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Australian Energy Market Commission
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Dear AEMC,

SA Water submission on AEMC, Five Minute Settlements Rule Change, Directions Paper

Thank you for the opportunity to comment on the AEMC Five Minute Settlement rule change directions paper, published on the 11 April 2017.

SA Water is a South Australian Government owned corporation that provides regulated essential water and wastewater services to the people of South Australia. The delivery of its services requires significant energy use. SA Water's electricity has been purchased on a spot price pass through retail contract since 2013.

Significant investment in systems, tools and operational practices have been made by SA Water to manage its energy costs for the benefit of our customers. SA Water actively manages energy costs through curtailment of consumption, generation of electricity from biogas and natural gas and mini-hydro facilities, hedge instruments and energy efficiency initiatives.

SA Water views this proposed rule change as a material change that will have a dramatic impact not only on itself but the broader market. SA Water's systems and infrastructure have not been established to respond immediately to high priced events. Due to the nature of the infrastructure and its uses, pump stations and treatment plants take time to change consumption in response to electricity prices.

A better understanding of how this proposed rule change will affect all market participants and the broader community collectively should be compiled before moving on in this consultative process. More extensive analysis and market modelling should be undertaken by the AEMC to ensure that market participants are fully aware of the impacts they will face.

Our main points for consideration are:

- Infancy of new technologies and its ability to replace base load generation
- Cost to deliver system augmentation for five minute settlement
- Impact to financial instruments via reduced market liquidity
- The unknown impact to the electricity forward price curve

We also believe that in time and through correct augmentation of the existing infrastructure and market systems a 5 minute market settlement system will be beneficial, however at this point in time the move to change the market settlement timeline requires further consideration, investment and market consultation.

SA Water has reviewed the directions paper and responded to the included questions, which are attached.

Kind regards



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Subject	Five Minute Settlement – Direction Paper Responses		

Five Minute Settlement - Directions Paper Responses

SA Water have provided responses to the supplied questions listed out in the AEMC five minute Settlement Discussion Paper.

Question 1

(a) How suitable is the proposed assessment framework for this rule change request?

We see this as a suitable framework for the undertaking of this rule change review. This is a discussion that all market participants will all need to have at some point in time given the fact that technological capabilities are fast outweighing the present systems.

AEMC have historically managed change management to Energy law via an effective market wide consultative process. The Commissions assessment framework of “3 dimensions of efficiency”; Productive, Allocative and Dynamic seem to outline all facets that would constitute an appropriate assessment of the impact of such a Rule change into an existing liquid market with defined market parameters that constitute the underlying back bone of its frame work.

(b) Are there any additional factors that should be considered in assessing this rule change request?

Practical options for participants should also be assessed along side theoretical/aspirational options e.g. it may ultimately be possible for demand side responses to occur within a 5 minute interval however this may not be currently possible. Under current rules, demand side responses within 30 minutes can manage price risks somewhat.

In addition, it is also possible that there will be unintended consequences that result from this change. How will these be identified?

Question 2

(a) How material are the price signal inefficiencies under 30 minute settlement and are there other data or data sources that would enable this issue to be more comprehensively addressed?

It is difficult to say whether the inefficiencies (such as generator price piling in or late bid retraction) constitutes general noise in market variability without comparing them to other “levers”. For example, in SA, the greatest price swings appear to be weather related, coupled with the fact that the market cap to floor price ratio is wildly disproportionate.

It would be illustrative to assess per region, the root cause of the 5 minute price spikes in order to understand whether they predominantly result from behaviour or natural variations in inputs to the forecasting process, this would help to assess materiality of improvements that could be made.

Is it possible for simulation modelling be done with credible commercially available software? Can the results of the modelling be made to the public audience?

(b) What extent would a move to five minute settlement address inefficiency in price signals from 30 minute settlements?

The change to a 5 minute settlement in the NEM would not necessarily address an “assumed inefficiency” in price signals from a 30 minute settled market. 5 minute price signals exist today, but how they come about, and when they occur in the 30 minute settlement timeframe, needs to be reviewed. Other questions related to how the Ancillary market manages the variation in frequency, will impact the settlement of generation in the NEM. A method to understand this issue would be to model this scenario, under a new set of bidding in good faith rules, to reduce the impact for price increases without physical demand change in the market.

With regards to new faster response technologies such as Batteries, it will be important to understand how price signals will be improved if there are large quantities of behind the meter response (intermittent generation and controlled fast start generation) that is not part of the dispatch and price settlement process.

(c) Are there any other inefficiencies that should be considered?

It is worth defining what factors are deemed to be “inefficient”. For example, bid piling under a negative price scenario aids to reduce a 30 minute settlement price which in turn, benefits the customers. Would this behaviour be deemed “efficient”?

