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Australian Energy Market Commission
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Reliability Frameworks Review

Snowy Hydro Limited welcomes the opportunity to comment on matters raised in the Interim Report from the Australian Energy Market Commission (the Commission) on the Reliability Frameworks Review.

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.

Snowy Hydro understands that the National Electricity Market (NEM) is undergoing fundamental changes and welcomes the Commission's review into the market and regulatory frameworks necessary to support the reliability of the electricity system. We believe that the development of the reliability frameworks for the NEM should be done in a considered and evidence based manner which complements the transformation of the energy sector through a credible and enduring national energy and climate policy. Our views on the Commission's reliability frameworks review are as follows:

- For an electricity system to work properly and contribute to reliability there needs to be sufficient dispatchable and flexible capacity. Snowy 2.0 is expected to help provide flexible and dispatchable resources.

- Central to the Reliability Obligation in the National Energy Guarantee (NEG) is the definition of "dispatchable". This definition must be based on the quality of the source to contribute to the reliability and security of the power system. Dispatchable should mean that the source is able to be centrally dispatched in the Spot market, its intentions are known to the Market Operator and Market Participants, it has the same obligations as scheduled generators in the NEM to follow dispatch, and it must act in good faith as per the relevant provisions in the National Electricity Rules. The source must also have a high level of reliability such that it can be relied on to start-up and supply energy when it is required.

- There are likely to be increased errors in forecasting. The Commission has provided little detail regarding how the Australian Energy Market Operator (AEMO) could make non-scheduled participants to participate in the central dispatch process.

- The Australian Financial Markets Association (AFMA) survey of Over The Counter (OTC) electricity derivative turnover will allow greater visibility of the electricity trading hedging products and backfill any other missing data.

- The current Reliability and Emergency Reserve Trader (RERT) activation procedures remain unclear which this has led to an increased number of interventions and a potential for even more under a revised LOR.

- There does not need to be a strategic reserve that is separate to the RERT. The existing RERT can benefit from improvements to reduce complexity and costs while the likely inclusion of a reliability obligation would negate the need for a separate strategic reserve.

- There are no limitations to indicate a regulatory barrier to wholesale demand response.

- AEMO's current review in its intervention pricing methodology is important as the use of interventions in the NEM must only be used as a last resort.

- There are not sufficient issues with the current market design in the NEM such that the introduction of a day-ahead market is required. Many of the benefits of a day-ahead market are already addressed by the forward contract market that supports the NEM's real-time market.

Dispatchability and flexibility

Snowy Hydro agrees with the Commission that "*for an electricity system to work properly and contribute to reliability*"[1] it needs to involve "*efficient investment, retirement and operational decisions by market participants resulting in an adequate supply of generation capacity, including sufficient dispatchable capacity to maintain a balance of supply and demand*"[2].

The Energy Security Board's (ESB) work on the National Energy Guarantee[3] has highlighted that there needs to be a necessary level of flexible and dispatchable resources across the NEM. With the energy industry's investment focus shifting to a combination of firm lower emissions gas generation, renewables and enabling technologies, more than 3,000 megawatts of firm generation exited the market in Australia over the last few years. The inclusion of dispatchable generation however such as the Snowy Hydro pumped hydro expansion (Snowy 2.0), which was included in the NEG modelling scenarios, is expected to help provide the flexible and dispatchable resources required.

[1] AEMC 2017, Reliability Frameworks Review, Interim Report, 19 December 2017, Sydney, pp80.
[2] AEMC 2017, Reliability Frameworks Review, Interim Report, 19 December 2017, Sydney, pp41.
[3] Energy Security Board, 2017, "Advice – The National Energy Guarantee", 20 November 2017.

