Mr Ben Noone
Australian Energy Market Commission
Level 6, 201 Elizabeth Street
Sydney NSW 2000

Lodged via www.aemc.gov.au

Monday, 20 June 2016

Dear Mr Noone,

RE: Five Minute Settlement (Ref: ERC0201)

ENGIE appreciates the opportunity to comment on the Australian Energy Market Commission (AEMC) consultation paper regarding five minute settlement of the wholesale electricity market.

ENGIE is a global energy operator in the businesses of electricity, natural gas and energy services. ENGIE is the number one independent power producer in the world with 115.3 GW of installed power-production capacity, 19 GW of which is renewable. ENGIE employs 1,800 people in Australia and supplies 12 per cent of Australia's National Electricity Market, and has an installed generating capacity of more than 3,550 MW. ENGIE also owns Simply Energy which provides electricity and gas to more than 550,000 retail customer accounts across Victoria, South Australia, New South Wales and Queensland.

Sun Metals Pty Ltd have proposed changes to the National Electricity Rules (NER) to reduce the time interval for settlement in the National Electricity Market (NEM) from 30 minutes to five minutes, whilst leaving the dispatch interval at the current value of five minutes.

Sun Metals is of the view that the mismatch between the dispatch and settlement intervals leads to inefficiencies in the market, provides incentives for generators to withdraw capacity to influence price outcomes and impedes some categories of participants from entering the market.

The proposed solution is to introduce compulsory five minute settlement for generators and scheduled loads, and optional five minute settlement for other demand side participants in the NEM. To overcome the cost of requiring five minute revenue metering for all scheduled participants, Sun Metals propose that five minute settlement could be implemented using existing five minute prices calculated by AEMO and energy from existing revenue meters,

allocated to the five minute periods within a half hour using data from supervisory control and data acquisition (SCADA) systems.

Other wholesale market participants, including retailers and large consumers, could choose to be settled on either a five or 30 minute basis. All participants may choose, at their own cost, to install metering equipment capable of accurately measuring energy on a five minute basis.

The imbalance between the money earned by supply side participants settled on a five minute basis and the money paid by demand side participants settled on a 30 minute basis would be recovered entirely from those demand side participants who continue to be settled on a 30 minute basis.

The AEMC consultation paper sets out the proposed assessment framework to evaluate whether the proposed rule is likely to promote the NEO. That assessment framework includes the following factors:

- Prices that reflect the marginal cost of supply and value of its use
- Price risk exposure
- Price risk allocation
- Supply and demand side competition
- Regulatory and administrative burden

ENGIE supports the proposed assessment framework, noting that the AEMC have indicated that this may be refined during the consultation process.

In applying this assessment framework, ENGIE would encourage the AEMC to remain mindful of the practical realities that typically impact on both generator and demand side participants, and often prevent the achievement of theoretical efficiencies. For example, fast start generators that decide to start in response to a high five minute price signal in most cases will need more than five minutes before they are able to provide energy to the market. This reality has implications for both the current dispatch / settlement time frames, as well as the proposed five minute settlement.

The AEMC consultation paper has identified a number of issues for consultation, and has sought stakeholder comment on these. ENGIE has provided responses to some of the issues for consultation below.

Is there a problem?

ENGIE agrees with the observation outlined by Sun Metals in their rule change proposal that the current five minute dispatch and 30 minute settlement process means that the price effectively changes after a participant has responded to a five minute signal. This change comes about through settlement price being determined at the end of each 30 minute trading interval by calculating the simple average of the preceding six dispatch intervals.

ENGIE also agrees that ideally, if a participant makes a decision at the start of a dispatch interval in response to the current spot price, then that same price should ultimately be used for settlement of that particular interval. If there were no other constraints or considerations, this would provide the purest and most efficient form of dispatch

and pricing. However, the dynamics of the electricity industry coupled with the energy only design of the NEM impose a number of practical and financial constraints on achieving the purest outcome.

Sun Metals have highlighted that demand side participants who are exposed financially to the wholesale spot price in the NEM can see the 30 minute price increase above the level that they are willing to pay by price spikes that occur towards the end of the 30 minute period.

As well as considering the extent of the problem, it is equally important to consider how successful the proposed solution is likely to be, and whether it would introduce other issues.

If the rule change proposal were to be adopted and the settlement and dispatch cycles were both set to five minutes, only participants that were able to respond within the five minute interval would be able to appropriately manage their price and volume risks in the spot market. For example, base load generation that was already online and able to ramp reasonably quickly in response to changes in its dispatch target would in most instances, be able to achieve an efficient outcome.

