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

Submitted via www.aemc.gov.au

22 May 2014

Dear Mr Pierce,

Submission on bidding in good faith rule change request (ERC0166)

EnerNOC is grateful for the opportunity to comment on this rule change request.

EnerNOC is an energy management company, currently managing over 24 GW of load sourced from over 14,000 commercial and industrial sites across markets in North America, Europe, Australia, New Zealand, and Japan. As well as offering much of this load into energy, capacity, and ancillary services markets of varied designs, we also assist customers in improving their efficiency and minimising their spending on energy.

We address the underlying principles first, then answer the specific questions posed in the consultation paper, and finally offer a suggestion for improved auction design.

1 Late strategic bidding has no place in an efficient energy market

The Commission correctly identifies the key problem with late strategic rebids: that no party is able to respond to them. Rebidding does lead to improved efficiency, so long as all parties are able to respond to rebids.

Given the opportunity to respond:

- Other generators would rebid competitively, which would often prevent the spike in prices.
- Spot-exposed consumers would curtail their consumption in response to the price signal, avoiding exposure to the high price, and probably also reducing the price.

Neither of these responses would strictly be an efficiency improvement, as these resources presumably have higher costs than the generator that is bidding

strategically. However, these responses would prevent the perpetrator from being rewarded for its actions, and hence inhibit this undesirable behaviour.

It is only because the perpetrator knows that other parties cannot respond that late strategic rebidding works.

2 Late strategic bidding does not provide any useful investment signal

Price volatility, including excursions to prices far above variable operating costs, is a necessary feature of an energy-only market. It provides an investment signal for new capacity both directly and through increased hedge prices and increased willingness of consumers to buy hedges.

It is often argued that any reforms which will act to reduce price volatility are hence damaging to the efficient operation of the market. This is not the case with late strategic rebidding, because the price excursions are not providing any useful investment signal.

Investment signals can be considered as acting in two ways: through the spot market alone, or through the financial contracts markets:

2.1 The apparent investment signal in the spot market serves no purpose

Generally, high average spot prices are an investment signal for baseload resources, whereas extreme price excursions are an investment signal for peaking resources. Hence the isolated very high price intervals that result from late strategic rebidding appear to provide an investment signal for peaking resources.

However, there is no shortage of peaking capacity at the time of these events. Crucially, if more peaking generation were to enter the market in response to these price signals, it would not inhibit the ability of the perpetrator to use late strategic rebidding to cause price excursions.

This is because late strategic rebidding is typically employed at times of low prices, when peaking resources are not needed and hence not running. When a price spike occurs, the peaking resources that are not running do not benefit. Some peaking resources may be dispatched in response to the price spike, but their required start-up times usually result in them having no effect on price in the relevant interval, and earning no revenue from it.[1]

If the "investment signal" continues regardless of the amount of resulting investment, it is not an investment signal at all.

[1] Peaking generators will typically have a minimum run time which obliges them to generate for much of the next trading interval. Since prices are typically very low in the trading interval following an isolated price spike, they will do this at a loss. Peaking resources therefore put considerable effort into avoiding being dispatched in response to isolated intervals, by bidding their capacity near the market price cap when they consider it unlikely that there will be a genuine tightness in the supply:demand balance. This exacerbates the steepness of the offer curve.

2.2 *The apparent investment signal in the contracts markets serves no purpose*

The occurrence of price excursions leads to consumers and retailers wanting to buy hedges to protect themselves from exposure to the high spot prices. Persistent high average prices lead to demand for futures/swaps; occasional extreme prices lead to demand for cap contracts.

A new entrant peaking resource typically sells cap contracts to hedge much of its capacity. This fits naturally with their role of providing insurance against high price events: the payouts required on the cap contracts as a result of high price events should closely match the revenue from the spot market during those events, less the peaking resource's variable operating costs. The hedge premium can then cover the resource's fixed and financing costs and provide a return on investment.

