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Dear John

**AESA Submission to AEMC Five Minute Settlement Directions Paper**

The Australian Energy Storage Alliance (**AESA**) is grateful for the opportunity to provide comments on the Australian Energy Market Commission's (**AEMC**) Five Minute Settlement Directions Paper (11 April 2017) (**Directions Paper**), on behalf of those in the AESA group.

The AESA has sought the views of our community on the Directions Paper. Based on the submissions we received, we have ascertained that many in the AESA group broadly support the AEMC's initial position on the proposed five minute settlement rule change, as outlined in the Directions Paper. More detailed comments addressing various aspects of the Directions Paper are set out below.

**1. About the AESA**

The AESA was formed in 2014 and is governed by a volunteer Steering Committee. Our goal is to be an effective vehicle for our members who are active or interested in the energy storage sector, through enabling:

- networking and information sharing;
- promotion of member activities, successes and events;
- sharing innovative ideas and case studies;
- showcasing of new economic models incorporating energy storage; and
- collecting relevant feedback from members to pass onto government and relevant organisations.

**2. Materiality of the problem**

Feedback received from AESA's members suggests that our members broadly support AEMC's finding that, on balance, there is a material problem with the 30 minute settlement regime which could be addressed through adoption of five minute settlement.

Certain members have also highlighted the likely benefits of moving to the five minute settlement rule.

For example, Dominic Adams, on behalf of Mojo Power, a "new energy" retailer, commented: "Mojo broadly supports the analysis conducted by the AEMC concluding that the current arrangements result in a materially less efficient wholesale market. This inefficiency is both allocative and dynamic.

The current mismatch between dispatch and settlement periods does not send an efficient signal of the value of directing resources to meeting the real-time supply and demand balance in the wholesale market. This has significant longer term impacts on the dynamic efficiency of the wholesale market, which is critical to investment decisions on the entry and exit of capacity in the National Electricity Market."

Jamie Allen on behalf of LG Chem Ltd commented that "The introduction of the 5 minute settlement rule will provide much better competition in the Australian energy market and provide new opportunities for peak energy offset solution deployment to reduce the spot market cost of electricity for a range of industries and consumers.

We are in favour of the 5 minute settlement and believe this much smaller trading interval would encourage more competitive trading and enable the uptake of grid scale and distributed energy storage systems on industrial and consumer sites to lower their peak demand charges, support networks and also provided opportunities for networks to additionally access/purchase this energy during extreme weather and peak demand events."

Mike Swanston on behalf of the Customer Advocate agrees with many of the views expressed by AESA members. Mike commented that in his view there is "strong support for the transition to a 5-minute market settlement, as it would improve the electricity market through a closer alignment to true dispatch costs. As distributed and decentralised energy technologies adopt fast-response systems - in particular energy storage - a market that better addresses the intermittent nature of renewable generation, fast frequency response and dynamic customer loads is developed."

Mike also added, "customers and utility generators will receive benefit in being encouraged to adopt technologies that respond to fast load change, with flow-on benefits for energy balancing, network optimisation and the optimum adoption of low-carbon generation."

Mike observed "it is recognised that the 'Bidding in Good Faith' rule, adopted in July 2016, has gone a long way in correcting adverse market behaviour by some generators, but it does not address the significant change in energy technology in a low-carbon economy.

Whilst the benefits of a market that is more cost-reflective, dynamic and supportive of new low-carbon technologies, of concern is the nature of the costs to customers and the community that may arise as a result of the rule change."

Ecoult's view is that the proposed rule change, if adopted, is likely to assist in:

- reducing carbon emissions by increasing opportunities for renewable and storage applications managing grid variability;
- reducing peak pricing for customers through increased energy storage and more competition for short-duration bids; and

- bringing Australia into line with other advanced economies using short-period settlement whose market size tends to dictate the global standards and equipment that Australian markets are exposed to.

### 3. Design issues: metering

Ipen Consulting endorsed the AEMC's initial position that the use of revenue metering is the preferred option for five minute settlement data collection. Hugh Outhred on behalf of Ipen Consulting noted that "interval metering is now widely deployed and will become steadily more common in future. It should be configured to measure five minute data for energy and availability and quality parameters, such as voltage, waveform purity and supply availability."

### 4. Impact on operation and investment

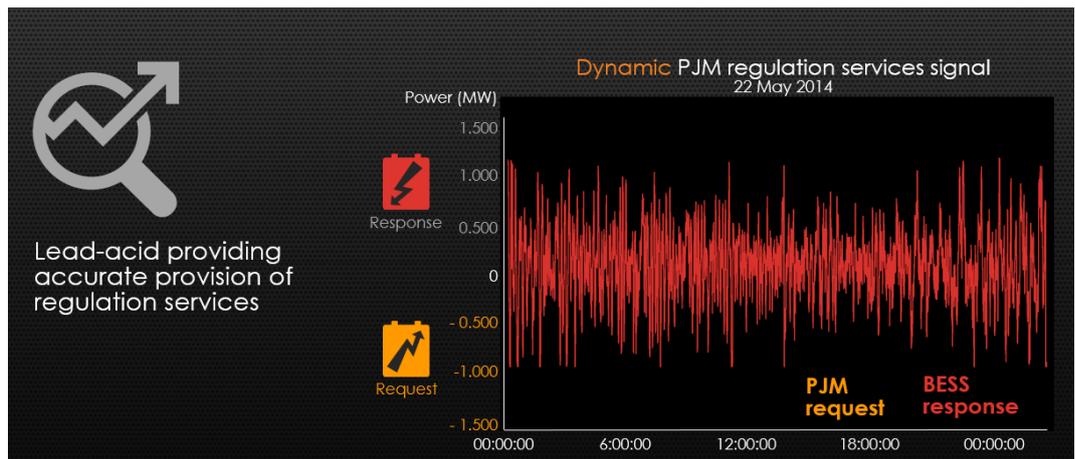
Based on submissions received, there was support with the AESA group for AEMC's initial view that five minute settlement would create greater incentive for investment in battery storage and other flexible technologies.