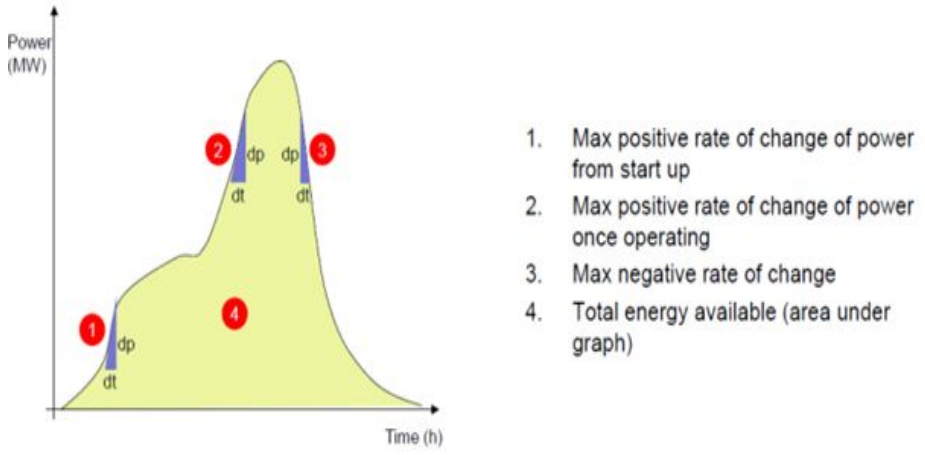
Snowy 2.0 would help the NEM transition to meeting Australia's commitment to reduce emissions by 26 per cent to 28 percent of 2005 levels by 2030 and maintain reliability. The 2,000MW of additional, dispatchable, and flexible hydro generation would play a key enabling role to support the increase in penetration of intermittent generation such as wind, rooftop PVs, and large-scale solar. This additional hydro generation could provide ancillary services such as inertia and spinning reserve which are not available from asynchronous generation from wind and solar.

In understanding the definitions of dispatchability and flexibility, Snowy Hydro agrees with the Commission that other factors should also be looked at, such as:

- Predictability of the resource;
- The capacity over time
- Location of the resource and;
- The ability of the resource to match load.

We support the Commission's view to construct an approach to understand flexibility as a subset of dispatchability. There is currently no measure to categorise whether a particular dispatchable generation source is flexible over sustained periods. The flexibility metrics could be considered for the system to understand how each source of generation could perform. The test for flexibility of dispatchable generation should not be confined to tests over a few hours rather the flexibility should also include tests over consecutive hot days.

Figure 1: Flexibility metrics[4]

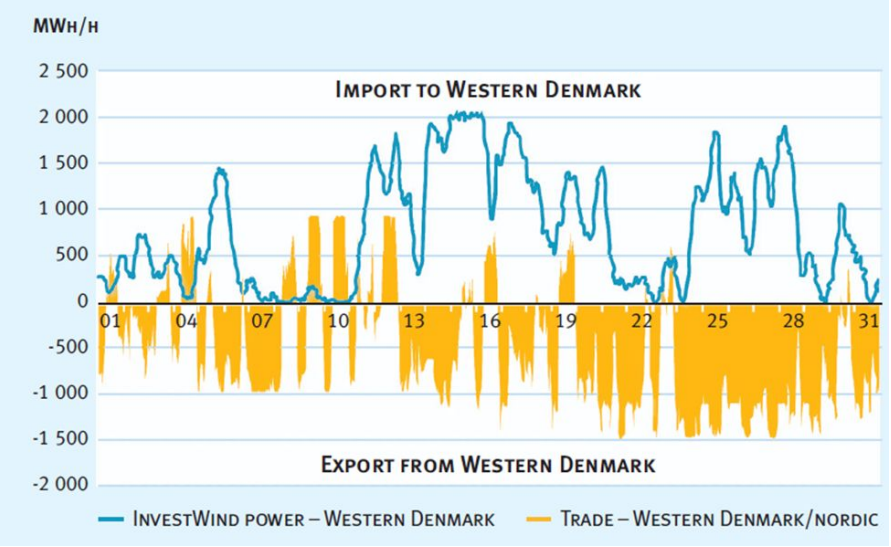


Depending on storage capacity, pumped hydro storage can provide electricity supply for 8 hours and longer while also providing ancillary services to ensure stable operation of the electricity grid.[5] The

[4] AEMC 2017, Reliability Frameworks Review, Interim Report, 19 December 2017, Sydney
[5] KPMG, 2017, "Can Pumped Hydro and Solar thermal plants provide energy security?"