Inefficiencies could also arise from the fact that there is a very low number of large scale rapid technology plants (such as Battery) able to match the generation capacity of existing/ retiring old fleet generation. The current mismatch in ramp up/down times potentially makes the market transition difficult and costly.

Question 3

How does an aging generation fleet together with rapidly evolving digital technologies and the increasing role of intermittent generation affect the prospects of five minute settlement as compared with 30 minute settlement?

As we progress from old to new generation technology, and the mix between baseload /intermediate/intermittent/response becomes more embedded and diverse, we would expect the variability of supply to be sufficient enough to meet the market demand at all times. Intermittent generation (such as wind) as well as technology for energy capture will need to increase, in order to manage security of supply for customers.

It is possible that businesses will become more vertically integrated on both side of the supply/demand cycle. In otherwords, the same technologies used by generators to manage rapid ramp up times will likely be the same technologies required for demand side participants to curtail load. How the system will reach an equilibrium in voltage and frequency management for both export/import of energy will be interesting.

Question 4

What kinds of generator bidding behaviours would emerge under five minute settlement as compared with 30 minute settlement?

AEMC (in support of the market participants) may need to model these scenarios.

Our viewpoint is that the bidding rules are in already line with a 5 minute market but may need to be modified to align with any new market parameters that arise from the change.

Question 5

(a)What other issues are likely to be material in considering the introduction of five minute settlement?

We believe the AEMC discussion paper highlights more of the current issues in regard to material impacts to generators/retailer/and consumers that will result in overall higher prices.

Potentially, both Supply and Demand side customers will need to rely more on AEMO's forecast dispatch engine. Will AEMO be upgrading their systems and forecasting capabilities in response to the move towards a 5 minute settlement environment?

(b) Is there other data or data sources that can better inform the analysis of the materiality of the problem with 30 minute settlement or the move to five minute settlement?

Question 6

(a) How material are the issues identified around demand-side optionality? Are there any material issues or benefits that have not been identified?

It will be material (in both cost and time) to upgrade meters, procurement and settlement procedures, curtailment options (for demand participants) etc. A 30 minutes derivatives settlement will (in most cases) also be lower than the 5 minute settlement.

(b) If demand-side optionality is adopted as a temporary measure, should the settlement residue be incorporated in intra-regional residue settlements? If not, how should it be treated?

It is hard to determine or estimate how it would work based on a concept, these concepts need to be placed in a testing scenario model, preferably in parallel to existing real time systems and analysed to see how they function and whether they are effective in managing the issue.

(c) How might the contract market react if demand-side optionality is adopted on a temporary basis?

We believe that the AEMC in conjunction with AEMO market data should conduct detailed modelling about how this process change with impact all market participants. This detailed should be presented before a temporary basis test is placed into the market.

Question 7

(a) Are there any suitable alternatives to collecting five minute data from the transmission network metering installations used to compile the NSLP other than reconfiguring or replacing the existing meters?

(b) What percentage of meters can be remotely reconfigured? What would this process look like and what would costs be? Conversely, what percentage would be need to be manually reconfigured or replaced?

Input from regional network operators and meter data providers would be able to substantiate this information more correctly represent a statistical response.

Internally, SA Water would need to audit some 1650 metering sites, of which 150 to 200 sites would need to be upgraded if possible, or replaced.

(c) The Commission has proposed aligning the transition with the timeframes for the NER test and inspection regime. Would this provide an appropriate amount of time for changes to occur?

The alignment of the 5 minute dispatch to 5 minute settlement system will require replacement of interval (Smart) meters which only read consumption data every 30mins. The alternative is to reconfigure existing meters to read at 5 minutes (if applicable). Several of our assets have older electricity meters (non-digital or cumulative digital). Companies may delay investment decisions to replace these meters to "smart meters", pending on the release of the new 5 minute meters as a result of the Determination of the 5 minute rapid response proposal.

(d) For which categories and situations should an exemption from providing five minute data be considered? Why?

For those that are not direct participants in the NEM.

(e) Are there any other metering implementation issues relevant to collecting five minute data that should be considered?

Demand side participants see an additional benefit in swapping up meters to the new 5 minute meters if they have Solar PV and Battery storage export (arbitrage) capability on their sites.

The percentage of meters to be replaced or reconfigured is unknown, but estimated to be significant because a 5 minute dispatch/settlement environment will mean that sub-metering of our assets will become increasingly important.

Question 8

(a) To what extent would a transition period mitigate the one-off contract negotiation costs of a move to five minute settlement?

