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Mr John Pierce
Chairman
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Dear Mr Pierce

Re: Draft Rule Determination – National Electricity Amendment (Bidding in Good Faith) Rule 2015

Sun Metals welcomes the opportunity to respond to the draft determination on the Bidding in Good Faith Rule change proposal.

Strategic late bidding by a generator is a business decision. Under the current Rules it is:

- Not prevented by the existing bidding in good faith provisions
- Incentivised for some participants by the market settlements arrangements and
- Facilitated by an inadequate amount of fast supply and demand side response in the NEM, and in some regions, by inter-regional network congestion and lack of competition in the market.

While we agree with the AEMC that the Rules cannot compensate for a non-competitive industry structure, it is entirely appropriate for the Rules to remove inefficient market distortions created by the market structure, that:

- Inhibit the participation of fast supply and demand response services – particularly short duration technologies / techniques;
- Reduce the liquidity of the financial market, thereby limiting customers' ability to manage risks; and
- Produce prices that do not reflect the underlying supply and demand balance.

In this submission we make the case that the AEMC's proposed solution is not sufficient and that implementation of 5 minute settlement for generators, and optional 5 minute settlement for customers, as contemplated in 2002 would both complement and strengthen the measures currently proposed by the AEMC.

Proposed AEMC solution is not sufficient

There is considerable uncertainty around whether the AEMC's proposed change to the good faith provisions to *not making bids that are misleading* would provide an effective deterrent to strategic late rebidding. The AEMC believes that this formulation would be easier to prove in court, but the fact that it would need to be tested in court means that there is no certainty that contravention of the provisions would be met with penalties. It will also potentially be costly for the AER to make and defend its position, which will naturally tend to cause it to err on the side of caution, where there is any doubt about proving its case.

Requiring the generator to write a report to justify its late rebidding places a regulatory cost on all generators whether they rebid in accordance with the Rules' intentions or not. However, it is unlikely that the burden of writing a report would be sufficiently costly or risky to deter the rebidding behaviour that is detrimental to the market operation.

Therefore, the AEMC proposal does not provide a sufficient disincentive to strategic late rebidding.

Incentivising appropriate behaviour is more effective than threatening to punish bad behaviour

The AEMC's proposed approach based on punishment for bad behaviour is likely to be less effective than incentivising appropriate behaviour or dis-incentivising poor behaviour. This is particularly valuable when the impact of the incentive / dis-incentive is immediate and definite unlike the deferred and uncertain impact of punishment.

Putting that another way:

Changing the market structure to reduce the benefit of bidding behaviour that is contrary to the achievement of an efficient market, in parallel with the proposed AEMC changes, would strengthen the AEMC's solution.

Solution should promote an efficient market not distort it further

One of the options put forward and discussed extensively by respondents was a gate closure mechanism to limit the ability of generators to initiate bids close to dispatch such that other market participants are unable to respond in time.

While gate closure would give more time for participants to respond, it would also distort the market further away from the five minute dispatch model.

There are technologies available that are capable of responding in a single 5 minute dispatch interval, such as batteries, loads with fast control systems set up to respond to market prices, and some flexible alternating current transmission systems (FACTS) and direct current transmission systems. As solar systems with battery storage become less expensive these systems could potentially participate in the market as fast response generators. Some Participants are actively experimenting with fast generation response from solar-battery hybrid storage systems and fast demand response from household load management systems. Air-conditioning loads are particularly suited to short-duration demand response systems. Large industrial loads, like ourselves and gas industry participants may also be capable providing 5-minute demand side response, collectively sufficient to moderate regional spot market volatility.

However, with the current 30 minute settlement arrangements, there is little incentive for fast response technologies to enter the market, because:

- Generators receive the average price of generation over a full interval. If fast generation is scheduled for one or two dispatch intervals on the basis of a high price bid, it is paid the average spot price over the 30 minute trading interval, for the dispatch over the two intervals in which it participated. The average price may not be sufficient for investment in fast response generation, or for operation of existing fast response generation.
- Likewise loads pay across the whole interval the average price; even if they respond to the price spike to reduce output, they are unable to reduce their output on past dispatch intervals. Additionally, in our case, we are incentivised to restrict load over the whole 30 minute trading period, and even subsequent trading periods, rather than risk paying high prices for the whole period. This latter scenario is clearly a poor outcome for the market, for the customer and for the economy as a whole, since load is normally a consequence of production.

