive costs (both capital and ongoing) that consumers and industry are shouldering now, due to the lack of meter data, particularly local real-time data.

The growing need for local real-time data, in many cases, is due to mandates by DNSPs for export/import connection compliance, and this needs to be considered when allocating costs. The need for local real-time meter data is no longer just confined to one of choice by the consumer but is increasingly becoming a requirement where DNSPs are mandating dynamic connection import/export control compliance, e.g. for solar PV exports, and most recently for import control of EV chargers (ref Energy QLD). These dynamic connections provide cost savings to networks through constraint mitigation (such as minimum and peak demand abatement), network augmentation deferral, and support AEMO grid security of supply. Consumers are "required" to install parallel class 1 metering to supply the real-time power flow data for site compliance by CER under CSIP-AUS control algorithms.

Access locally to smart meter real-time data would significantly reduce compliance costs for consumers, precluding the need to install additional, parallel Class 1 metering at the connection point.

The above example of mandated dynamic connections requiring access to real-time meter data for compliance shows that it is no longer just consumers who are choosing to install HEM systems and/or participate in grid services that require access locally to real-time data.

As such, any cost allocation associated with access to meter data, including real-time data locally, should take into consideration network benefits/grid security of supply on a whole-of-system approach with consideration for other flow-on-grid benefits from consumers using real-time data such as optimising solar self-consumption which mitigates minimum demand issues.

In the case of local meter data, it is our understanding that the required real-time data exists now in the metering platforms, so we are only talking about the physical access requirements, software changes/protocols and security aspects of access. To offset this, the trend to embed more and more capability and processing power in the metering platform to run services beyond settlement and billing must be addressed, as this was not the intention of the NER, and it distorts the market for CER products and services as only the MC/MDP/MP can access the metering installation. Keeping the metering installation simple will offset costs associated with local access to meter data, including real-time data. Consideration should also be given to the mitigated network costs associated with mandated dynamic import/export connections that consumers must comply with. Access to the meter data locally has many positives for the grid, with many of the net benefits flowing to all consumers, and as detailed throughout this response, these benefits far outweigh any costs associated with the provision of the meter data, including real-time data locally.

b) What would be the benefits of a dispute resolution framework, and how should it operate?

We can look to a relevant example here to understand the benefits of a dispute resolution framework and how it should operate by reference to the "consumer data right framework"

See:

https://www.aicd.com.au/content/dam/aicd/pdf/tools-resources/director-tools/organisation/consumer-data-right-framework.pdf

The benefits as stated of such a framework are:

"Consumer data rights aim to shift the balance of power between Australian companies and their customers. The consumer data rights (CDR) framework creates rules in relation to account service and product-related information associated with individual and corporate customers (CDR data). These rules allow customers greater transparency and control over their data."

The document referred to above says that *"It has been implemented for the financial services industry and application to the energy sector is underway."*

Question 9: What changes would be required to ensure interoperability?

a) Would changes to the minimum services specification requirements be the most effective way to ensure interoperability of real-time data?

Concerning our answers to Question 6) parts a) and b), we believe that defining the requirements for physical connectivity and interoperability within the minimum services specification is required. Note

that the specification will need to deal with future meters (from a particular date), current meters, including stock, and smart meters already deployed. There will likely be the need for differing physical local access connectivity solutions for each of the categories; however, there should be a commonality in the software implementation of the selected protocol (e.g. Sunspec Modbus), data register map, data format, access frequency, data/cyber security/access authorisation mechanisms and certification processes.

b) Would any other changes be required to facilitate interoperability, such as changes through device standards?

In addition to the standards that define the physical and software access requirements that would enable local standards-based support for interoperability of the metering installation, consumer protection must also be considered, and rights defined for the use of the consumers metering data, even if it is the consumer that assigns access rights to third parties of the consumers own metering data.

Question 10: Do existing arrangements sufficiently protect consumer privacy and maintain cyber security for any real-time data framework?

a) Would any additional consumer privacy and cyber security protections be required if a real-time data framework were implemented?