We don't believe a transition period would reduce or mitigate one off contract negotiation costs. Those selling contracts will be managing a completely different risk position from past.

(b) What length of time would be appropriate to enable contracts to either expire or be adapted to take into account the future implementation of five minute settlement?

The ASX projects a forward trading position of up to 4 years, and we deem that this should be an adequate time frame to expire, adapt or transition towards a 5 minute settlement and contract settlement alignment.

Question 9

(a) To what extent would contract market liquidity be affected by a move to five minute settlement, as distinct from other pressures on liquidity?

The reduced liquidity in caps would potentially affect generators more than retailers. Augmentation of existing generation facilities to meet a five minute settled market could come at a cost to the Generator. This cost would pass through to the contracting entities and ultimately result in cost increases to the consumer.

Additionally, companies participating in SRAs and ASX traded hedge derivatives will be affected. The proposal to continue to settle these contracts on a 30 minute basis would be misaligned with everything else settled on a 5 minute basis, and therefore would be difficult to reconcile. With SRAs, a 5:5 minute dispatch to settlement environment could potentially work in our favour given larger interregional residuals would result. We do not anticipate the system of handling SRAs through the AEMO platform to change significantly.

The popularity of base load quarterly futures would fall in favour of shorter term (monthly) and smaller volume contracts. There is less incentive for companies to lock into quarterly products when large changes in the market could occur within the quarter under a 5:5 minute dispatch: settlement environment. Compared to a 30:30 environment, both supply and demand side companies would require a wider choice of products for increased agility to hedge against higher frequency changes in the spot market.

(b) How would the contract markets adapt to a move to five minute settlement?

(c) To what extent would new types of hedge cover emerge?

We would anticipate the rise in new (short term, small volume) products for companies on both sides to remain agile in effectively managing their hedge position. New products could be costly as they will arise from new technology generation that will need a different price point to be delivered. A \$300 cap may become a \$1000 cap for example.

(d) To what extent would existing generators develop new operating strategies to underpin hedge contracts?

We would expect base load operators to maintain a risk strategy that allows them to remain above marginal running costs. Any change to their cost structure to allow for rapid ramp up of dispatched energy would be factored into any new hedges offered to the market.

(e) To what extent would new generation plant be able to provide hedge contracts?

Leveraging from the response in (d), we would expect these new hedge contracts to be more expensive, small volume and shorter duration in order to cater for NEM participants seeking to protect against price spiking events.. The popularity of peak contracts could rise as opposed to base contracts.

Question 10

(a) What are the costs, synergies and risks involved in upgrading IT systems to accommodate five minute settlement?

(b) What timeframes are required to upgrade IT systems?

Question 11

(a) Are there any further categories of costs that would be incurred if five minute settlement was adopted?

Much of the aforementioned costs in the Directions paper are outside the company Budget. Larger companies may/may not be able to absorb the cost of software/hardware upgrades by juggling their current portfolio positions whereas smaller to medium sized companies may need to look at capital raising options. There are also hidden costs of companies delaying investments for software/hardware upgrades and staff hire, pending on the Determination of this proposal.

Has this been addressed in the Federal Budget? How likely will companies be assisted by government to be able to move towards a 5:5 minute dispatch: setlement environment?

(b) How suitable is the proposed two-stage transition period to implement five minute settlement? Do you consider there to be a more preferable approach to a transition period such as alternative timeframes?

Modelling of the Proposed two-stage transition is one way to show market participants how the benefits of moving to a 5 minute settlement will outweigh the cost of implementation. Whether this is suitable will depend on how the modelling will display the impacts to the system through transition from the existing systems via the 2 stages to the final 5 minute market settlement system.

(c) What are the detailed benefits, costs and risks of the proposed two-stage transition to five minute settlement on:

- (i) existing contract arrangements?
- (ii) metering requirements?
- (iii) IT system requirements?

(d) Are there any other practical aspects of implementing five minute settlement that should be considered?

The below viewpoint addresses an alternative approach in utilising the FCAS market to transition new technology generation as an interim measure, into the NEM:

After reviewing the current Discussion Paper and associated documentation, we feel there has been much emphasis on battery technology as being the new technology that the current market settlement system needs to accommodate for.

We understand that to create investment in this sector, relevant price signals are needed to encourage investment. Presently, very little large scale battery plants are in place, and many are under conceptual stages awaiting financial backing.

An alternative solution to bring new generation into the market is to review whether the current NEM ancillary market is able to meet the needs of a 5 minute market settlement.

Given the current ancillary market is already in place to manage frequency and thus system security across the NEM, we would see this as an interim response to managing a change to the existing system, that is not really at the door step of a fundamental change now, or in the next few years.

Kind regards,

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