Nordic market has wind and hydro-based electricity trading between Western Denmark and Norway/Sweden. The chart below shows when wind power (the blue line) was stronger, more export (the yellow bars) from Western Denmark took place and vice versa.

Figure 2: Western Denmark's electricity trading with Norway and Sweden: wind power for hydropower (2011)[6]



The rise of renewables will inevitably lead to a diversity of storage and supply solutions although until then any definition on dispatchability and flexibility will need to make sure it meets the needs of the grid and provides sustained output.

Forecasting and information processes

Snowy Hydro agrees with the Interim Report that as the electricity system continues to transform it is likely that there could be increased errors in forecasting making it harder for participants to participate in. We welcome AEMO's interim arrangements for utility scale battery technology which will likely result in generators with a battery storage facility with a nameplate rating of more than 5MW but less than 30MW applying to have their generating units classified as a scheduled generating unit.

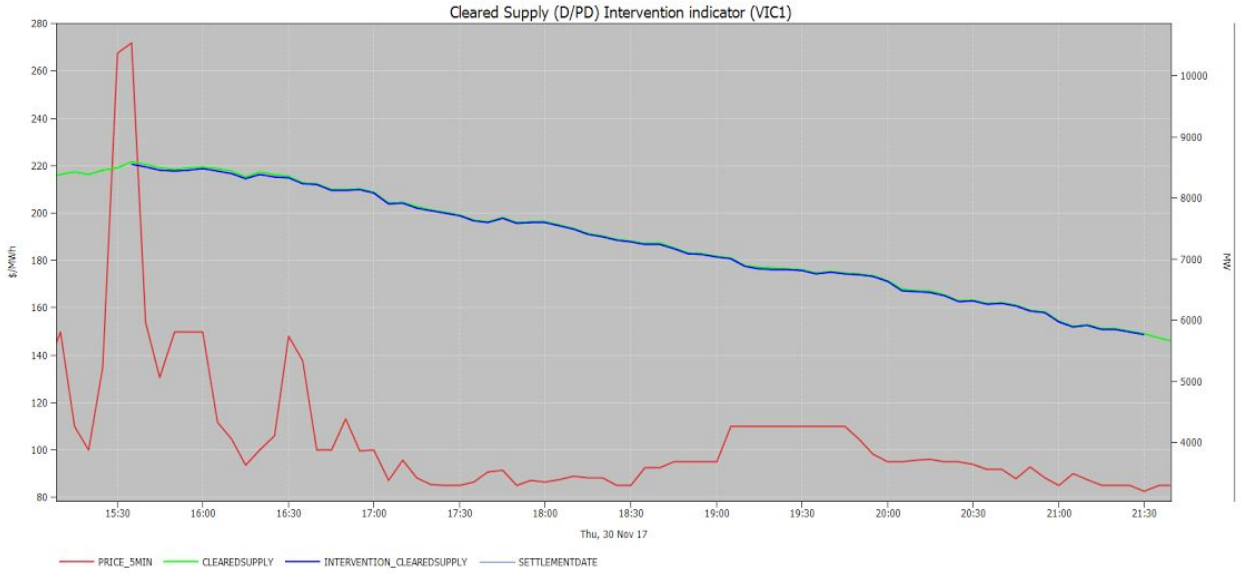
There still needs to be more transparency into AEMO's forecasting processes and methodologies. We want to understand what AEMO intends to do to improve its forecasting accuracy and how the Commission is expected to work with the market operator.

[6] Eurelectric, 2011, "Flexible Generation: Backing up Renewables"

The Commission noted that it recently considered the issue of whether or not non-scheduled generation could be scheduled, but concluded that a more preferable course of action was for AEMO to continue to maintain and improve forecast accuracy by means of its existing powers. Snowy Hydro is concerned that after the Commission's decision to not make a rule change in response to the proposed Non-scheduled Generation and Load in Central Dispatch there has been no detail regarding how AEMO could make non-scheduled participants to participate in the central dispatch process. Without a rules obligation requiring operators and agents of price sensitive non-scheduled load to inform the market of their intentions, which would improve price discovery and ensure an overall more efficient utilisation of resources for the NEM, there has been no detailed alternative provided in the Interim Paper.

