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Five Minute Settlement
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The Australian Energy Council (the "**Energy Council**") welcomes the opportunity to make a submission in response to the Australian Energy Market Commission's ("**AEMC**") Five Minute Settlement Directions Paper.

The Energy Council is the industry body representing 21 electricity and downstream natural gas businesses operating in the competitive wholesale and retail energy markets. These businesses collectively generate the overwhelming majority of electricity in Australia and sell gas and electricity to over 10 million homes and businesses.

Introduction

The current National Electricity Market ("**NEM**") was introduced in 1998 and has had more than 150 rule changes since the AEMC was established in 2005. While many of these changes have been incremental, e.g. clarifying the definition of Business Day, there have been notable material changes, such as the abolition of the Snowy Region. None of these changes compares with the magnitude of the proposal to replace the existing five minute dispatch–thirty minute time-weighted average settlement market with a five minute dispatch–five minute settlement market. The dispatch and settlement process is the "engine" of the wholesale market. It delivers 95-99 per cent of revenue to generators, and it underpins the financial contracts for difference that stabilise the market. A fundamental change such as this needs to be considered holistically rather than as a piecemeal rule change.

For example, this change needs to be considered in the context of other rule changes being proposed. The outcome of the proposed ERC0203 "Non-scheduled generation and load in central dispatch" rule change has major implications for how this rule change is evaluated.

Benefits

The Directions Paper suggests that embracing five minute settlement will increase the efficiency of the NEM. While the Energy Council acknowledges that this is theoretically true, this will have an effect on the current generation mix which is projected to increase by approximately 4,000MW over the next five years, 1,500MWh of which is battery storage[1]. Removal of the averaging of dispatch interval prices over a thirty minute trading interval will have a marked effect on market participants' risk profiles and risk management processes. It is by no means certain from the stylised examples and simple analysis of the spot market only (rather than both the spot and contract markets) presented in Chapter 3 of the Directions Paper that there will be a significant benefit to the market by moving to five minute settlement, and it is important to conduct quantitative analysis to be more confident of the expected benefits.

Costs

Chapter 7 of the Directions Paper discusses the categories of one-off and ongoing costs associated with moving to five minute settlement, but does not seek to quantify the costs in any way. Instead the AEMC suggests that these costs can be mitigated by the use of a transition period. While the Energy Council agrees

[1] Jacobs, *Projections of uptake of small-scale systems*, Report for AEMO, 6th June 2016

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that having a transition period may assist in replacing short-term electricity contracts as they expire, long-term contracts, such as power purchase agreements, will receive no benefit from a transition period, nor will the one-off costs reduce appreciably. In fact the proposed three year transition period may be manifestly inadequate for the anticipated unbudgeted IT system changes, since many market participants may be reliant on the same IT expertise and external service providers to conduct the necessary changes – a resource which may not available due to the concurrent demands. In addition, the multiple systems affected, which include metering systems, bidding systems, trading system, risk management systems and settlement systems, are deeply interrelated, and changes will be complex and carry a high risk of failure.

Cost-Benefits and the National Electricity Objective

On this basis, and work conducted by Russ Skelton & Associates on behalf of the Energy Council[2] (attached), the Energy Council finds that a positive cost-benefit result is not proven, and recommends that the AEMC conducts a rigorous cost-benefit analysis before proceeding to the next step of issuing a draft determination, to ensure that costs to consumers do not increase either during the proposed transition period or after implementation. By performing a cost-benefit analysis, the Energy Council believes that the National Electricity Objective test of "efficient investment … for the long term interests of consumers of electricity" will be properly tested.

System Security

While the concern about efficient investment is significant, the Energy Council has serious reservations about the effect the proposed change will have on system security during the transition period and beyond.

