THE UNIVERSITY OF QUEENSLAND
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CREATE CHANGE

7 November 2024

To:

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

RE: Real-time data for consumers rule change proposal

Reference: ERC0399

We appreciate the opportunity to offer insights aimed at improving access to real-time data for electricity consumers and enhancing the benefits of customer energy resources (CER). Shifting to a cleaner energy system will be enabled by customers with CER embracing and leveraging the use of smart meter information. We wish to acknowledge the commendable effort by the ECA in developing the rule change proposal and AEMC's staff in assembling a consultation paper exploring options for sharing customer data in real time to support this aim.

Although the current proposal is a step forward, we believe it needs to be part of a long term and well-designed data strategy. Seizing the benefits of the "datafication" of the economy poses challenges to policy makers. While the low-hanging fruit may be clear, the full scope of potential benefits is much more difficult to grasp, resulting in opportunities that may be lost. As such, we believe the strategy towards smart meter data infrastructure should consider an integrated, long-term approach to leverage economies of scale which can significantly reduce costs and unlock value linked to synergies and innovation.

Taking this perspective, our contributions to the questions below reflect our belief that a smart meter data strategy should not be built to only address specific current needs, but should consider future needs. Recognising this, our contributions outline this longer-term perspective, as well as responding to the more immediate use cases identified in the consultation paper.

Yours sincerely,

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Response to AEMC Consultation Paper: *Real-time data for consumers*

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The opinions expressed in this submission are those of the authors. They do not purport to reflect the opinions or views of the University of Queensland.

Introduction

This document provides responses to the consultation questions posed in the Australian Energy Market Commission (AEMC) paper regarding the *Real-time data for consumers* rule change proposal.

As stated in the consultation paper, there are unprecedented changes in response to market and technology developments. The shift to a cleaner energy system will be enabled by customers embracing customer energy resources (CER) and leveraging the use of smart meter information.

Although the current proposal is a positive step towards unleashing the potential value of CER using real-time data by customers, we believe it needs to be part of a long term and well designed data strategy. As stated by OECD in its Data-Driven Innovation Report,[1] seizing the benefits of the "datafication" of the economy poses challenges to policy makers. While the low-hanging fruit may be clear, the full scope of potential benefits is much more difficult to grasp, resulting in opportunities that may be lost.

Gartner Inc, a leading global advisory and research firm in technology, typically adopts a 3 level classification for data value perception and its strategic importance, which helps governments and business to make decisions regarding data related investments and strategies. These are:

Data as an Enabler: Usually linked to early stages of maturity, the data in this case is regarded as a basic resource for a specific activity. The value of the data here is linked to the core objective in which it was originally required. This seems to be the case of the existing rules for smart meter data use, since the data is used for basic metering, billing and settlement purposes.

Data as an Utility: In this next stage, data should be available to cover needs of several actors or stakeholders. In this case, decision makers typically map the different use cases and stakeholders that would benefit from this data to model framework and make investment and/or regulatory decisions. This

[1] OECD (2015), *Data-Driven Innovation Big Data for Growth and Well-Being,* https://doi.org/10.1787/9789264229358-en

appears to be case of the current approach in the proposed rule change, since the consultation focuses on finding new uses and users (including DNSPs and customers) for the real-time data.

Data as a Driver: At this next level, data is considered to have value in itself, accepting that the data can create value for new business, insights and innovations that we are not even able to define at the moment. Thus, a suitable data strategy should be "future-proof" and built to accommodate new use cases and drive innovation, even if we cannot define exactly what they are at the moment. We believe this is the right policy approach to support a policy change in this sector, not only due the speed of the transformations and changes, but also the costs involved in building an infrastructure to support the input, storage, processing and use of such volume of data.

Taking this perspective, our contributions to the questions below reflect our belief that a smart meter data strategy should not be build to only address specific current needs, such as those identified in the paper. Instead, we believe the strategy towards smart meter data infrastructure should consider an integrated, long-term approach to leverage economies of scale which can significantly reduce costs and unlock value linked to synergies and innovation in the use of customer data in real-time.