Yes, the rules currently do not explicitly acknowledge the consumer as being the owner of the metering data nor confer rights of local access to the metering installation for the consumer. It should be made clear that the metering data is the consumers and that, other than for the express purpose of settlement and billing, any access and use of the consumers metering data (and/or CER attached to/controlled by the metering installation) requires the explicit, informed consent of the consumer. Further, such consent should not be a condition of energy supply to the consumer.

b) Do you consider other work programs could provide any additional protection required, such as the Roadmap for CER Cyber Security

Yes, please see our answer to Question 6) part b) above.

Question 11: What other changes would be required to enable a real-time data framework?

Would any other changes be required, for example to clarify data and storage arrangements or to implement relevant best practice features from other frameworks?

Please see our answer to Question 6) part b) referencing the works already undertaken in implementing CSIP-AUS by Australian DNSPs. Utilising best practice features from the CSIP-AUS framework would make sense given that CSIP-AUS is also dealing with dynamic import/export of power at a site/home connection point, and the access to meter data locally, including real-time data (the subject of this consultation) is one of the primary use cases to support enabling that local access to the metering installation.

Question 12: Do you agree with the proposed assessment criteria?

Are there additional criteria we should consider, or criteria included here that are not relevant

Metering installation – clarification of purpose

We generally agree with the assessment criteria; however, we have detailed any clarifications to the assessment criteria within our response to the individual consultation questions.

Importantly, as detailed throughout this response, the effectiveness of any rule change to enable consumer (and/or their authorised representatives) access to their metering data locally, including real-time data, is also dependent on the use/purpose of the metering installation as defined by the NER.

As such, any rule change should explicitly state in Chapter 7 of the NER, that the "Metering Installation", beyond its express purpose to facilitate Settlement and Billing for the Consumer use of energy, should be a commercially and technically neutral enabler/provider of data to external devices in the control and monitoring of CER products and services. The "meter installation" should not be a competitor, nor lock in the consumer, nor lock out competition, in providing CER products and services to the consumer.

To enable this:

The metering installation (metering platform, metering data, metering installation communications, etc) should be explicitly restricted to settlement, billing and maintenance, with all other products and services, such as CER control and monitoring, being external to the metering platform.

As a neutral enabler, the metering installation should also provide access (locally) to metering data, including real-time data and accumulated interval data via a local standards-based connection and open standards-based protocols such as DLMS or Sunspec Modbus (as described in answers) on a commercially and technically neutral basis.

Further, commercial neutrality means the MC/MDP/MP should NOT have preferential access to data, data frequency, data quality, or load bespoke software not available to the consumer or their representatives where that data or software is used for any commercial undertakings other than for the sole purposes of settlement, billing and maintenance of the metering installation. Any other software not explicitly required for settlement, billing and maintenance functions of the metering installation should not be allowed within the metering installation.

Finally, the consumer shall choose how and with whom their meter data is used.

Note to controlled load and the metering installation

Any local access to meter data, including real-time, should also include a provision to locally control any secondary meter channel (and any other CER control outputs) at the choice of the consumer. If such functionality is to be maintained in the metering platform (and a better approach is all CER control occurs outside the meter - keeping the metering installation simple), then this must be regulated such that any control must be at the consumers consent and the consumers choice of the service provider on a commercially and technically neutral basis. The current practice to leverage this capability as a commercial offering (as is the current strategy of some MC/MDP/MPs) is not open to competition and consumer choice due to inadvertent protections of the NER afforded to the MC/MDP/MP, which denies all competition.

Note to supply of energy and the control/ownership of meter data and CER

Further, the control of consumer CER (such as controlled load) and the forgoing of the consumer's rights to their meter data should not be a contractual condition of the supply (by a retailer) of electricity to the consumer. Some FRMP retailer contracts now have such provisions. This may require NERR changes or ACCC involvement to stop/remove these contractual requirements. This disturbing trend should be rectified in parallel to this consultation process.

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