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Australian Energy Market Commission
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Submitted by email to aemc@aemc.gov.au

National Electricity Amendment (Five Minute Settlement) Rule 2017 – Draft Rule Determination

Snowy Hydro Limited welcomes the opportunity to comment on matters raised in the Draft Rule Determination from the Australian Energy Market Commission (the Commission) on the National Electricity Amendment (Five Minute Settlement) Rule 2017.

Snowy Hydro Limited is a producer, supplier, trader and retailer of energy in the National Electricity Market ('NEM') and a leading provider of risk management financial hedge contracts.

Executive Summary

Snowy Hydro continues to have very serious concerns with the Commission's draft rule recommendation to alter the basis of the National Electricity Market ("NEM") from thirty minute settlement to five minute settlement. As previously articulated in our submissions, we continue to hold reservations that the proposed rule change satisfies the National Electricity Objective when there has not been a cost benefit analysis undertaken. We believe there would be severe and adverse consequences to the NEM with higher energy and ancillary service costs, higher Spot market volatility that would jeopardise system security and reliability, and the change would not facilitate a transition to a low emissions environment. We strongly believe the rule change will create structural risks that will threaten the sustainability of NEM and increase the risk of further intervention in the market.

Monitoring regime

We strongly recommend the AEMC reconsider a monitoring regime (similar to the Optional Firm Access review (OFA)). The advantage of this is as more information comes to hand (ie. the availability and penetration of large scale batteries takes off) aligning dispatch and settlement could be implemented in the future with more certainty that it would deliver net benefits and be done with a shorter transition period.

Longer transition is required

The AEMC has offered up to 3 years and 7 months as the transition period for implementing 5 minute settlement. Snowy Hydro has suggested 8 years transition. This was derived from the average of 3 years (liquid OTC period) and 13 years (Power Purchase Agreement for Renewable Energy target end of 2030) ie. $(3+13)/2$.

A longer transition period is recognition that the benefits of the 5 minute settlement are ambiguous when weighed up against the costs which are tangible and real.

If the AEMC remains committed to its Draft Determination to ratify the Rule, Snowy Hydro is concerned that the proposed three year and seven month transition period is the shortest time “possible to enable market participants and AEMO to manage the significant implementation issues¹”.

There is significant ambiguity in how the metering aspects will work in practice. Many of the practical metering risks that has manifested in the Power of Choice process are also applicable in the 5 minute settlement implementation process. Hence the implementation date of 1 July 2021 is predicated on AEMO locking down all of the necessary procedures in the Power of Choice process by 1 Dec 2020. Therefore the 3 year 7 month transition effectively becomes a 6 months transition with no leeway to manage any unexpected difficulties.

As a minimum Snowy Hydro advocates for a 1 July 2022 implementation date which would allow Market Participants and AEMO an additional 12 months to implement this major change to the NEM.

¹ AEMC, Five Minute Settlement) Rule 2017, Draft Determination, page vi.



Impact on Cap Contracts

The capacity factors of generation plant can be used a proxy of when generators are on-line. A capacity factor of 100% means the generator was on-line all the time. A capacity factor of 50% means for a calendar year the generator was on for 4380 hours (calendar year has notionally 8760 hours). Table 1 shows the capacity factors of Snowy Hydro's peaking generators.

Station	Capacity Factor (%)
Angaston	1
Colongra	0.2
Laverton North	6.7
Lonsdale	1.2
Stanvac	1.2
Valley Power	0.2
Guthega	12.5
Murray	14.5
Tumut 3	2.9
Upper Tumut	19

Table 1: Capacity factors of Snowy Hydro generation plant, 2017 year to 4 October.

The capacity factors for Snowy Hydro's peaking gas and diesel generators are very low and generally below 7% for all stations. The capacity factors for Snowy Hydro's hydro generation vary from 3 to 19%.

Three independent consultant reports have derived very different impact on the Cap contracts under 5 minute settlement as shown in the table 2 below.

Consultant	Commissioned By	Cap Contract Reduction (MW)
Energy Edge	AEMC	625
Marsden Jacob	Snowy Hydro	4200
Seed Consulting	AEC	2500
Average:		2441

Table 2: Consultant reports showing the impact of 5 minute settlement on Cap contracts.

From the following factors:

- Historical capacity factor data showing peaking generators are not on-line all the time (Table 1) and
- The available analysis to date has shown that price spikes are difficult to predict.

Snowy Hydro asserts the impact on Cap contracts from 5 minute settlement would be skewed more towards the greater impact figures concluded in Table 2 from the Marsden Jacob and Seed Consulting reports. The impact on the availability of Cap contracts would be in the vicinity of 2500 to 4200 MW. A reduction in this volume of Cap contracts would have a detrimental impact on both wholesale and retail market competition.

Implementation

Snowy Hydro believes the Commission need to work through certain issues if they are to proceed with the rule change. The Commission needs to understand the risks for consumers in terms of cost, reliability and system security and that reforms for scheduling the dispatch of aggregated battery storage are in place before implementing the rule change within a suitable transition period of 5 years. A 5 year transition period will provide time for these issues to be further addressed and resolved.