As discussed in section 2.1, a new peaking resource is likely to earn no spot market revenue from a price excursion that is caused by late strategic rebidding. And yet, since a high trading interval price results, they will have to pay out to buyers of cap contracts. This leaves them with an unhedgeable exposure: having a peaking resource does not help at all in covering these events.

The owner of the hedged peaking resource is hence obliged also to provide purely financial insurance against these events – it is not a form of hedging for them. They must make provision for their expected losses from such events when determining the price at which they are willing to sell a cap contract.

So, although late strategic bidding does increase demand for hedges, which would normally be considered to be an investment signal for peaking resources, in this case the investment signal is spurious.

3 This is a separate issue from economic withholding or transient pricing power

In its review last year of potential generator market power, the Commission stated its view as follows:

> "In a workably competitive market it is expected that firms display profit maximising behaviour, seeking the widest possible margin between prices and their underlying costs. Pricing behaviour is disciplined by the threat of new suppliers entering the market in response to price signals and consumers exercising choice."[2]

The problem with late strategic rebids is that consumers are unable to exercise choice, and new suppliers entering the market would make no difference to this pricing behaviour. Hence there is no prospect of "workable competitiveness" around these actions.

This differs from transient pricing power. In that case, a participant takes advantage of an existing tight supply:demand balance which renders their capacity

[2] AEMC, *Potential Generator Market Power in the NEM,* Final Determination, April 2013, p.19

pivotal, and practices economic withholding to maximise their returns. While this behaviour would be considered gaming in many markets, it is accepted in the NEM. In contrast, with late strategic rebidding, the participant is able to cause the transient on their own initiative, by exploiting timing issues.

This ability to manufacture an acute pricing issue is a flaw in the market design. It is particularly odd that baseload generators, with very slow ramp rates, should be able to cause a sudden, unforecastable spike in prices.

The immediate problem is that no other participants can respond. However, even if this were solved, it would still be anomalous that other participants would have to respond extremely quickly to avoid exposure. This is a result of the market design conflating price discovery for predictable aspects of the supply:demand balance with the ability to respond to unpredictable changes in the supply:demand balance. Our response to Question 2 explores this issue further.

4 Direct impacts of late strategic rebidding

Late strategic rebidding causes price spikes to which neither consumers nor other generators can respond. This directly causes wealth transfers to the perpetrator and other generators which happen to dispatched at the time from:

- Consumers, and
- Peaking resources that have sold hedges but do not happen to be dispatched to their hedge level at the time.[3]

It is traditional to consider the efficiency of the market in a narrow sense and hence ignore wealth transfers. However, in the broader context of the National Electricity Objective, the "long-term interests of consumers of electricity with respect to price" are important.

If these wealth transfers were providing a useful investment signal, then that may be considered to be in consumers' long-term interests. However, as discussed in section 2, they do not provide a useful price signal; they're just a wealth transfer. Hence they are against consumers long-term interests, and detrimental to the NEO.

[3] As discussed in section 2.2, these peakers must make payments to hedge purchasers for these events, but have no corresponding earnings from the spot market. These payments will be used by hedge purchasers to pay the inflated spot price.

5 Consequential impacts of unmanageable volatility from late strategic rebids

The consequential impacts may be more significant:

5.1 It inhibits demand-side participation

Even if a spot-exposed customer could respond instantly and perfectly to price signals as soon as they are published, they could not escape exposure to the very high prices that result from late strategic rebidding combined with the 5/30 anomaly. This severely reduces the attractiveness of such arrangements.

The presentation by Visy at the AEMC stakeholder forum in Melbourne on 5 May 2014 provided evidence of this. Visy is a very sophisticated customer. It tried to participate in the market in Queensland through spot price exposure combined with demand response, but the unpredictable volatility due to late strategic rebidding by generators forced them to abandon the exercise.[4]

The effect of customers abandoning (or never starting) market participation is twofold:

- It lessens competition in the wholesale market.
- It increases the demand for financial hedges.

5.2 It deters investment in peaking resources

As discussed in sections 2.1 and 2.2, late strategic rebidding results in high price events, the value of which cannot be captured by peaking resources. This reduces the attractiveness of investment in peaking resources, as it reduces their effectiveness as a hedge against spot exposure, and hence is likely to skew investment away from the most efficient long-term resource mix.