A gate closure process would provide more notice of price spikes, and therefore provide more opportunity for some generators and loads to respond. However, it might restrict the market's ability to respond effectively to changes that occur on a short time frame, such as extreme wind events that cause rapid changes in wind farm outputs. It would also restrict the ability of Participants to respond to changes in market dispatch that occur in near-dispatch timeframes.

5 minute settlement complements and reinforces the AEMC's bidding in good faith proposals

Sun Metals submits that it is time to revisit the 5 minute settlement option that was the preferred option considered by AEMO in 2002¹. The work ROAM and Oakley Greenwood undertook for the AEMC bidding in good faith Rule change suggests that more recently there are more widespread occurrences of late bidding, and rebidding towards the end of trading intervals, in Queensland and South Australia.

Changing to a 5 minute settlement price helps remove the financial advantage of strategic late rebidding, as the price is only applicable for 5 minutes and does not increase the price of previous dispatch bids within the 30 minute trading interval. Even if no demand participants change their pricing to 5 minute dispatch, this change will help to remove an inefficient market distortion created by the market structure. It will help to create a more competitive market where fast response generators are rewarded for the actual time they are participating in the market. The flow-on effect may be a moderation in prices if more fast-response generators are ready to dispatch, as they wait for a price spike where they could be remunerated up to 5 times more than they have in the past, thus competition is strengthened.

¹ NEMMCO "5 Minute dispatch and 30 Minute Settlement Issue: Draft Final Report", Version 1, 19 June 2002

The preferred option – *5 minute dispatch with simulated 5 minute settlement* – was described in the AEMO 2002 report as follows:

Table 1 5 Minute dispatch, simulated 5 minute settlement process – 2002 Assessment

Affected function	Description of impact
Metering Arrangements	
Meters	<p><u>All Participants:</u> No change from existing NEM 30 minute interval meters.</p>
	<p>Simulated 5 minute settlement energy data produced for Market Generators, MNSPs and <i>optionally</i> for Market Customers by profiling the 30 minute interval meter data with aggregated 5 minute SCADA data.</p>
Optional 5 minute meters	<p>Participants partaking in the simulated settlement regime and market customers may opt (at their own cost) to install 5 minute interval metering if they consider that they require a greater level of profiling data accuracy or reliability than that afforded by SCADA data.</p>
Settlement Calculations	<p><u>Generators, MNSPs and Market Customers who opt for 5 minute interval metering:</u></p>
	<p>Complete 5 minute settlement. This means that volume generated or consumed in a 5 minute interval (as read by 5 minute interval meters) are settled using the 5 minute ex-ante dispatch price applicable to that 5 minute interval.</p>
	<p><u>Other Generators and MNSPs (default 30 minute interval metering):</u></p>
	<p>Default settlement arrangement is simulated 5 minute settlement². This means that SCADA data is used to profile existing 30 minute metered energy data into a 5 minute profile for a trading interval. A simple settlement adjustment factor is then calculated for each meter. The profiled five minute volumes generated or consumed at a meter are then effectively settled through this methodology using the 5 minute ex-ante dispatch price applicable to each 5 minute interval. This achieves simulated 5 minute dispatch and settlements with settlement outcomes for these participants being the same as for full 5 minute settlement.</p>
	<p><u>Remaining Market Customers (default 30 minute interval metering):</u></p>

² That is, where participants do not opt to install 5 minute interval meters.