Both existing fast-start plant and the newest generation of fast-start gas turbines have physical limitations in the speed at which they can respond to dispatch instructions, and use the thirty minute settlement period to derive a return. Should the settlement period be shortened, it is expected that price volatility will increase, and fast-start plant will be unwilling to respond, since it would be unlikely to derive a reasonable return for its minimum run time. Its ability to generate a return will therefore be compromised and ultimately its longevity shortened, as companies mothball or retire plants not producing sufficient return and reconsider investment decisions in any future plant. Ignoring the fairness of changing the market basis under which such plants were planned, financed & built, this could be a tolerable outcome if alternative technologies were available to meet the market demand, but this is far from clear.

Thus, in the absence of alternative payment mechanisms such as a capacity payment, existing fast-start plant will be squeezed out of the market and variations in demand will be addressed by either new technologies (to the extent they are able to do so) or other existing technologies such as coal, which, while running as baseload, have some ability to increase, provided additional capacity remains available, or decrease supply at short notice. Accordingly, it is not appropriate to assume that five minute settlement will have a positive overall impact on emissions from the power sector.

Other unexpected outcomes may also occur. For example, very responsive technologies such as batteries may generate for only a portion of a dispatch interval, thereby sustaining high prices and increasing their returns, but at the cost of system security and stability. Also, this very fast response from these technologies in response to price outcomes may result in a requirement to enable additional FCAS contingency services to manage frequency stability.

In addition, unless the proposed new technologies are of sufficient size to warrant registration and scheduling in the NEM, then AEMO, which relies on accurate supply and demand information to run the NEM and ensure the security of supply, will be blind to a large part of the market. This will be exacerbated by increases in the amount of generation and storage installed behind the meter, with no oversight of its supply & demand profile or intentions. Should the AEMC proceed with the rule change, a complementary reform must be made to ensure the behaviour of technologies and services that are potentially reacting to market price changes is visible to the rest of the market.

[2] Russ Skelton & Associates, *5-Minute Settlement: Assessing the Impacts*, Report prepared for the Australian Energy Council, March 2017

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Adverse Contract Market Impacts
We commend the AEMC for commissioning the analysis from EnergyEdge on potential impacts in the contract market. Energy Edge calculates conservatively that there is likely to be a 625MW reduction in the availability of cap ($300/MWh strike) products. The quantum calculated is based on ASX-listed products and therefore there is acknowledgement that additional volumes of cap contracts would be reduced from contracts negotiated bilaterally. This reduction in the availability of cap contracts would have a detrimental impact on market participants' ability to manage risk and would be especially felt by second tier retailers. As a consequence the Energy Council expects competition in the retail sector would decline, as second tier retailers would be at a significant disadvantage to large retailers who have alternative means to manage their risk. Anticipated battery energy storage is unlikely to fill the void left from peaking generators' inability to sell the same level of caps. According to Dr Finkel[3] it could take more than 20 years before grid scale batteries are price competitive.

Regulatory Risk
The whole issue of system security is further exacerbated by the regulatory risk introduced by changing the NEM's operating basis in such a fundamental way. Since the rule changes will have a retrospective adverse effect on existing plant, it is likely that this risk will be recognised when funding is sought for new technologies. Battery supply companies have reported that they are successful in securing funding and developing their product in the existing market, therefore there seems to be little justification for changing the market rules in an attempt to foster technologies which can address a perceived, but not proven, market need.

International Comparisons
In the Directions Paper, the AEMC pointed to the US Federal Energy Regulatory Commission's ("**FERC**") decision that requires the FERC regulated energy markets (approximately 2/3 of the US electricity load) to align dispatch and settlement. It is important to note that the FERC decision does not stipulate that these markets implement 5 minute dispatch and settlement, only that these be aligned to the same time period. As some US markets currently use five-minute dispatch, with either 30 and 60 minute settlement, this appears to be presumed to be advocating for five-minute dispatch and settlement. It is equally possible that dispatch and settlement could be aligned on different timeframes, such as 15 minutes or even 30 minutes.