Snowy Hydro is concerned about the proposed three year and seven month transition period following the Commission's note that the rule change will lead to *"changes to risk management policies and physical infrastructure and may require multiple years to implement."* If the implementation period cannot be extended to 5 years, which would minimise the risk of a proper assessment, then the Commission should not consider any shorter period as the AEMC has stated that a transition period of three years and seven months is the shortest time *"possible to enable market participants and AEMO to manage the significant implementation issues"*²

Implementation costs

Snowy Hydro supports the Commission acknowledgement that there *"will be large costs incurred in relation to the changes required to financial contracts, metering and IT systems to implement five minute settlement"*³. However we are extremely concerned that the Commission believe the estimated costs are small when compared to the annual NEM transactions and investment costs required in the NEM. The Draft Determination proceeds to note that the \$250 million estimate of implementation costs by Russ Skelton & Associates if taken at face value does not equate to the increase on *"business as usual"* of making the rule. According to the Commission *"some expenditure will happen irrespective of the rule change because systems are routinely updated and replaced"*⁴.

The Commission has failed to appropriately consider the costs of the rule change while continuing to assess the benefits of 5 minute settlement premised on theoretical benefits from an alignment of dispatch and settlement periods. Marsden Jacob Associates (Marsden Jacob) concluded in their report for Snowy Hydro that the likely impacts of 5 minute settlement in various electricity markets (e.g. spot, ancillary services and the market for caps) (see Table 3), as well as the level of liquidity in the Caps market will have significant cost and revenue impacts. The Commission has failed to consider the operational processes of participants in the forward contract market.

² AEMC, Five Minute Settlement) Rule 2017, Draft Determination, pp17

³ Ibid, pp16

⁴ Ibid, pp123



Component	Change
Implementation Costs (e.g. IT systems, re-contracting etc.)	Increase of \$250 M
Caps Offered	Reduction of at least 4,000 MW
Cap Premiums	Increase of at least \$130 M per annum
Out of Merit Dispatch Costs	Increase of \$60 M per annum
Frequency Control Ancillary Service Costs	Increase of \$15M to \$30M per annum

Table 3: Estimates of the Impact of 5 minute settlement⁵

A conservative net present value analysis of the costs imposed by 5 minute settlement would yield total costs in excess of \$1.5 billion dollars.

The Commission has not properly assessed the impact of the rule change through an economic (cost-benefit analysis). Rather the Commission has compared the costs to the ongoing NEM transactions and the expected medium term generation investment that is required in the NEM over the medium term and noted that the operation an investment changes will be minimal. Snowy Hydro does not believe that the Commission has properly assessed the costs and benefits.

Cold Start strategy

The Draft Determination dismisses the “cold start” strategy suggested by Snowy Hydro and Marsden Jacobs. The Commission rejects the strategy assumption that price spikes are unexpected.

This is contradictory to the Commission’s research in the same paper which took five and a half years' worth of data from for the NEM states and analysed the conditions present when the dispatch price was above \$1,000/MWh. According to the Draft Determination price spikes in South Australia appear *“to be more unpredictable using these metrics, which may be due to the relatively high penetration of wind and solar generation, as well as interconnector limits and outages.”*⁶ The Draft Determination then acknowledges that *“regional factors have contributed to historical price outcomes”* and *“also sees the potential for the conditions to South Australia (e.g. high penetrations of wind and solar generators, retirements of thermal generators) to be replicated in other regions to varying degrees.”*⁷ This highlights that prices are likely to be unexpected especially in South Australia which

⁵ Marsden Jacob Associates, 2017, “Impact of 5-Minute Energy Settlement”, Report prepared by Snowy Hydro

⁶ *ibid*, pp60

⁷ *ibid*, pp34

could flow on to numerous other NEM states as each state transitions to more renewables and intermittent generation.

The historical research undertaken by Energy Edge (commissioned by the AEMC) showed that in the period January 2015 to March 2017 single dispatch interval price above \$300 or \$1,000 were uncommon. Following the end of March 2017 the Hazelwood Power station closed following a series of baseload power station closures over time. With less firm capacity available from March it remains uncertain whether the market price cap events will increase. Given this information, Snowy Hydro believes that price spikes are likely to be unexpected.

The Draft Determination proceeds to address further shortcomings of the 'cold start' assumption. The Energy Edge report notes that *“peaking generators are often already operating at a high level of output at the start of these intervals and are unlikely to be offline.”*⁸ This statement is clearly false for peaking and energy limited hydro generators as shown by the capacity factors of Snowy Hydro’s generation plant in Table 4.

Station	Capacity Factor (%)
Angaston	1
Colongra	0.2
Laverton North	6.7
Lonsdale	1.2
Stanvac	1.2
Valley Power	0.2
Guthega	12.5
Murray	14.5
Tumut 3	2.9
Upper Tumut	19

Table 4: Capacity factors of Snowy Hydro generation plant, 2017 year to 4 October.