Reduced investment in peaking resources has two effects:

- It lessens competition in the wholesale market.
- It reduces the supply of financial hedges.

[4] The late strategic rebidding in Queensland this year seems particularly blatant. Consider, for example, 21 February 2014. There were six dispatch intervals with prices above $11,000/MWh. **Each of them was the final dispatch interval of a trading interval**, with the other dispatch intervals in the trading interval being below $65/MWh. These were the only dispatch intervals on that day with prices above $500/MWh, and the only trading intervals above $120/MWh. None of these high prices appeared in 5-minute predispatch forecasts (other than the final one, which is published at the start of the dispatch interval), so there was no way for customers to anticipate them. The AER's *Electricity Report 16 to 22 February 2014* shows (pp.10-12) that each of these high price intervals resulted from generators rebidding capacity from low price bands to very high price bands **for a single dispatch interval alone**. In several cases, multiple generators carried out similar actions at the same time, giving different reasons. None of the reasons seem to justify rebids that affected only a single dispatch interval, rather than an extended period, and there is no obvious reason why relevant events would always occur shortly before the end of a trading interval. This suggests that the reasons stated for compliance purposes were simply random events that happened to occur at times when the traders want to submit a late strategic rebid.

5.3 It reduces the accuracy of predispatch price forecasts

Another way of looking at these unpredictable price spikes is that they reduce the accuracy of predispatch price forecasts, on which peaking resources depend for accurate dispatch and customers depend for efficient consumption decisions.

Compared to other sources of inaccuracy in predispatch price forecasts – such as unscheduled generation and price-responsive demand – rebids have a much more serious effect. This is because they change the shape of the supply curve, rather than merely shifting the point at which demand intersects it (in just the same way as random variations in demand).

5.4 It increases risk management costs for all participants

Since late strategic rebidding leads to more price spikes, it leads to higher costs for participants in two ways:

- Higher hedge prices.
- Increased prudential requirements.

6 Responses to consultation questions

Our answers to the relevant questions in the consultation paper are below:

Q1 Do you consider late strategic rebidding to be the primary issue raised by this rule change request?

Yes.

Q2 Do you consider the NEM trading arrangements of five-minute dispatch and 30-minute settlement to be relevant to the issue of late strategic rebidding? Do you have any views as to how any issues arising could be addressed?

Yes. It exacerbates the problem by allowing late strategic rebids to set prices for a longer period without other participants having any opportunity to respond. It also allows the perpetrator to affect the price that applies for 25 minutes leading up to the high-priced dispatch interval, during which time they can be generating at full output on the basis of their previous bid.

Due to the 5/30 anomaly, prices are non-causal: a rebid or other event at 9:23am can cause the trading price to increase with effect from 9:00am. The price that applies from 9:00am is only known shortly after 9:25am.

This is nonsensical. For customers to respond to a price signal, they have to be aware of it. It is hard to think of any other commodity for which the consumer is only told the price after they have consumed; such a practice could be expected to provoke outrage.

Consider the hypothetical ideal spot-exposed price-responsive consumer, who is able to stop consuming instantly when a very high price is published. Due to the 5/30 anomaly, if the high price is for the final dispatch interval of a trading interval, this customer will be exposed to a high price for 25 minutes of consumption, despite its instant response: there is no *actionable* price signal.

In effect, the 5/30 anomaly reduces the price elasticity of demand with respect to the final dispatch interval price by 83%, because 25 of the 30 minutes of consumption to which the price will apply have already happened. This reduction in elasticity is then compounded by the muting of the strength of the price signal due to 30 minute averaging.

Aligning dispatch and settlement periods – for example by moving to 5 minute settlement, or 30 minute dispatch, or some compromise in between – would fix this issue for this hypothetical ideal consumer: so long as they are notified of the price at the beginning of the period to which it applies, then they can avoid exposure to the high price, and only consume when it is efficient for them to do so.

