



Australian Energy Storage submission to the Australian Energy Market Commission

Five Minute Settlement

Reference: ERC0201

Stage: Consultation on request for rule change Proponents: Sun Metals Corporation Pty Ltd

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### **Submission to the Five Minute Settlement rule change request**

We are responding to the consultation paper for the amendment to the National Electricity Rule 'Five Minute Settlement' 2016.

Several members of the Australian Energy Storage Alliance responded to a request for input on this proposed rule change, and the Australian Energy Storage Alliance (AESA) is making this submission on behalf of those contributors listed below.

Robert Stevenson, ECOULT

Mike Swanston, The Consumer Advocate

Nashaat Kabani, Saft Australia

Sid Masilamani, Energy Made Clean

Samantha McGahan, VSUN Pty Ltd

Sally Torgoman, Eco Energy World

Phil Blythe, GreenSync Pty Ltd

The AESA has received strong indications of support for this rule change as battery and energy storage technology has advanced to the stage where it can effectively provide more and more energy customers with fast-response demand response capability.

Robert Stevenson from Ecoult has provided the following:

*Market conditions on the Australian grid today are not particularly favourable for large-scale battery deployment for purposes other than stand-by applications.*

*Variability-management activities in Australia are generally reimbursed by kW and not by performance. A kW produced by a fossil generator is likely to remain cheaper than a kW stored in a battery for some time to come. (In fact the 40% saving of overall frequency regulation, mentioned in a recent California Energy Storage Alliance, would make batteries more cost-effective and environmentally sustainable in the long run. However, there is no economic incentive in Australia to be an early adopter of such an application.)*

*Furthermore, the current a 30-minute average for settlement on the NEM makes it risky for a large battery owner to provide a few minutes of peak-power during a price spike since the 30-minute average could be lower than the cost of storage.*

*The net effect of this is that:*

*Energy to cover these spikes is very likely to be most cheaply provided by fossil plants under current market conditions, despite the fact that:*

*o fossil fuels are not necessarily the most efficient or environmentally sustainable way of providing short bursts of power; and*

*o if energy storage was widely distributed, the grid would be less exposed to unexpected spikes in demand, and short-term price fluctuations may rarely take place.*

*Owners of the very significant installed resource of MW-scale, steady-state (i.e. stand-by) batteries in Australia are not incentivized to upgrade their technology to batteries designed for variability-management.*

*o It is worth noting that turning existing stand-by battery banks into variability- management batteries would be perhaps the most efficient way of giving the grid operator access to the significant quantity of distributed variability- management capability that is required for fast frequency regulation, renewable storage and smoothing, demand management, peak load management and even transmission infrastructure offsets in weak grid areas.*

*It is Ecoult's view that the introduction of 5-minute pricing as proposed by Sun Metals Corporation Pty Ltd could be a positive step towards creating similar market conditions in Australia that the performance-based frequency regulation payments have created in the USA.*

*While probably not enough on its own to make large-scale variability-management battery deployment a cost-effective alternative to fossil fuels during peak loads, 5-minute pricing may go some way toward allowing large battery owners to offer "generation" services to cover short peaks using energy stored from PV or during low-price periods.*

*This is an important step because if there was a viable market for such services, the vast quantity of existing installed energy storage could be quickly adapted to create a large grid- connected variability-management storage resource.*

*This resource could be utilised to reduce instances of variability on the grid, which would improve grid efficiency and potentially reduce peak pricing to customers. It could also offset fossil fuel generation, foster increased renewable penetration and help develop a more robust MW-scale solar-and-storage market on the NEM."*

As more customers are encouraged to invest in energy storage as a fast-response demand response service, the result of a more stable and responsive generation and demand balance will benefit the energy market and ultimately all energy customers in terms of technical performance and price stability.

Samantha McGahan, of VSUN Pty Ltd commented: *"VSUN is a subsidiary of ASX's listed Australian Vanadium Limited (AVL) and is focused on the sale and distribution of Vanadium Flow Batteries for both on and off-grid applications throughout Australia and SE Asia. As such, VSUN sees the potential for significant benefit in the requested changes set forth by Sun Metals. This change from a 30 to 5*

*minute settlement, will allow for a market in fast moving/quick reaction software and hardware to benefit where otherwise they may not. Whilst we are unable to provide exact figures as we are in a developmental phase in our business, we see this change as benefiting the fledgling energy storage market of which we are a part of, in that these units are able to deliver power in quick response where required. We see any change, such as proposed, that will deliver more competition without unduly impacting on current businesses adversely, as being to the benefit of new industry, innovation and the wider community as a whole.*

*Again, whilst it is too early for us to provide specific financial benefits of such a change, we do see the potential for an increase in the uptake of battery storage and invariably the uptake of renewable energy that generally goes hand in hand with these products. This will have a positive financial effect on the renewable industry and other innovative industry's connected to it and importantly a shift towards cleaner energy generation."*

Sid Masilamani of Energy Made Clean added that *" Energy Made Clean supports the change of rule to match dispatch and settlement periods. When it comes to Energy Storage systems, the dispatch response is almost immediate and hence these generating units can be extremely useful in dealing with peak demand instances in the network."*

With regards to the batteries part (in page 6, 13, and 21 in the Consultation Paper), Nashaat Kabani of Saft Australia, provided the following comments on behalf of Saft:

*"In the past, energy arbitrage has been viewed as a low-benefit application for energy storage, but that has been on the basis of charging at night and discharging for a couple of hours on-peak.*

