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By online submission to:
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Dear Mr Walker

Consultation Paper: ‘Smart’ Demand Response Capabilities for Selected Appliances

Thank you for the opportunity to provide feedback on the proposal to mandate ‘smart’ response capabilities for selected appliances set out in the Consultation Paper dated August 2019.

AEMO supports the objective of the proposal, being “to contribute to reducing the future investment requirements for electricity network, generation and transmission infrastructure due to growth in peak electricity demand, and to address network costs arising from the rapid growth in customer-side renewable generation, by facilitating development of the demand response market”.

As widely recognised, the energy sector is experiencing a range of disruptions resulting in rapid transformation of our energy system and markets. Key drivers of change include the changing generation mix and rapid uptake of variable renewable energy; the introduction of storage technologies; and changing customer preferences resulting in a more active demand side. In particular, Australia’s power system is becoming increasingly decentralised, as more distributed energy resources (DER), including small-scale generation and storage capability, connect to the grid.

As outlined in AEMO’s recent submission to the AEMC’s Wholesale Demand Response Mechanism Consultation Paper, the variability of the power system is increasing on both the supply and demand sides, with more parties actively responding to price signals that may not align with system requirements (e.g. simple retail tariffs). Given technological advancements, AEMO considers that DER and demand response (DR) should play a much greater role than at present to enhance the reliability and security of the system. Market frameworks need to be adapted to effectively and efficiently enable the two-way energy system of the future.

Within this context, AEMO has commenced a program of work designed to better utilise DER, and support the establishment of a world-first DER system and trading marketplace for electricity and related services in the National Energy Market (NEM)¹. AEMO is working in partnership with a range of parties to make this happen in the most effective way for the grid, and to drive value for energy consumers. One key stream of AEMO’s DER program is the development or enhancement of appropriate technical standards for DER and the connections framework. As a nomination organisation, AEMO has representation on the EL54 Standards Committee and is actively supporting the development of AS/NZS 4755, the subject of this Consultation Paper.

¹ Further information about AEMO’s DER program can be found at www.aemo.com.au/Electricity/National-Electricity-Market-NEM/DER-program.

Mandating Demand Response Capabilities

AEMO agrees that Option 3 in the consultation paper – mandating the presence of demand response capabilities for certain appliances through AS/NZS 4755 – is the best option presented to effectively facilitate the development of DER and DR markets in Australia (and New Zealand). AEMO recently assisted the two public consultation meetings held to discuss this proposal by presenting on why this capability is necessary, including the benefits of having a set of minimum DR functionality in the set of appliances proposed.

In AEMO's view, options that don't mandate DR capabilities will be less effective and will result in the slower development of DR markets and services, which are critical to supporting power system security and reliability in the future. Effective integration of standardised, flexible DER and DR capabilities will support:

- Reducing peak demand and the wholesale energy cost of meeting peak demand;
- Greater system resilience responding to challenges of weather-dependent renewable energy;
- Greater local network resilience especially as DER saturation increases;
- Ability to provide network services to offset network augmentation investment;
- Load increases to manage minimum demand (or peak solar PV generation); and
- Power system security, including frequency control, voltage limits, system re-start ancillary services, and reducing the number of power system directions made by AEMO.

Based on our support for Option 3, and our involvement in this initiative to date, we have not sought to respond to each consultation question. Rather, we have provided some high-level feedback and suggestions to support further development of Option 3.

Demand Response Modes

AEMO is supportive of the full range of proposed Demand Response Modes (DRMs) to be covered in the AS/NZS 4755 framework, and the proposal to require mandatory compliance with these DRMs.

AEMO considers that the ability to curtail, time-shift, and turn on load are equally important capabilities. While historically, peak demand has been a key issue for the system, minimum demand (or peak solar PV generation) is also increasingly causing issues for system security. Therefore, flexible DR capabilities that support effective management of both peak and minimum demand, as well as broader system security and reliability benefits, are supported. AEMO also agrees with the Consultation Paper, that the presence of DRM 2 (limited power to 50%) and DRM 3 (limit power to 75%) increases the flexibility of the DR available, and that consumers will be more inclined to participate (by contracting with the DR service providers) if there is assurance of partial service during peak events.

AEMO welcomes the opportunity support further development of the mandatory DRMs to be included in the standard through our representation on the EL54 Standards Committee.

Proposed Appliances

The Consultation Paper proposes that all air conditioners, electric water heaters, swimming pool pump controllers, and electric vehicle chargers that are supplied or offered for supply would be required to comply with the full range of DRMs. AEMO is supportive of the requirements applying to these proposed appliances.