It seems an important principle that it should at least be possible for such an ideal consumer to be able to avoid consuming at times of high prices.

As well as exacerbating this issue, the 5/30 anomaly:

- Distorts price signals, leading to inefficient dispatch, such as high-cost resources "piling in" to take advantage of a high trading interval price after the problem of insufficient supply has already been resolved. This also complicates the management of transmission constraints.
- Undervalues the ability to respond quickly, which in the short term reduces supply and demand elasticity, and in the long term distorts investment decisions away from highly responsive resources.
- Requires significant effort from participants to work around, through a large number of rebids. Scheduled peaking resources seek to avoid being dispatched for isolated high price dispatch intervals, where the trading price is likely to remain below their variable costs. They do this by offering their capacity near to the price cap whenever they think it unlikely that there will be a sufficiently long run of high dispatch prices, and continually rebidding as their expectations change.
- Leads to a very steep supply curve, due to the rebidding to work around the anomaly, and hence to larger price excursions than necessary when there is an unexpected change to the supply:demand balance. This increases price volatility and hence the costs of risk management for all participants.

This issue has been raised since before the start of the market. NEMMCO looked at it in detail in 2001-2003.[5] However, only a limited range of solutions was investigated, the market modelling was limited and highly controversial, and retailers submitted inexplicably high cost estimates for a simple solution. Although NEMMCO concluded that the costs of fixing the problems exceeded the benefits, the majority of submissions questioned this conclusion.[6] It would be worthwhile to re-examine this issue, considering a broader range of possible solutions, and assessing them more robustly.

However, such a reform would not solve all of the timing issues. Late strategic bids would still be possible, and customers who could not respond instantly would still be exposed. In addition, only generators that could start immediately or ramp up very quickly would be able to provide a competitive response to such rebids.

This is because the design of the market does not separate out price discovery for predictable demand from the ability to respond quickly to unforeseen events. It is this lack of separation that late strategic rebids exploit: a slow-ramping baseload generator can, through such a rebid, cause an event that can only be mitigated through a very fast response.

This problem can be overcome by moving to a dual-settlement market design: a forward market which solves unit commitment issues, combined with a balancing market which manages unpredictable variations. We discuss this further in our response to Question 6.

Q3 Do you consider there to be benefits in the proposed rule to reverse the onus of proof onto generators?

Yes. However, a better balance between the effectiveness of the regulation and the compliance burden could be achieved by applying a progressively higher burden of proof to participants as the time of dispatch nears. To put it another way, there is no need to apply such heavy scrutiny to bids that are submitted well in advance of the trading interval they affect, as all other participants (including consumers) are free to respond to those.

However, we are sceptical about the potential to regulate rebidding in this way. In the NEM, there seems to be no clearly defined line between legitimate bidding strategies that participants can pursue to maximise returns and what should be considered to be gaming. Experience shows that, wherever there is any kind of ambiguity, the highly creative, intelligent, and motivated traders will push at the boundaries, making consistent monitoring and enforcement extremely challenging and resource intensive.

As a result, it is better to minimise the need for regulation by getting the structure right so that opportunities and rewards for gaming are minimised.

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[5] See NEMMCO, *5 Minute Dispatch and 30 Minute Settlement Issue*, Draft Final Report, June 2002.

[6] Dissenting submissions included those from the National Generators Forum, Hazelwood Power, Snowy Hydro, Southern Hydro, Hydro Tasmania, and TXU.

Q4 Do you consider that all known conditions and circumstances should be taken into account in generator bids and rebids? Do you consider the proposed rule to be practical and sufficiently clear as to when a generator must rebid following a change in material conditions and circumstances? Do you consider that rebids should only be limited to the occurrence of a significant change in conditions and circumstances? If so, how would this be achieved in practice?

If we are to attempt to control bidding behaviour through regulation, rather than design, then we will need the measures proposed in the rule change.

At present, it appears that when a participant wants to rebid for strategic reasons, they are able to pick any conveniently timed event and give that as a reason.[7] This clearly defeats the purpose of requiring a verifiable reason.