*With a 5-minute dispatch and settlement period energy storage could provide a tangible benefit to the grid, while potentially providing a reasonable return on investment to the storage owner.*

*In USA the FERC has mandated that all system operators move to a 5-minute settlement period.*

*Having a 5-minute dispatch interval but a 30-minute settlement period forces storage resources to participate for the full 30-minute period, lowering the ROI for the owner and making it less likely that storage resources would participate in the market.*

*As deployments of more variable renewable energy increase, short-term dispatch of fast resources will become more important and storage should not be artificially barred from the market."*

Sally Torgoman of Eco Energy World believes *" that the move to five-minute settlement would be equivocal with other leading international energy markets, and will build on the business case for local commercial arbitration opportunities."*

Sally added *"Notwithstanding, the opportunities for localised technologies to participate in arbitrage options will be facilitated by the move to five-minutes settlement, an area of energy trading that has been dominated by larger energy players. This is a significant opportunity that would increase the customer proposition for stationary energy storage, and provide a close to real-time supply to demand matchup. "*

Dr Phil Blythe of GreenSync also supports this rule change, and added that: *“In principle, a 5 minute settlement makes it more viable for demand side resources to participate in the market”*.

It is agreed that there are significant issues to consider in adopting the more granular settlement regime. Like energy storage, however, it is considered that metering technology and data management capabilities have progressed to a point where the increased performance and capability is likely to be cost-effective. In the case of new customers who may choose to incorporate energy storage to enable fast-response demand control, current technology can reasonably include metering and, if necessary, SCADA capability to meet market requirements.

As the AEMC notes, this proposal directly impacts generators and other wholesale market participants who have direct exposure to market spot pricing. The application of large energy storage is well-proven as effective and efficient in volatile energy markets as the proportion of non-traditional generation increases, largely as frequency control (FCAS) and network support services. As commercial interests continue to invest in new energy generation technologies in Australia, the AESA supports all mechanisms that enhance the ability to provide effective fast-response demand response capabilities, as the benefits of a more stable generation mix will lead to low price risk for all energy customers.

More broadly, individual members such as Mike Swanston of The Customer Advocate, take the view that the proposed rule change is consistent with the need for a wider set of market rule reforms that reflect the imperative to adopt new and emerging technologies across large and small energy customers to deliver a more appropriate and efficient energy market. Energy customers large and small will continue to adopt energy storage and widespread small-scale embedded generation, and will demand a more flexible regulatory regime that includes efficient local energy trading capability and appropriate commercial arrangements that encourage the use of new technologies that result in the more efficient use of energy and energy assets.

The consultation paper tends to refer to a customer (i.e non-generator) fast-response demand control as the ability to reduce exposure to high prices through demand reduction. When energy storage is considered, there is clearly an opportunity for a customer to provide a symmetrical response that includes the ability to operate as a local generator for a short term should conditions require.

Below are some comments to a number of the matters raised in the consultation paper and attached also is the full submission from Ecoul.

COMMENTS (provided by Mike Swanston)

## **Issue 2: (what types of participants can respond)**

The time-constants for the control of generation plant and a large customer's demand response inherent in energy market have for many years been considered as being well in excess of 5 minutes. Heavy generation plant and the energy use behaviour of the vast majority large customers is not dynamic.

Energy storage technology is rapidly transforming this paradigm. Sub-second response times for loads and generation of the same order of the consumption of a large customer is now practical.

As prices for energy storage fall and large-scale batteries and supercapacitors continue to prove the practicality as fast-response demand management around the world, more and more customers will adopt these technologies independent of the actual controllability of the process that is the primary energy consumption.

The initial adoption of such technology will be customers with a high exposure to demand pricing and those who make significant use of embedded renewable generation. These customers will then seek to integrate the operation of these facilities to respond to market signals.

As the widespread application of small-scale energy storage develops to include some level of centralised dispatch and control through a market participant such as an aggregator or retailer, these participants will develop the capability to respond to market signals in the form of short-term generation or demand response

#### **Issue 4 – impact on demand side participation**

The incentive of more appropriate short-term settlement arrangements can be realised with battery energy storage.

New technology of energy storage, whether it be at a grid-connected level, at a large customer installation or as an aggregation of multiple small customer sites, is very likely to provide response times for fast demand management of 5 minutes or less.

Such participation will provide a basket of benefits, of which market price risk exposure is only one. Therefore, the cost of providing the fast-demand response capability is low.

#### **Issue 5 – data for settlement**

Customers who implement energy storage for purposes including fast-response demand control will be embracing current technologies. Therefore, the cost of providing metering equipment that supports 5-minute settlement is not considered to be a significant concern to the customer.

In addition, Sally Torgoman provided the following insights:

#### **SCADA profiling**

In our experience, most SCADA profiling systems are already operating at frequent sample rate and longer data averaging well within the five-minutes settlement time frame. As such, we expect some participants to require adjustments but that this would be a lesser consideration to the benefits obtained from a more accurate settlement time frame. We also expect that most participants would have meter equipment that are sufficiently equipped to manage this transition, although there may be reprogramming requirements

#### **Metering data requirements and systems implications**

Naturally the move to a shorter settlement period of five-minutes will create six times the data capacity requirement. We expect that this would increase costs for both data storage and communication. However, it should be noted that most of storage equipment participants are already using one-minute data capture as the standard configuration, and therefore only expect an increase in the data communication cost increase. [

For further details, please contact

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