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

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

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

Response:

A framework for real time smart data access should not only cover the use cases we can anticipate at the moment, but also be future-proof and drive unforeseen use cases and innovation in the future.

Besides the use cases anticipated in the consultation paper, such as customers leveraging their CER use, having better control of their bills in addition to distribution network service providers (DNSPs) access for better network planning and operations, a well structure framework for data access has the potential to bring new services (and players) to provide innovative services to help customers lower their bills and DNSPs manage their networks at least cost.

An integrated framework would also allow a customer agent (retailer, aggregator or new player) to maximise value by not only having access to this customer real time information, but also by comparing and cross-referencing with real time data from other customers (respecting the required access and privacy rights).

For example, an aggregator could negotiate with the DNSP a temporary increase in the export limits (e.g. under a dynamic connection or dynamic operating envelope) for a customer if both parties have access to real-time information of the neighbourhood customers, thus maximising CER and network utilisation.

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?

(b) What is the magnitude of these costs?

(c) Who would incur these costs?

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

Response: The costs will be heavily linked to the architecture and implementation design of the infrastructure for handling the real time data. We suggest that the design should consider a data architecture that can leverage the benefits of economies of scale to reduce unit costs for the required data infrastructure.

Specifically, the framework/architecture proposed by ECA does not achieve this, since it is dependent on local access and point-to-point connections, which is not efficient in terms of scalability. Rather than a point-to-point strategy, a more effective approach would be to facilitate large-scale data exchange, such as through data streaming by meter operators, and the creation of a more centralised data hub, or a relatively small number of distributed data hubs, possibly aligning with NEM regions or DNSP

geographic coverage.

This approach strengthens the case for a benefits analysis by leveraging scalability advantages, such as cost reductions from economies of scale and value creation amplified by Metcalfe's Law, where the value of data increases as the ecosystem grows.

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?

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

Response: Yes, currently metering parties are the players better positioned to benefit from exploring the scaling benefits linked to smart meter big data acquisition, storage and processing due the nature of their business.

However, this competitive advantage could be leveraged to create value across the entire industry. Metering parties already have the technology and infrastructure in place to acquire data from smart meters. However, there is a risk of technology lock-in by the metering companies, which could erect technical barriers to the flow of information between parties (customers, retailers, DNSPs, etc.) that cement their privileged position in the ecosystem.

That said, the most cost-efficient way to obtain real-time (or near-real-time) data at scale is to fully utilise this existing infrastructure for real-time data transmission. This data could be integrated into a centrally-managed data hub, providing near-real-time access to all relevant parties while respecting access rights.

Interoperability issues would be restricted to metering data providers that would need to convert the data from their internal systems to a standardised format of a data-hub.

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

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

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

Response: If designed effectively, a scalable, big data framework for real-time smart meter data could provide access at near zero marginal cost, enabling a wide range of business cases for DNSPs. Beyond the basic energy use and power quality data (PQD), this framework could support additional use cases, such as load and export monitoring, consumer behaviour forecasting, power flow optimisation, fault detection and others.

While these individual cases might not independently justify the significant investment required for a real-time data acquisition infrastructure, once a scalable real-time data acquisition infrastructure is in place, they become viable due to the minimal marginal costs required to enable such use cases; that is, economies of scale become available and should be exploited. Moreover, the availability of this data should lead to innovation and the development of new, unforeseen use cases that enhance the data's value and the efficiency of the power system as a whole.

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?

Response: Ideally, the data access regime should use a **controlled open access approach**, in which all valid parties that need to access the data should have the right to do so. Potential players that would benefit from these access include: DNSPs, retailers, customer agents and AEMO, as well as the customer themselves.