The need for better forecasting was displayed last year when the Reliability and Emergency Reserve Trader (RERT) was activated on the 30th of November 2017. On this day the RERT remained in place until 21:30 despite demand having dropped by close to 2,800 MW from the time the RERT was initiated. Figure 3 below shows graph of cleared supply and price indicating the demand levels the RERT was in place for on the 30th Nov 2017.

Figure 3: Price Dispatch 5min (Intervention) – 30th of November



Dispatchable plant is being replaced by the RERT which is impacting dispatchable plant by not earning a return on its investment. If this continues it is expected to decrease investment in new or existing plant.

The introduction of five minute settlement will lead to an increase in the uptake of non-schedule generation and load. There will be a significant increase in spot market volatility from the inability of conventional peaking generators to sell cap contracts and the likely bidding behaviour of

non-scheduled generators and loads. The problems associated with the impact on non-schedule response is therefore likely to increase as there would be a further erosion in the efficient price discovery process.

With AEMO considering that its powers are inadequate to manage system security issues it is important that market participants are kept informed regarding the development of appropriate mechanisms to ensure AEMO has the necessary tools to operate the market.

Market-based aspect of reliability

We agree with the Commission that *"information is important for good investment and operational decisions"*[7]. Snowy Hydro therefore welcomes the expected restart of the Australian Financial Markets Association (AFMA) survey of Over The Counter (OTC) electricity derivative turnover. We believe this credible survey will allow greater visibility of the electricity trading hedging products and backfill any other missing data allowing an extra source of information for public use. This transparency is important to allow providers of risk management products to make available contracts which are efficiently priced. A lack of transparency on the intent of non-scheduled Participants will drive an additional risk premium to contracts.

We believe the contract markets will evolve and new products will form. Snowy Hydro agrees with the Commission that the "*contract market plays a key part in signalling market expectations of future prices, providing incentives for new generators to enter the market to make up any shortfall between supply and demand in the long-term*"[8]. We support the view that there is currently no evidence that the level of trading in the contract market should be cause for concern.

Prices in the spot and contract markets provide signals for adequate generation and demand-side resources to be built and dispatched, as well as information about the balance of supply and demand across different places and times.

Reliability and Emergency Reserve Trader (RERT)

The current RERT activation procedures remain unclear. The RERT is activated based on LoR2 with the activation depending on AEMO's "reasonable belief" that a LoR2 may eventuate. We are concerned that this has led to increased number of interventions and a potential for even more under revised LOR.

Market intervention will lead to more frequent imposition of intervention pricing. We understand that AEMO is attempting to improve the number of interventions although it is important to note that if intervention becomes a routine feature of the market then it would be contrary to the NEO. We support the Commission's cautious approach to the RERT and look to work closely with AEMO in helping improve it.

[7] AEMC 2017, Reliability Frameworks Review, Interim Report, 19 December 2017, Sydney, ppiii
[8] AEMC 2017, Reliability Frameworks Review, Interim Report, 19 December 2017, Sydney, pp16

Strategic Reserve

Snowy Hydro does not support the need for a strategic reserve that is separate to the RERT. The RERT could benefit from improvements to reduce the complexity and associated cost of participating in the mechanism. If there was a separate strategic reserve formed then the cost associated with such reserves would be significant. The Commission correctly notes that "*in considering the need for such a strategic reserve mechanism that is separate from the RERT, it is important to be clear about the problem*"[9] which we believe has not properly be addressed.

The likely inclusion of a reliability obligation as part of the development of the National Energy Guarantee (NEG) will likely negate the need for a seperate strategic reserve. The reliability obligation will oblige retailers to hold a minimum amount of contracts with dispatchable generators in relation to their own demand. The additional incentive and price signal for dispatchable synchronous plant would negate the need for a strategic reserve.

Intervention

Snowy Hydro welcome AEMO's current review in its intervention pricing methodology. We firmly believe that the use of interventions in the NEM must only be used as a last resort and that there is adequate compensation in a timely manner so Participants are no worse off than if the intervention had no occurred.