In addition, in the US (with the exception of Texas), the UK and parts of Canada, energy markets have capacity markets attached also. These markets, with their differing time periods, differing market price caps and attached capacity markets, operate on a fundamentally different basis to the NEM, therefore the Energy Council is concerned that the overseas experience will be used as one of the justifications for the five minute settlement change proposed here in Australia, when this is not an appropriate conclusion.

Monitoring Regime
This rule change proposal has shown that:

- stakeholders have differing views about the importance of the materiality of the misalignment between dispatch and settlement;
- the costs associated with modifying systems and processes to accommodate five minute settlement are significant;
- the adverse consequences to the liquidity of financial derivative products are significant, and likely to have a sustained negative impact on the level of competition in the NEM; and
- alternative products to replace cap contracts from synchronous generators are unlikely to provide a direct substitution for existing products for a very long time, perhaps in excess of 20 years.

For these reasons the Energy Council considers that, at some stage in the future, aligning dispatch with settlement may be an appropriate solution to ensure pricing signals provide incentives for efficient market behaviour, however the current and expected generation mix in the NEM if the rule change were to be ratified is not expected to deliver benefits that would exceed the costs of implementation. The risks associated with moving to an alignment of the dispatch and settlement cycle are skewed to the downside, with high levels of spot market volatility and a reduction in the availability of hedging products.

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[3] Potter, B., "Future grid has batteries, renewables and software – Finkel", *Australian Financial Review*, 8th February 2017, http://www.afr.com/news/future-grid-has-batteries-renewables-and-software--finkel-20170208-gu8j12, accessed 13th May 2017.

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The Energy Council therefore believes a monitoring regime in anticipation of suitable conditions for the rule change is more appropriate than ratifying the rule at this time. The monitoring regime would, on a biannual basis, report on the market, technological & investment environments to determine if conditions are right for aligning the dispatch and settlement cycles. A review would then be initiated to determine the best means of implementing the alignment of dispatch and settlement cycles, with disruption minimised.

Next Steps

If the AEMC is minded to go ahead with a version of the rule change, then to ensure the maximum nett benefits to consumers, the AEMC must do the following:

1. The case for the rule change is predicated on the value of aligning dispatch and settlement (noting that there has been no real quantitative assessment of the nett benefits of doing so). If this is the primary objective, and given the upheaval and costs 5 minute settlement will impose, then it is worth considering what time frame for dispatch/settlement minimises the costs and risks. A 15 minute period would better align with the performance of OCGTs and other existing flexible technologies and thus reduce the risks of their withdrawal from the market. More balancing services would be required for a longer dispatch period, but this would present additional revenue opportunity for batteries.

2. To minimise the risks, especially those to the caps market, the rule change should only proceed when participants are confident that the market is well prepared to adapt. The AEMC should set out the criteria for enacting the rule change. These should include:

    - sufficient fast-start scheduled supply (or equivalently firm and flexible demand response) to mitigate for the risks of OCGT withdrawal;
    - sufficient contract market liquidity;
    - signs that metering competition is delivering greater numbers of type 5 meters; and
    - adequate IT system readiness and budget for implementing the necessary changes.

3. Examination of the complementary reforms that would support market efficiency, in particular the scheduling rule changes mentioned above.

Conclusion

In conclusion, the Energy Council believes that while it is important to align the dispatch & settlement cycles, the case for undertaking such a change in the current market has not been proven. To do so the Energy Council recommends a rigorous cost-benefit analysis be conducted, taking into account the system security implications of disadvantaging existing technologies and the costs to consumers during the transition period and after implementation. In addition, the Energy Council recommends establishing a monitoring regime to determine when market, technological & investment conditions are right to implement the proposed rule change.

Any questions about this submission should be addressed to the writer, by e-mail to kieran.donoghue@energycouncil.com.au or by telephone on (03) 9205 3116.

Yours sincerely,

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