A controlled open access regime would ensure that data is accessible to all authorised users, but in accordance with the principle of least privilege. This means that while various stakeholders can access the data, they are only granted access to the specific information needed for their particular use. As a result, data would be made available in varying levels of granularity, aggregation, or with access to different data fields depending on the stakeholder requirements. This type of multi-party access regime is common in other industries such as health and finance.

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?

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

(c) Should data be validated or not?

Response: The proposed definition of real-time data is appropriate for the current context, particularly given the 5-minute settlement period.

However, real-time data is typically un-validated data. In practice, various issues often arise during data acquisition, which are corrected later through processing. However, the time required for these corrections makes real-time validation impractical.

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?

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

Response: As discussed previously, a local point-to-point approach does not provide the scaling benefits and adaptability requirements required to provide a viable real-time data sharing framework.

It would be more effective to establish a data hub framework, where meter data providers can adapt their systems, not only to acquire meter data in real time but also to transfer this data through methods such as data streaming to a standardised data hub. This hub could be managed centrally or distributed, offering a unified platform for real-time data access and management.

Such a framework would streamline the flow of data, enhance interoperability, and ensure that all relevant parties can access the data in accordance with their specific needs, while ensuring the proper access, authorisation and authentication controls linked to data usage rights and customer privacy.

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

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

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

Response: As presented in the consultation paper, the data-sharing framework does not provide a clear shared or societal benefits to justify distributing costs among all customers. In the current proposal, it is evident that both cost drivers and benefits are tied specifically to the advantages that real-time data access would provide for one or a few specific customers. This is a typical case where the beneficiary should bear the costs.

Conversely, an integrated data hub for real-time data, as proposed in this submission, would offer a foundational data-sharing infrastructure (for real-time and historical data) serving the broader public interest and yielding shared benefits.

In this context, a hybrid cost-sharing model could be adopted, which mixes collective and user-pays cost recovery elements. Overall, the costs to operate and maintain such infrastructure would be distributed among all customers, but these costs could be partially offset by service fees charged to authorised representatives when they request or access such data for commercial purposes. This cost recovery arrangement mirrors the two-part network tariff design widely employed in electrical, gas, water and telecomms networks.

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?

(b) Would any other changes be required to facilitate interoperability, for example, changes through device standards?

Response:

Changes in smart meter standards are considerably more complex to establish due to the involvement of numerous stakeholders and providers. Additionally, implementing these changes is highly costly, as over one-third of smart meters are already installed across the network, potentially requiring extensive meter updates or replacements.

Interoperability efforts should prioritise the systems of metering providers, focusing on large-scale adjustments within metering data providers systems rather than changes to the physical meter hardware itself. The only necessary modification for smart meters should involve the reading frequency, which needs to be updated accordingly.

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?

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

Response: Yes, when building a framework for data sharing, it is essential for individuals to trust that their data are duly protected against unauthorised access and misuse. This requires implementing robust privacy and cybersecurity measures.

For a framework or infrastructure that seeks to leverage the use of real-time data, this is even more critical, as real-time data flows inherently present heightened risks and complexities. Therefore, careful planning around privacy protections and cyber security requirements are crucial to implement such framework.

This should be considered as part of an integrated approach. Thus, instead of considering specific protections linked only to real-time metering data, decisions on this should be part of a broader discussions, such as the CER Cyber Security Roadmap.

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

Response: A real-time (or even historical) data framework should be adaptive and scalable. It must be adaptive because both industry and technology are constantly evolving, requiring the framework to adjust to new developments as they arise, especially when tested against emerging use cases.

Additionally, **scalability** is crucial to explore the advantages of economies of scale and network effects of the digital world. With a larger data pool, marginal costs decrease while the benefits grow.

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

Response: Yes, the proposed assessment criteria align well with a rule change decision process.

However, we note that the industry is currently in a unique period of technological transition. Therefore, decisions should be carefully considered to avoid the risk that short-term implementation challenges may drive choices that constrain optimal long-term options, ultimately limiting innovation and flexibility.