The AEMC analysis does not consider the likely behaviour of peaking generators in seeking to turn off once peaks have passed and prices have subdued, in the interests of conserving fuel and maintaining investor returns. Snowy Hydro therefore supports the claim that peaking generators will withdraw offering Cap contracts from the market. The reduction in Cap contracts available in the market post 5 minute settlement is likely to be in the vicinity of 2500 to 4200 MW. A reduction in this volume of Cap contracts would have a detrimental impact on both wholesale and retail market competition.

⁸ Australian Energy Market Commission, “Five Minute Settlement”, Draft Determination, 5 September 2017, Sydney, pp63

Reduce power system security

Snowy Hydro continues to support the view that a change to five-minute settlement would make it more difficult for peaking gas turbine generators to defend a Cap contract. This could impact competition in the retail market and ultimately to higher prices for consumers. We support the Commission's acknowledgement that there are *“potentially risks to the contract market associated with moving to five minute settlement”*⁹ although they do not go far enough in understanding the impact of the rule change will have on the market.

According to the Commission it *“needs to be recognised that a degree of uncertainty is an inevitable consequence of participating in a competitive market such as the NEM wholesale energy market”*¹⁰. Under the current circumstance across the NEM, with the significant focus on ensuring the ongoing security and reliability of electricity supplies at low cost to consumers, it is not a valid argument by the Commission.

The increased risk for peaking generators offering Cap contracts may inevitably need to inadequate commercial and predictable returns for operating in the NEM. This rule change may lead to premature exit from the market of synchronous peaking generators. Introducing a market change that could cause such a dramatic deterioration in the security and reliability of the power system is not appropriate.

Fifteen minute settlement

In previous submissions Snowy Hydro articulated that the alignment of 15 minute settlement is likely to be more preferable to five minute settlement as it would have less adverse consequences due to the physical characteristics of the existing generation mix. In response the Commission has poorly assessed the 15 minute settlement proposal noting that the option would be an indirect form of risk management.

The alignment of dispatch and settlement cycle has continued to be limited to 5 minute settlement dispatch and the Commission has not provided serious consideration to the net benefits that should be given to 15 minute dispatch and 15 minute settlement.

The Draft Determination notes that the *“alignment at 15 minutes would also include more substantial changes to IT systems as it would require wholesale change to settlement, dispatch and the ancillary service markets”*¹¹. Snowy Hydro however supports that it would have less adverse consequences due to the physical characteristics of the existing generation mix and is unclear how the Commission has assumed that there will be more substantial changes to IT systems when a proper analysis has not been undertaken.

⁹ *ibid*, ppiii

¹⁰ Australian Energy Market Commission, “Five Minute Settlement”, Draft Determination, 5 September 2017, Sydney, pp79

¹¹ Australian Energy Market Commission, “Five Minute Settlement”, Draft Determination, 5 September 2017, Sydney, pp144

Effect of batteries on system security

In our earlier submission we provided an example involving a 1,000 MW battery gaming the dispatch process. The example refers to charging in the last minute of a 5 minute period where the battery inflates the demand used to calculate the spot price, benefiting the battery provider and having cost implications for FCAS services and severe consequences for the reliability and system security of the power system.

The Commission acknowledges the challenges that need to be resolved to fully and effectively integrate fast response energy storage noting AEMO's generation exemption guideline together with processes to increase visibility of small scale batteries. Snowy Hydro is supportive of the Commission's response although is concerned that there has clearly been an absence of a considered analysis to understand the material impact of batteries. A proper examination of the complementary reforms that would support market efficiency, in particular scheduled rule changes, which would effectively integrate fast response energy storage into the NEM has not been properly undertaken.

Larger or aggregated battery storage providers will continue to operate in a non-scheduled basis, coming in and out of the Spot market without informing scheduled generators of their intent to either discharge or charge. If this behaviour is not managed we believe it will create increased costs, volatility and risks for all Market Participants and consumers. The adverse higher cost implications for Frequency Control Ancillary Services may have severe consequences for the reliability and security of the power system.

The Commission proceeds to suggest that *"battery projects such as the South Australian Government-Tesla project promise to reduce issues related to system security"*¹². Snowy Hydro believes care must be taken in assuming the battery project will reduce system security issue in South Australia considering it is a relatively small part of relatively small market like South Australia. One hundred megawatts (MW) can perform a useful role to manage system security under some specific conditions of low time duration (ie. up to an hours duration) although analysis has been necessarily brief and indicates that the proposed battery for South Australia has limitations in both its output and its capacity.

¹² Australian Energy Market Commission, "Five Minute Settlement", Draft Determination, 5 September 2017, Sydney, pp79



Conclusion

Snowy Hydro continues to believe there are likely to be severe and adverse consequences to the NEM with higher energy and ancillary service costs. With the rule change likely to create structural risks in the NEM we believe a monitoring regime would be more prudent. In the absence of a monitoring regime a significantly longer transition period than three years and seven months is required.

Snowy Hydro appreciates the opportunity to respond to the Draft Determination. Any questions about this submission should be addressed to Panos Priftakis, Regulation Manager, by e-mail to panos.priftakis@snowyhydro.com.au.

Yours sincerely

A handwritten signature in black ink, appearing to read 'K Ly', with a horizontal line underneath.

Kevin Ly
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