	These customers do not participate in simulated 5 minute settlements. The settlement regime remains unchanged with settlement occurring using 30 minute time weighted average pricing and 30 minute interval metering data. The settlement imbalance that is created by this option is recovered ³ entirely from these participants (pro-rated by energy) with a settlements levy or new ancillary service.
Ancillary Services	Existing market FCAS services and their cost recovery mechanisms are unchanged by this option. An additional ancillary service may be established under this option for customers not participating in simulated 5 minute settlements to account for the settlements imbalance created by the different settlement methods. In this way the settlements imbalance would be passed through to end users as an ancillary service.
Energy Market Prices	Prices published for the energy market will be unchanged from existing market arrangements. NEMMCO will publish the following prices for each trading interval: <ul style="list-style-type: none"> • 5 Minute Dispatch prices • 30 minute time weighted average price

In this proposed implementation the key time periods for dispatch and settlement were unchanged i.e.:

- Dispatch period for energy 5 minutes;
- Spot Market Settlement period 30 minutes;
- Financial market contracting period 30 minutes.

Cost of implementation is much lower than 2002 solution identified

At the time this market mechanism was investigated, it was not implemented because the net costs were thought to exceed the benefits. The net present benefits calculated through market modelling ranged from \$28.8 million to \$48.9 million (mid 2002 dollars, assuming 7% IRR, 10 years) for a range of scenarios, and the costs of \$160.2 million using the same assumptions. Note that 95% of costs related to implementation by retailers.

Retailers were surveyed, and appear to have been asked to estimate the cost to implement this scheme. The key question that they responded to was:

“What incremental (net) costs would be incurred by your business as a result of implementing and operating the new arrangements?”

It appears that the retailers were not asked *if* they would participate given that this is an optional scheme.

Since the active participation by retailers in 5 minute settlement is voluntary, we contend that **retailers would only participate in 5 minute settlement if the net benefit to them were**

³ The 2002 NEMMCO draft final report uses the term “recovered”. However the 30 minute settlement might deliver a positive imbalance or a negative imbalance, and therefore recovered could be positive or negative.

positive. Voluntary costs that are only incurred when a business will receive a net benefit should not be taken into account in the calculation of nett market benefits.

Our discussions with retailers suggest that most retailers are unlikely to opt into the 5 minute settlements process at this stage. Our discussions confirmed that most of the large costs identified by AEMO in the 2002 investigation would only be incurred if the Retailer opted into the 5 minute settlement process.

Some retailers expressed concern about the materiality of settlement residue under the 5 minute dispatch with simulated 5 minute settlement proposal. To test the materiality of the settlement residue we examined market data from Queensland in January 2015. Analysis of this market data indicates that if generator bidding and load usage were unchanged from the current pattern, and all loads were calculated on a 30 minute basis, all generation on a five minute basis, the difference in AEMO money received from market customers and money paid to generators across the whole of Queensland would be less than 0.3% of settlement. Settlement residues from this process could be combined with the existing intra-regional settlements residue, in which case no changes would be required to retailers' systems to manage the residue.

Nevertheless there will be some costs to retailers regardless of whether they actively participate in the scheme or not, to monitor the market when the scheme is implemented, and to manage their risk. These costs are likely to be not more than incurred by generators. Therefore we believe that a reasonable assumption is that retailer costs are not more than the costs to generators, who have no choice but to participate under this proposal, amounting to \$2 million in aggregate upfront costs and \$0.2 million per annum ongoing.

Converting to 2015 dollars this equates to:

Table 2 Present value of implementation costs assuming generator and retailer costs are the same

	Upfront costs	ongoing annual costs	pv
Generators	2.78	0.278	
Retailers	2.78	0.278	
AEMO	1.39	0	
MNSP	0.139	0	
Total PV	\$7.09	\$0.56	\$10.27

Clearly there are assumptions in this analysis that need to be more fully investigated, however we anticipate that IT costs, particularly in relation to data storage and hardware have *dropped* significantly in the intervening period.