The Consultation Paper acknowledges that since the proposal was last considered in 2013, two additional products now have an increasing presence in the market – PV inverters and home storage batteries. While these products are not currently within the scope of the proposal, AEMO is firmly of the view that the proposal should be extended to include PV inverters and home storage batteries, and that they should be captured by the scope of the AS/NZS 4755 framework.

AEMO strongly recommends that consideration should also be given to inclusion of home energy management systems within the scope of the current proposal.

Including these products is important if the benefits of DR capability are to be fully realised, particularly as the market for energy storage and home energy management is expected to grow significantly over the next 10 years. Australia is projected to be the most distributed grid worldwide by 2030, and AEMO estimates that about half of Australia's approximate 12 million connection points will have DER by that time. Embedded battery storage capacity is expected to grow from 0.8 GW to 15.9 GW by 2030, and virtual power plant (VPP) aggregate load/storage capacity (delivered through home energy management systems) is expected to grow from 53 MW to 9,100 MW².

AEMO suggests that further consideration should be given to the thresholds or capacity limits that will apply for some of the proposed appliances in order to avoid situations where appliances that are marginally below or above the thresholds can avoid compliance with the required DR capabilities.

Baselines

The Australian Energy Market Commission (AEMC) has recently published a Draft Determination to introduce a Wholesale Demand Response (WDR) mechanism into the National Electricity Market (NEM)³. This mechanism would rely upon determination of a baseline for each individual connection point participating in the mechanism.

AEMO's experience in DR trials, in collaboration with ARENA, demonstrates that baselining can be particularly challenging for smaller energy volumes and small consumer loads. Due to the behavioural nature of small consumers' responses, and the technical characteristics of the load profile of households, it is difficult to establish predictable baselines and verifiable demand responses of individual small consumer loads.

The rigid nature of the proposed DRMs will make it easier to determine a counter-factual baseline consumption level for the measurement of DR. However, further work will be needed to ensure the source and integrity of measurements to support baselining, including consideration of whether separate metering of DR-capable devices is required. AEMO is examining these matters in its VPP demonstrations that launched in July 2019⁴.

² AEMO, 2018-19 Integrated System Plan and 2019 Electricity Statement of Opportunities, available at www.aemo.com.au

³ AEMC, Draft Rule Determination, National Electricity Amendment (Wholesale Demand Response Mechanism) Rule 2019, 18 July 2019, available at www.aemc.gov.au/rule-changes/wholesale-demand-response-mechanism.

⁴ Further information on the VPP Demonstrations is available at www.aemo.com.au/Electricity/National-Electricity-Market-NEM/DER-program/Virtual-Power-Plant-Demonstrations.

Incentives

AEMO considers that the ability to unbundle DR services from retailing, as is proposed for the NEM in the AEMC's WDR Draft Determination and currently exists in Western Australia's Wholesale Electricity Market (WEM), can allow customers to be rewarded for their flexibility without requiring comprehensive reform of retail tariffs. This unbundling of services will help to increase competition and consumer choice, while supporting the reliability and security of the power system.

The NEM retail arrangements currently allow flexibility for retailers and customers to tailor pricing arrangements, and the National Electricity Rules (NER) do not present barriers to demand side participation. However, the Australian Competition and Consumer Commission (ACCC) has observed that existing retailers may not possess specialist DR expertise that can be offered by third-party aggregators and service providers, and may have insufficient incentives (particularly those that are vertically integrated with generation) to use DR to manage risk, given greater familiarity with other risk management tools⁵.

The unbundling of DR services from retailing increases the avenues through which wholesale price signals can reach end-consumers to elicit behaviour that benefits the system as a whole. This can enable those individual customers to benefit from their contribution to the power system, while lowering total costs for all consumers.

Related regulatory reforms

The proposal is complimentary to other reforms currently being implemented or progressed, including the Five-minute settlement rule change, the Retailer Reliability Obligation (RRO), and the WDR mechanism rule change. The mandating of DR modes within AS/NZS 4755 and a build-up of DR compliant appliances in the market will enable a faster adoption of the proposed WDR mechanism (and potential DR mechanism for residential customers, subject to appropriate consumer protections). We understand that the standards have been developed for five-minute capability so will align with the move to five-minute settlements.

Conclusion

AEMO is supportive of mandating the presence of demand response capabilities for certain appliances, and welcomes the opportunity to support further development of the proposal and AS/NZS 4755. Should you have any questions regarding this submission, please contact Kevin Ly, General Manager Regulation at email: kevin.ly@aemo.com.au.

Yours sincerely



Peter Geers
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AEMO

⁵ ACCC, Retail Electricity Pricing Inquiry – Final Report, June 2018, available at www.accc.gov.au/publications/restoring-electricity-affordability-australias-competitive-advantage