ENGIE believes that particular consideration needs to be given to the category of generation in the NEM known as fast start generators. This category of generation is largely made up of gas turbine powered generators that are able to start from rest and achieve minimum operating output in a relatively short period of time. The NEM rules include a fast start inflexibility profile that requires fast start generators to specify:

T1: time to synchronise
T2: time to reach minimum operating level
T3: time required at minimum operating level
T4: time to shut down from minimum operating level

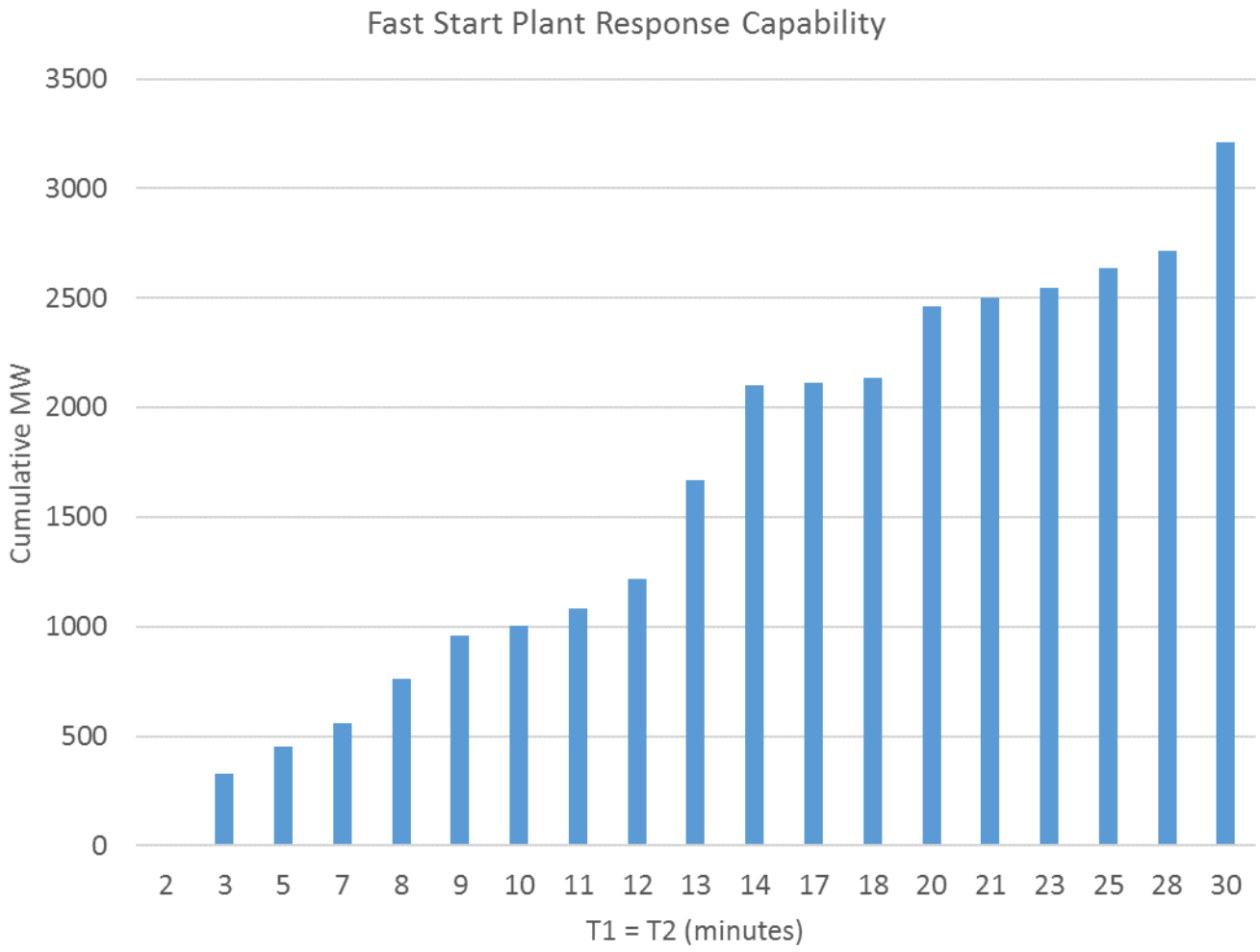
Fast start generators typically take greater than five minutes to start up and reach minimum operating level, which introduces a complexity given that the NEM dispatch process is limited to a five minute window. The fast start inflexibility profile was included in the NEM rules to provides a means of optimising fast start generator output each five minutes, whilst meeting the start up and shut down constraints of fast start generators which span across a number of five minute periods.

The time required for a fast start generator to synchronise to the power system and then increase generation to its minimum operating level is obtained by adding together the generators T1 and T2 values. For example, a fast start generator that has bid in T1 = three and T2 = six will require a total of nine minutes to start up and reach its minimum operating level.

ENGIE has examined a sample of generator bid data to identify the amount of fast start generation capable of responding within a five minute dispatch interval. The following graph, based on data extracted from NEM bid data for 15 June 2016[1], identifies only a small proportion (approximately 450 MW) of fast start generation able to reach

[1] Data extracted from bid data:
http://www.nemweb.com.au/REPORTS/CURRENT/Yesterdays_Bids_Reports/PUBLIC_YESTBID_201606150000_20160616040518.zip

minimum operating level in five minutes or less. The majority of fast start generators require more than five minutes to start up and reach minimum output, as summarised in the following diagram.