(Optional) Metering 5 minute data

Our investigations to date suggest that for those participants who choose 5 minute metering the upgrade costs for two meters would be around \$4000 to \$5000 or \$30,000 to replace the whole meter. Implementation of 5 minute metering is optional under the proposed simulated 5 minute settlement process, but it is likely that some Participants (Generators or Customers) would prefer the improved reliability of meter data over SCADA. The need to upgrade meters seems to be related mainly to a requirement for 35 days data storage NER Clause 7.3.1 (a)(10). The AEMC could consider whether the current requirement for 35 days of data storage is necessary, or if a shorter storage record would be appropriate.

There would also likely be some associated cost to Metering Data Agents to upgrade to a new meter data format, as the current NEM12 format does not cater for 5 minute meter data. We assume that upgrade of the aseXML standard would be accounted for in the AEMO costs, and we note that some metering related costs were included under Retailer costs in the 2002 proposal.

Benefits from the implementation of 5 minute simulated settlements

Assuming a direct conversion of benefits identified in 2002 to March 2015 dollars for a range of benefits from 27.5 to 45 Million the net benefits range from \$17 million to \$35 million. Examination of published actual volatility factors between 2001/02 and 2013/14⁴ suggests that volatility in each region of the NEM varies from year to year but the trend in volatility across the NEM is not significantly different in recent years from 2001/02. This suggests that benefits of implementing the simulated 5 minute settlement will be of the same order today as they were in 2001/2 for the same range of demand assumptions⁵.

Table 3 Net benefits, assuming retailer and generator costs are the same (in \$M at March 2015)

	PV	case	Net Benefits
Lowest benefits	27.5	medium demand	\$17.23
Highest benefits	45	high demand	\$34.73

The benefits attributed to the scheme are likely to be conservative (low), because it is unlikely that the market benefits calculated include the impact on the liquidity of the financial

⁴ <http://www.aemo.com.au/Electricity/Settlements/Prudentials/Credit-Limit-Procedures-Supporting-Information>

⁵ We have not been able to source the original MMA market benefits analysis to ascertain how the demand response was treated in this study. Our investigations suggest that only a small subset of Customers would choose to opt in to the 5 minute settlement process, at least in the short term. It is possible that the MMA analysis assumed that all Customers would participate (noting the high Retailer costs). However, only a small proportion of loads are fast-response, and we have assumed that these are the ones that will choose to opt in to the 5 minute settlement process, and they (along with the generators) will be the ones that influence market benefits of the proposed scheme. Therefore we deduce that the market benefits will be similar, regardless of the assumption about the uptake of Customers in the optional 5 minute settlement process, provided that assumption about the magnitude of fast response load in each region is similar.

market, or the competition benefits associated with reducing the market power impacts currently observed in the market⁶.

It is therefore likely that a reassessment of net market benefits, if it were undertaken today, would demonstrate a positive outcome.

Impact on participants from implementation of 5 minute simulated settlements

The example in Table 4 shows the impact on generator payments if a generator reduces its output in the sixth dispatch interval, forcing up pool prices.

Table 4 Example – Generator trip or capacity withdrawal in 6th interval – benefits under current arrangements

5 minute interval	1	2	3	4	5	6	
Pool Price (\$/MWh)	50	50	50	50	50	5000	Average pool price 875
Generation (MW)	500	500	500	500	500	0	
Energy (MWh)	42	42	42	42	42	0	Total 208
Payment received under current arrangements	$= 208 \times 875 = \$182,291$						
\$							
Payment received under proposed arrangements	$= (42 \times 50) \times 5 + 0 = 208 \times 50 = \$10,400$						
\$							

⁶ We contacted AEMO about the 2002 study, but they were unable to provide the results from the original Registered Participant survey, as the material has not been retained. While we have not seen the MMA report, it is unlikely that market modelling would extend to the modelling financial market. Competition benefits have been discussed for many years, but only in recent years has a methodology for estimating competition benefits been implemented in calculations of market benefits for the NEM. See for instance, "QNI Upgrade Competition Benefits Methodology Consultation Paper" 2013 <http://www.transgrid.com.au/network/consultations/Pages/CurrentConsultations.aspx>.

Clearly in this example the level of incentive for 6th interval rebidding to manipulate the market is reduced under the five minute settlement arrangement.

