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John Pierce
Chairman
Australian Energy Market Commission
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26 May 2017

Response from EnerNOC to the Australian Energy Markets Commission's *Five Minute Settlement, directions paper, 11 April 2017, Sydney* (Reference: ERC0201)

Dear Mr Pierce,

EnerNOC is a global provider of energy intelligence software and demand-side management services, and is the largest independent demand response aggregator in the world. We work with commercial and industrial energy users to offer their demand-side flexibility into wholesale capacity, energy, and ancillary services markets, as well as demand response programs offered by retailers and regulated utilities in twelve countries. Locally, EnerNOC is a market participant in the Wholesale Electricity Market, the National Electricity Market (NEM) and the New Zealand Electricity Market. EnerNOC's regional head office for Asia-Pacific is located in Melbourne.

EnerNOC is supportive of the AEMC's preliminary view to implement Five Minute Settlement following a three year transition period. In our view, this change will result in long-term market benefits that will exceed related costs. The materiality of the problem and the benefits of a five minute settled energy market have been well represented in the AEMC's publications and commissioned analysis to date, so we have tried not to re-hash them. In this submission we will contribute our view as a current and future demand-side service provider, where we feel we have something to add to the discussion.

1) Under Five Minute Settlement, energy users and demand side service providers will innovate and bring new products and services to market that do not (or cannot) exist today.

The AEMC's Directions Paper notes that there will be little benefit to furthering the rule change if participants do not change their behaviour as a result[1]. We submit that EnerNOC (and other innovative energy service providers and retailers) will bring forth new, fast-responding supply- and demand-side resources to market. On the demand side, innovations will be the result of:

[1] AEMC, Five Minute Settlement, directions paper, 11 April 2017, Sydney, p42

- *Price signals* – the value of a response in a single five minute dispatch interval will increase by as much as 6X, and the incentive to "pile in" and respond in a dispatch interval where response isn't physically needed – will be removed.

- *More predictable dispatch prices* – our view is that removal of the artificial periodicity introduced by the "5/30 issue" will result in dispatch prices that better reflect true underlying supply & demand conditions, and will thus be more model-able, resulting in increased investment confidence in both supply- and demand-side response products and frameworks.

- *Ability to make efficient consumption decisions* – in an ideal market, consumers will only use energy when the marginal benefit they derive from the use of that energy[2] exceeds the cost of that energy. Under the current 30-minute average settlement, spot-exposed customers sometimes buy expensive energy for as many as 25 minutes, without any indication that its cost exceeds its value – entirely as a result of dispatch price spikes that occur late in the trading interval and today's 30-minute averaging process[3]. If the consumer had known the eventual 30-minute price, they would have chosen not to consume energy for the entire 30-minute interval. In addition to being an inefficient outcome - the possibility of this situation occurring discourages potentially flexible customers from exposing themselves to the spot price, as doing so means that they are left with a risk that they have no means to control. With Five Minute Settlement in place, price transparency would be near perfect, and energy users could make efficient decisions to consume, or not consume, energy in each 5-minute interval. Further, the value captured by employing a demand response in any 5-minute interval is increased as much as 6X, which will bring forth new price elasticity on the demand side that has not been incentivised to participate under the status quo.

2) **Faster demand response will occur under Five Minute Settlement**
The Directions Paper cites a recent survey commissioned by the AEMC indicating that of the existing (price responsive) demand response in the NEM today: *"10 per cent of the demand response could be provided within five minutes, 70 per cent in half an hour and the remainder within an hour."*[4]. This representation would indicate that the over-valuation of slow-responding resources in the current 30-minute framework is not limited to the supply side: some consumers are also getting the benefit of "piling in" and earning a reward for providing a response in a dispatch interval where the response isn't needed.

[2] For example, the downstream revenues associated with the widgets that a manufacturer produces and sells.
[3] We also note that consumers have no ability to contribute to dispatch price formation, because dispatch prices are set exclusively by bids submitted by supply-side resources (except for scheduled loads, of which there are none in the NEM today). Consequently, the only way for a consumer to participate in the formation of dispatch prices is by signalling their refusal to pay a published dispatch price, achieved by removing their demand from the grid. 30-minute settlement mutes a consumer's ability to send this signal, and renders them unable to impact the bid stack in a manner that contributes to the formation of the dispatch price. The result is 30-minute settlement prices that do not accurately represent the price-elasticity of the demand side, and are thus inefficient.
[4] AEMC, Five Minute Settlement, directions paper, 11 April 2017, Sydney, p.49

Regardless of whether this representation from the Oakley Greenwood survey is accurate, we submit that under 5-inute settlement the distribution will change, such that a much greater proportion of demand response occurs within 5 minutes. This change will be a result of the un-muting of price signals for fast responses, technological advances, and new and innovative business models from retailers and independent service providers.