To address this through regulation, late rebids would have to be:

- A timely response to a material and verifiable change in circumstances.
- A logical, justifiable, and proportionate response to that change in circumstances.

These requirements are difficult to codify. The proposed rule addresses the first adequately, but not the second.

Q5 Do you consider it reasonable that all bids and rebids should be made with reference to published AEMO data?

No. Generators should be able to form their own views based on all available data. It is also important that they are able to respond to physical events in their plant.

Q6 What are your views on any of the options discussed above? Do you consider any of these options or any other options around the design of the bidding process to better address the issues raised in the rule change request? Are there any approaches used in electricity markets in jurisdictions overseas that could provide insight into the development of options to address issues raised in the rule change request?

The NEM seems to be unique amongst electricity markets in having gate closure after the start of the trading interval. Of the comparable energy-only markets, Alberta, Ontario, and New Zealand have gate closure 2 hours ahead of the start of the trading interval, in Singapore it is 65 minutes ahead, and in Texas it is 1 hour ahead.

We are not aware of complaints of inefficient dispatch in these other markets due to limitations on rebidding. Generally, other markets allow post-gate-closure rebids when there is a bona fide physical reason why the plant in question cannot meet its previous commitment. Such late rebids are expected to be rare, and are

[7] See, for example the discussion about rebidding on 21 February 2014 in footnote 4.

routinely investigated if they appear to lead to financial advantage for the participant concerned.

Gate closure is important because it gives an opportunity for customers, who are price takers, to respond to price signals. If customers do not have actionable price signals, then demand-side participation is suppressed.[8] Customers have no incentive for economic withholding, so it is not unreasonable to give them the last bite of the cherry.

While the ACCC may have thought in 1997 – when competitive wholesale electricity markets were a novelty – that the benefits of allowing unfettered rebidding within the trading interval outweighed the costs, it is likely that a different conclusion would now be reached in the light of experience in the NEM and in other markets.

We recommend the introduction of gate closure ahead of the beginning of the trading interval, with provision for bona fide changes due to physical plant issues.

We would also support:

- The alignment of settlement and dispatch intervals, as discussed in our response to Question 2. This would be in line with the practice in Singapore and many other markets, and would remove the potential for non-causal price changes.
- The introduction of two-stage settlement – a forward market and a balancing market – as in Texas and many other markets. This would separate the two key functions of the market: discovering an efficient price for the forecast balance of supply and demand so that the correct units are committed (for which unrestricted rebidding is essential, and timing is not), and responding to unforeseen events at short notice (where unit commitment cannot readily be changed, and response time is crucial).

7 Suggestion for improved auction design

The presentation by Jeff Borland at the AEMC stakeholder forum in Melbourne on 5 May 2014 made an important distinction between the design of the NEM and that of many auctions.

In well-designed auctions, each new bid typically leads to an automatic extension of the auction, so as to allow other bidders to respond. It is the inability of bidders to respond due to the hard time limit in the NEM that leads to the potential for late strategic rebids.

[8] The issue of actionable price signals is also being considered in the New Zealand market. The Electricity Authority's Wholesale Advisory Group has recognised that reducing uncertainty around spot prices could have significant benefits – see e.g. Wholesale Advisory Group, *Aligning forecast and final prices*, Discussion Paper, June 2013, pp.20-25. The principal cause of price uncertainty in the New Zealand market differs from that in the NEM, but the effects are similar.

This suggests the potential for an enhancement of the two-stage settlement design that would introduce a similar property: gate closure on the forward market could be slightly extended whenever a new bid is received that changes the forecast price. This would allow other parties to respond to the effect of the new bid. To avoid a loophole, once the normal gate closure time has passed, consecutive bids from the same party would have to be disallowed. Some care would be needed in the design of the rules to ensure that the gate would finally close before the beginning of the relevant trading interval.

We believe this idea may merit further examination.

I would be happy to provide further detail on these comments, if that would be helpful.

Yours sincerely,

Dr Paul Troughton
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