For example, Emma Fagan on behalf of Tesla Energy has noted that "the shift will provide vital investment signals to support the increased uptake of flexible technology – which will play a necessary role in supporting increased renewable energy penetration."

Robert Stevenson of Ecoult discusses the role that battery storage has in short settlement markets in other jurisdictions globally, illustrating the impact a shorter settlement time can have on investment in storage and the associated benefits this can bring.

Robert noted: "Ecoult would also like to point out that the types of variability management applications that batteries are now performing on the grid are vastly different from the role played by batteries in previous decades....."

The signal below shows a typical 24 hours of operation of Ecoult's batteries performing frequency regulation on the PJM grid in the USA. This is a request-response application (the request trace is hidden by the response trace in this image since there is a near-perfect overlay.)



This type of duty cycle has been performed by our batteries 24/7 in grid frequency regulation for several years now without significant degradation of the cells. We see similar duty cycles in megawatt scale solar smoothing at the Prosperity Solar Project in New Mexico where we have had UltraBattery in service for 6 years without any significant degradation of the cells.

There has been continual improvement in the technology of battery storage systems and continual reduction in price.

Battery technology is maturing very quickly and there is now a body of evidence to show conclusively that these technologies can perform economically and well in the types of applications that will appear under short-duration settlement conditions, for instance allowing PV and wind generators to confidently bid into 5 minute periods and buffering existing gas generation that cannot ramp quickly enough to do so.

Shorter-duration settlement appears likely to be implemented eventually and there are significant costs to be borne whether the change is made today or put off for consideration at some future time."

## **5. Costs and transition**

### *Effects of reduction in caps market*

Dominic Adams on behalf of Mojo Power notes that "we acknowledge the analysis from Energy Edge (Effect of 5 Minute Settlement on the Financial Market; March 2017) that "across the market approximately 625MW of flat cap equivalent (23% of underlying cap volume) is likely to be withdrawn from the market".

As an innovative and growing retailer, Mojo is well aware of the need for a liquid market for risk management products upon the implementation of five minute settlement. In the event of a contraction in supply of hedging products, retailers are likely to pass on the additional costs to consumers. This includes higher costs of hedging contracts, and the inclusion of risk margins for unhedged load. This would also be likely to have flow on effects for competition in retail markets.

An appropriate transition period is necessary to mitigate these risks. We consider the proposed staged transition period set out in Chapter 7.4 of the directions paper is appropriate.

A range of new strategies are likely to evolve to manage wholesale risk on a move to five minute settlement. This should include both supply and demand side changes for existing and new assets... The increasing penetration of new technologies is likely to continue to develop new risk management products for market customers."

Similarly Emma Fagan on behalf of Telsa Energy noted "we acknowledge the concern of the AEMC that the liquidity of the cap market will be reduced during this transition, however we believe that battery energy storage can be used to fill some of the anticipated capacity gap in the caps market expected during this transition. This will manage some of the expected price volatility and concern for both second and third tier retailers, and for end use customers."

### *Transition period*

Several energy storage companies shared their views with the AESA that a one-to-three year transition period for the rule change is desirable.

For example, Emma Fagan on behalf of Telsa Energy noted: "Support for the change to be adopted within 1-3 years to provide greater investment certainty for the take-up of flexible technology. This timeframe should acknowledge both the fact that energy storage technology is technically capable, and has demonstrated experience, in being fully integrated into existing wholesale energy markets around the world. Further this timeframe should acknowledge the speed of deployment at which large-scale battery

energy storage can be deployed. Tesla has demonstrated experience in deploying 80MWh of capacity in three months for Southern California Edison."

GreenSync noted that it "fully supports the move to 5 Minute Settlement, but also understands that changes may affect market price certainty. To address this concern, we would favour the introduction of a shadow market for a full 12 months to offer stability to market through its introduction."

## **6. Conclusion**

AESA's members who responded, support the proposed 5 minute settlement rule change and in general consider that it is important step for achieving transformative change in the National Electricity Market, needed to support the effective integration of renewable energy generation and distributed and decentralised energy technologies that adopt fast-response systems, such as energy storage, into the market. Based on submissions received, many in the AESA group consider that the proposed rule change if implemented would improve efficiency and competition in the National Electricity Market, which is in the long term interests of consumers of electricity, thereby achieving the National Electricity Objective.

Phil Blythe on behalf of GreenSync commented: "A new mindset is needed to nudge us from obsessing about 'market reform' to focus instead on 'new market creation'. The future of the NEM is about thinking big, embracing change, and igniting a psychological shift in understanding our new roles in the transformed energy system."

## **7. Questions**

This submission was prepared by Mary Hendriks, Industry Executive, Australian Energy Storage Alliance with assistance from Aylin Cunsolo, Senior Associate, Baker McKenzie.

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