The Directions Paper cites some data from Alberta and New Zealand, where demand response provides significant quantities of frequency control ancillary services (FCAS). EnerNOC participates in both markets. Even though both markets are considerably smaller than the NEM, in each we manage triple digit MW of demand response capacity that responds in less than 1 second. We note that the types of responses required to provide FCAS are not exactly the same as the type of responses required to be price-responsive in the energy market (i.e. the speed, duration, and frequency of the required demand response varies between the two services) but submit that the principle is the same: when the demand side is provided a market framework in which to participate in a wholesale market, and provided a clear price signal for participation, the demand side *will* innovate and *will* choose to participate.

3) **Increased quantities of demand response will be available in the NEM in three years' time, and will be able to obtain value from 5-minute settlement, due to other ongoing reforms in the NEM.**
The capability of the demand side to be flexible in the NEM is growing, a result of market reforms unrelated to Five Minute Settlement, including:

1) Increased recent wholesale spot and future prices – leading to an increased incentive for energy users to explore avenues to reduce costs through employing demand side flexibility.
2) The recent *Ancillary Services Unbundling* rule change, which we anticipate will lead to substantial numbers of energy users participating in the contingency FCAS markets in the near term; once a customer has geared themselves up to participate in one market, it is easier for them to participate in others.
3) ARENA's recently announced project to fund the development and trial of approximately 100 MW of new demand response capability for reliability purposes[5].
4) AEMO's recent announcement that they will tender for Long Notice RERT resources during summer 2017-18[6].

As a result of these developments, more customers will be equipped to derive value from the Five Minute Settlement rule change when it takes effect.

[5] See https://arena.gov.au/assets/2017/05/170519_MEDIA-RELEASE-ARENA_AEMO-2017-1.pdf
[6] See http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Emergency-Management/RERT-panel-expressions-of-interest accessed 25 May 2016

4) **Five Minute Settlement will affect the supply of caps, but also the demand for them.**
From the AEMC's analysis to date it seems clear that some of the existing suppliers of caps would supply fewer caps in the future under Five Minute Settlement. The report from Energy Edge indicates that a reduction of approximately 625 MW of caps is an appropriate estimation. However, from public representations made by new market entrants including upstart retailers and distributed energy resource (DER) aggregators, it seems clear that new, fast-responding resources are being brought to market (many of them behind the meter), and that their presence in the market will grow during the three year transition period. Because these controllable resources are behind the meter[7], such resources may have limited ability to sell caps and to increase the supply of ASX/OTC traded caps. However, retailers in control of such resources will be able to physically reduce their flex risk, and will thus have a reduced need to purchase caps from the financial marketplaces. The increasing penetration of fleets of DER available to retailers seems likely to result in some retailers covering their risks with physical resources, rather than financial contracts, in the near future.

In addition, since the move to Five Minute Settlement will mean that fast-responding customers will be able to become spot-exposed without being vulnerable to retroactive high settlement prices, we would expect that the reform will lead to a significant increase in customers seeking/accepting spot exposure, and hence a corresponding drop in the demand for caps and other forms of hedge.

As a result of these trends, it seems likely that the reduced supply of caps will be at least partially offset by reduced demand for caps, and that the question the AEMC needs to consider is not as simple as "whether or not the NEM will find 625 MW of replacement cap suppliers during the three-year transition period".

Regarding the future supply of caps, we note that the AEMC missed an opportunity to encourage the increased supply of market-traded caps when it rejected the proposed *Demand Response Mechanism* rule change in November 2016. The proposed rule would have allowed independent demand response aggregators (and/or individual large energy users) to earn the spot price for demand reductions. This would have allowed aggregators to sell caps and defend them with spot price revenue earned by fast responding demand response. Absent this mechanism or something like it, there is no way for the demand side to directly contribute to the supply of caps, as all demand response effectively remains "behind the meter".

5) **Many participants already have IT systems capable of processing 5-minute settlement**
In the discussions and analysis presented around the costs of participants transitioning their IT and settlement systems to accommodate 5-minute settlement, it is worth noting that many participants already have systems capable processing 5-minute settlement data, because the FCAS markets already settle at five minute intervals, and have done so for years. An analysis of AEMO's Registration and Exemption list indicates that 19 participants are registered to offer FCAS, and that these 19 participants account for approximately 77% of the registered capacity in the NEM

[7] i.e. not directly spot-exposed themselves

today.[8] From the published discourse, we understand that the majority of participant transition costs would relate to changes to risk-management IT and software, but nonetheless, we think the point is relevant and has been overlooked to date.

EnerNOC is grateful for the opportunity to provide comment on the AEMC's Five Minute Settlement Directions Paper. Please do not hesitate to contact me if you have any queries.

Regards,

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[8] AEMO Registration and Exemption List accessed 25 May 2017. Participant data from 'Ancillary Services' tab, and 'Reg cap (MW)' column of 'Generators and Scheduled Loads' tab.