In the event that the generator is able to continue generating at the same level (Table 5), the generator's payment is the same under the current and proposed arrangements. Similarly if a load does not change its output, net impact of changing arrangement is zero.

Table 5 Example - Generator output unchanged

5 minute interval	1	2	3	4	5	6	
Pool Price (\$/MWh)	50	50	50	50	50	5000	Average pool price 875
Generation (MW)	500	500	500	500	500	500	
Energy (MWh)	42	42	42	42	42	42	Total 252
Payment under current arrangements	$= 252 \times 875 = \$220,500$						
\$							
Payment under proposed arrangements	$= (42 \times 50) \times 5 + 42 \times 5000 = \$220,500$						
\$							

Table 6 illustrates the impact on a fast start generator, with a high operating cost which makes it uneconomic to operate at \$50/MWh.

Table 6 Example Fast response generator

5 minute interval	1	2	3	4	5	6	
Pool Price (\$/MWh)	50	50	50	50	50	5000	Average pool price 875
Generation (MW)	0	0	0	0	0	500	
Energy (MWh)	0	0	0	0	0	42	Total 42
Payment under current arrangements	$= 42 \times 875 = \$ 36,750$						
\$							
Payment under proposed arrangements	$= 42 \times 5000 = \$210,000$						
\$							

The fast start generator receives a much lower price than its bid price, under current arrangements. Current arrangements clearly provide a disincentive to investment in fast start generation.

Similarly current arrangements provide a disincentive to investment in fast demand response as illustrated in ~~Table 7~~Table-7.

Table 7 Fast response load

5 minute interval	1	2	3	4	5	6	
Pool Price (\$/MWh)	50	50	50	50	50	5000	Average pool price 875
Demand (MW)	500	500	500	500	500	0	
Energy (MWh)	42	42	42	42	42	0	Total 208
Payment made under current arrangements	$= 208 \times 875 = \$182,291$						
\$							
Payment made under proposed arrangements	$= (42 \times 50) \times 5 + 0 = 208 \times 50 = \$10,400$						
\$							

Fast generation and fast load response acts to moderate price spikes in the market. The disincentives for investment in fast start generation and fast demand response mean that the efficient levels of these technologies that would otherwise be developed in the market are not present in the current market. The proposed 5 minute settlement option described above would reduce the distortion in the market, and provide the appropriate level of incentives for efficient investment.

The proposed 5 minute settlement would therefore also moderate price spikes, reducing the impact of late rebidding on the whole market. This would benefit all customers, including those who do not choose to participate actively in the 5 minute settlement process.

The availability of a higher level of fast start generation would also provide greater opportunity for financial products that enable customers to mitigate their financial risks.

Financial Markets

Since the proposed Rule change features an optional 5 minute settlement for Customers, the conventional 30 minute two-way swap settlement process would continue to work effectively for both generation and loads.

Gradually, as market customers opt for a 5 minute settlements, there will be an opportunity to offer hedging instruments with similar pricing terms embedded within them. For instance, 5

minute caps may develop, where quick start generation would offer this product to quick demand response participants.

Summary

In summary, we have made the case that:

The proposed changes to the wording of the bidding in good faith provisions are not sufficient to eliminate the bidding behaviour that the AEMC has identified as being detrimental to a competitive National Electricity Market.

The proposed reporting mechanism to allow the AER to investigate late rebidding imposes a burden on generators, even if they are rebidding appropriately. The importance of reporting is magnified if the AER has solely to rely on the bidding in good faith provisions to enforce the intent around late rebidding.

The most effective means of addressing late rebidding, rather than attempting to detect and penalise inappropriate bidding behaviour, is to remove the incentive for it, and rebalance the market by fostering an appropriate level of fast demand-side and fast generation response to enter the market.

Implementing a 5 minute settlement process would do this, but to keep the implementation cost to the market as low as possible we recommend that the AEMC revisits the 2002 opt in proposal for 5 minute dispatch and 5 minute simulated settlement.

Yours faithfully,



Yun Choi

CEO Sun Metals Corporation Pty Ltd