Graph showing the cumulative minimum MW available on 15 June 2016 from fast start generators in the NEM at different time frames. For example, at 5 minutes, approximately 450 MW in total could be dispatched, whereas after 20 minutes, nearly 2500 MW is available.

Given that only a small proportion of fast start generators are able to provide any substantial MW response in five minutes or less, under five minute settlement it would not be possible for most fast start generators to have any certainty of the price that they will receive when being dispatched.

For example, suppose that a fast start generator has an offer price of $300 and its T1 + T2 = ten minutes. Suppose that the 5 minute price suddenly increases to $300 in interval D1. The fast start generator will be issued an instruction to start, but the generator will not be able to generate any power in interval D1. Suppose that the five minute price in D2 falls to $50. The fast start generator has already commenced its start sequence and so will begin to generate power at the end of D2. If the five minute price for the subsequent periods D3 and beyond remains below $300, the fast start generator will be operating below its offer price and therefore likely to be running at a loss.

The current 30 minute settlement provides a smoothing effect by averaging out the six dispatch interval prices. This allows the fast start generators to have some confidence that even if a five minute price spike turns out to be fleeting, it will still influence the 30 minute price through the averaging process, providing the fast start generator with at least some confidence when it responds to a five minute price spike. This smoothing effect is also demonstrated in the example shown in figure 5.2 of the AEMC consultation paper.

Based on the above analysis, it is possible that a move to five minute settlement could provide a further disincentive for fast start generators in the NEM. Given the current uncertainty surrounding the impact of intermittent generation and the resultant price volatility, there is an increasing recognition that flexible plant, including fast start generation, needs to be maintained to fill in the gaps left by intermittent generation sources. Moving to a five minute settlement regime could diminish the incentive for fast start generators to remain in the NEM.

In summary, ENGIE agrees that the current five minute dispatch coupled with 30 minute settlement can lead to uncertainties and sub optimal outcomes for both the demand and supply sides of the NEM. ENGIE would argue however that market participants have invested to meet the current 30 minute arrangements and that the market has evolved to account for this and provides a means for fast start generators to respond to a five minute signal.

On balance, ENGIE suggests that the implications of a change to five minute settlement are somewhat difficult to predict and may impose unintended consequences.

SCADA

The proposal seeks to avoid the need to install five minute revenue metering by using SCADA measurements as a means to profile the 30 minute revenue metered data, to obtain a proxy for the five minute energy delivered or consumed.

As set out in the consultation paper, unlike revenue metering SCADA metering is not subject to any accuracy standard, and typically has an error range which is much larger than revenue metering. SCADA data is also subject to periods of failed or missing data, and there are no standardised procedures in place that would overcome this deficiency.

SCADA metering provides a suitable means to monitor and operate the power system, which relies on a degree of precision, but is somewhat resilient to small errors in SCADA metering. The very large sums of money that are transacted in the NEM require a high level of accuracy and confidence in the metering data that underpins the settlement process, and this cannot be provided by SCADA metering.

For the reasons set out above, as well as the additional issues discussed in the consultation paper, ENGIE does not support the use of SCADA measurements in the revenue settlement processes of the NEM.

Settlement residue

The proposal includes a proposition that five minute settlement be compulsory for scheduled generators, scheduled loads and scheduled network service providers, and optional for other participants. The likely implication of this is

that some demand side participants will elect to remain with 30 minute settlement, thus avoiding the cost and complication of moving to five minute metering.

The arrangement of having some customers settled on 30 minute data with the rest of the NEM settled on a five minute basis would result in a discrepancy between the money collected from customers and the money paid to generators. This would be additional to the existing intra regional settlement residue that accrues in the NEM due to marginal loss factors for both generators and loads being included in the settlement calculations.

ENGIE has an in principle objection to different sectors of the market having different standards of obligation, and believes that to the extent that is practically and efficiently possible, both supply and demand sides of the NEM should be subject to the same rules and obligations. If this principle is undermined, then the fundamental concept of a market based on willing buyers and willing sellers starts to break down.

ENGIE is also concerned with the proposed approach of allocating the metering discrepancy residue to the TNSP along with the existing intra regional residue. The existing intra regional residue arises due to the marginal loss factors for both generation and distribution being included in the settlement calculations.

In essence, the intra regional residue occurs as a result of the customers having to pay additional money to account for the network losses. This money is ultimately returned to customers by being allocated firstly to the transmission network service provider and then to the customers. Thus the calculation and subsequent allocation of intra regional residues seeks to provide appropriate drivers on networks to maintain their networks to minimise losses. Interfering with this signal by adding in an unrelated residue from a metering difference would interfere with this important network signal.

ENGIE trusts that the comments provided in this response are of assistance to the AEMC in its deliberations. Should you wish to discuss any aspects of this submission, please do not hesitate to contact me on, telephone, 03 9617 8331.

Yours sincerely,

Chris Deague
Wholesale Regulations Manager