Wholesale Demand Response

Snowy Hydro supports the Commission's view that there are no limitations to indicate a regulatory barrier to wholesale demand response. We believe that any additional mechanisms specifically targeting market-based demand response would be unnecessary and potentially distortionary. Evidence that there are no barriers to energy was shown in the AEMC commissioned Oakley Greenwood (OGW) report which provided quantitative evidence regarding the amount of demand-response capacity that is currently available in the NEM[10].

In the OGW report several retailers were asked about the range of services they provide to end customers. Most of the companies were able provide the following services:

- Energy productivity
- Energy supply quality
- Energy efficiency, energy productivity and energy supply quality advisory services.
- Carbon management services
- Greenhouse gas emission reduction[11]

[9] AEMC 2017, Reliability Frameworks Review, Interim Report, 19 December 2017, Sydney, pp152
[10] Oakley Greenwood, 2016, "*Current Status of DR in the NEM: Interviews with Electricity Retailers and DR Specialist Service Providers"*
[11] Oakley Greenwood, 2016, "Current Status of DR in the NEM: Interviews with Electricity Retailers and DR Specialist Service Providers"

The Commission notes that "*if aggregators were to offer wholesale demand response services without becoming a retailer, there would need to be a framework for the provision of wholesale demand response separately to wholesale electricity*"[12]. Snowy Hydro agrees with the Commission's view that separating the two would necessitate significant changes to the current market design, which we believe is not required in the current environment, and "*separating the two services - energy and wholesale demand response - would in a sense be trying to disaggregate energy from energy*"[13].

The AER has recently introduced a Demand Management Incentive Scheme (DMIS) in distribution that provides strong financial incentives for DNSPs to undertake demand side projects.

The DMIS incetivises distribution businesses to find lower cost solutions to investing in network solutions. The incentive scheme achieves this by encouraging distribution businesses to undertake efficient expenditure on non-network options relating to demand management.

The DMIS includes a key feature called the cost uplift. The cost uplift gives distributors an incentive of up to 50 per cent above their efficient demand management costs. The incentive is only available for efficient demand management projects.

These changes should provide sufficient incentive for DNSPs to undertake sufficient demand side expenditure in the future.

Day-ahead markets

Snowy Hydro supports the Commission's view that they "*are not aware that there has been detailed consideration of whether there are sufficient issues with the current market design in the NEM such that the introduction of a day-ahead market, and the related reforms necessary to implement it, would be in the long-term interests of consumers*"[14]. The European and US markets have been properly assessed by the Commission with proper comparisons made to the NEM market.

The necessary reforms to implement the change in the market would require the undertaking of more market analysis, staff and IT resources. This would come at a time when the day-ahead market has already comprehensively been evaluated prior to the commencement of the NEM and the decision was not to introduce a day-ahead and rely instead on financial hedges between parties.

Day-ahead markets are present in most major markets in North America and across most European markets. A key function however across these markets is the efficient coordination of electricity transactions with neighbouring power markets which is not relevant in the NEM. Snowy Hydro is

[12] AEMC 2017, Reliability Frameworks Review, Interim Report, 19 December 2017, Sydney, pp128
[13] AEMC 2017, Reliability Frameworks Review, Interim Report, 19 December 2017, Sydney, pp128
[14] AEMC 2017, Reliability Frameworks Review, Interim Report, 19 December 2017, Sydney, pp164

concerned that the day-ahead market could also create new issues resulting in strategic capacity withholding or disorderly bidding.

Benefits of a day-ahead market are already addressed by the forward contract market that supports the NEM's real-time market. Market participants can already hedge pricing risk using financial derivatives under the current frameworks so any scheduling improvements from a day-ahead market would likely be limited. In addition Generators can structure their bids in the real-time market based on their costs, plant characteristics and contract position to ensure dispatch of their generation fleet to cover their contract positions. This provides some certainty over which plant will be running and for how long. If the expectation is that the proportion of fast-start plant in the NEM is going to increase to manage real-time volatility then market signals for slower-start generation may not likely be needed.

The implementation of the NEM's real-time market also delivers benefits similar to those of a day-ahead market. AEMO's pre-dispatch already signals expected market outcomes at a 30-minute resolution to the end of the next market day. The information in pre-dispatch means any scheduling improvement through the implementation of a day-ahead market may be limited.

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

Yours sincerely,

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