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Australian Energy Market Commission
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Investigation into system strength frameworks in the NEM Discussion Paper

Snowy Hydro Limited welcomes the opportunity to comment on matters raised in the Discussion Paper from the Australian Energy Market Commission (the Commission) on the Investigation into system strength frameworks in the NEM.

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. We are an integrated energy company with more than 5,500 megawatts (MW) of generating capacity. We are one of Australia's largest renewable generators, the third largest generator by capacity and the fourth largest retailer in the NEM through our award-winning retail energy companies - Red Energy and Lumo Energy.

As Australia's energy system undergoes a rapid transformation an essential part of the transformation is the system strength which will facilitate the transition. The energy industry's investment focus has shifted to a combination of renewables and enabling technologies with more than 3,000 megawatts of firm generation exiting the market in Australia in the past years. As part of the transition, synchronous generators will remain a vital source of inertia which help to limit the rate of change of frequency (RoCoF) when there are significant deviations in supply and demand along with synchronous plant primary suppliers of ancillary services that help to address frequency imbalances in the aftermath of any disturbance.

Snowy Hydro's existing hydro generators play a vital role in the market providing synchronous generation and Snowy 2.0 will provide longer-term energy storage, to replace retired assets currently providing the synchronous generation that is needed in the market. It is for this reason we believe that the following should be considered in any approach the Commission proposes moving forward:

- The need for a better understanding of the minimum levels of synchronous generation that will be needed over time to maintain system security,
- The coordination of the incentives and mechanisms by which system security services are provided will be essential in maintaining NEM system security at least cost; and;
- Options for the development of additional markets for ancillary services.

Snowy Hydro is supportive of mechanisms which ensure power system security can continue to be effectively and efficiently managed as we continue to transition to increasing levels of intermittent generation. It is therefore important that the Commission introduce processes into the NEM which place a value on the delivery of power system services, particularly given the observed decline in the amount of this important element in the suite of services that are needed to maintain a secure alternating current power system.

Context of this investigation and considerations for the provision of system strength

Snowy Hydro believes the current system strength frameworks have been important in maintaining system security to date. In 2017, when the current system was put in place, the frameworks were successful in maintaining the system.

With synchronous generators retiring and non-synchronous generators entering the market the pace of the transition has been rapid and has resulted in adding to the growing system strength deficit. It is for this reason Snowy Hydro understands that the frameworks need to evolve, allowing them to be agile and flexible.

Snowy Hydro agrees with the Commission that *"a major part of enabling this transition to an increasingly non-synchronous generation fleet will be to change in the way system security services are provided."*[1] It is therefore essential that there is a coordination of the incentives and mechanisms by which system security services are provided to maintain the NEM system security at least cost. Technologies that provide system strength however must be transparent and predictable with the appropriate incentives provided to those that provide the service. All approaches must be technology neutral in nature without favouring one technology over the other.

The roles for inertia and fast frequency response (FFR) need to be assessed in light of any other solutions determined in the current system reviews. The roles for these services are likely to be critical in the NEM. Snowy Hydro agrees with the inefficiencies noted by the Commission in separating the system strength and inertia framework. There needs to be a co-optimisation between the frameworks so there can be a linkage between the minimum system strength framework and the minimum inertia framework.

Models to evolve the framework

The Commission models have framed the consideration of how system strength can be planned for, procured, priced and paid for. From the developed options, Snowy Hydro supports a hybrid approach with planning and procurement coming from the Centrally coordinated model, but pricing and payment of the service coming from the Market based decentralised model.

For planning and procurement Snowy Hydro believes that AEMO or the TNSP should be made primarily responsible for contracting services. Our preference is that AEMO is tasked to carry out this function given its management of the electricity market and the responsibility they have to maintain and improve the power system security. To plan for the services required however AEMO must have complete visibility of the power system as a high priority. All technologies participating in the NEM must be price responsive bidding into central dispatch and scheduled to better assist AEMO to manage the power system. The proposal would provide AEMO with increased transparency on market participant behaviour and therefore the ability to produce more accurate pre-dispatch forecasts and dispatch outcomes. Maintaining good visibility of intermittent generators and maintaining robust forecasting models assists in the overall system operation and the integration of renewables. Anything less diminishes the visibility and accountability of forecast generation. It is for this reason Snowy Hydro has strongly advocated that all new technologies including demand response be scheduled and responsive if they participate.

[1] AEMC, Investigation into system strength frameworks in the NEM, 26 March 2020, p i.

Irrespective of which party is responsible for procuring system strength there needs to be clear policies and procedures developed to help ensure an efficient level of contracting. For example, to safeguard against the risk of under or over procurement the likelihood and consequence of an event versus the procurement costs to meet that level should be examined. Providing system strength requires consideration of the trade-off between the cost of providing additional system strength and the provision of market benefits through the release of constraints on the network by building additional network capacity, reducing the complexity of the connection process and "freeing up" capacity on the network to allow connection of more generation capacity.

When developing the new framework Snowy Hydro believes the prices and payment could still be delivered through a market approach where it is possible to do so. As a general principle, we believe that a market based approach enables a technically sound solution through the most efficient allocation of resources in the long term. The development of an efficient and effective policy mechanism requires a performance-based and incentivised approach that is consistent with the actions and the value these actions provide to the system. This will assist AEMO and market participants in enhanced transparency.

Snowy Hydro understands the Commission's concern *"that the capability of a market based model to provide necessary system strength services may not be capable of providing essential levels of this service in all regions"*[2]. It is therefore important where possible in certain regions to encourage market pricing to enable technology neutrality through the encouragement of existing and potentially new technologies. Providing the balance between investment certainty and flexibility to adapt to the changing market environment through an appropriate signal to incentivise the provision of the services. As synchronous condensers could be provided by either a generator or a network, the regulatory framework must ensure that the most efficient solution is implemented. This means that both participant types should be able to compete on an equal basis to the same regulatory funding and/or markets.

Snowy Hydro does not support the Mandatory service provision model. The Commission has correctly noted that the model would "*impose direct "active" system strength provision obligations on generators*"[3] and would utilise a generator obligation for the active provision given the level of system strength. A generator obligation would involve the imposition of a minimum technical access standard on each generator in the NEM to provide a specified level of system strength services, so that power system security is maintained[4]. This could, as noted by the Commission, lead to an "*obligation on generators to physically acquire or build the necessary equipment to meet the specified technical performance standard".*[5]

The existing rules contain a number of technical standards that connecting generators are required to meet in order to register in the NEM, the need for a mandatory approach would therefore be unnecessary. These technical standards are currently in the NEM to preserve the integrity of the power system by ensuring that the connecting generator does not degrade system security.

The cost of energy used to operate instead in a mandatory mode, which includes the associated operation and maintenance costs, would be ignored by this approach. Operating and capital costs are borne by Snowy Hydro for the provision of these services. The Commission also notes that the *"mandatory service provision model could impose unnecessary costs on newly connecting generators*

[2] AEMC, Investigation into system strength frameworks in the NEM, 26 March 2020, pp86

[3] AEMC, Investigation into system strength frameworks in the NEM, 26 March 2020, pp87

[4] AEMC, Investigation into system strength frameworks in the NEM, 26 March 2020, pp88

[5] AEMC, Investigation into system strength frameworks in the NEM, 26 March 2020, pp88

if technical requirements are overly onerous. These requirements' over specification could result in cost inefficiencies for provision of system strength in the long term".[6]

Inertia Markets

The performance of the frequency control markets and the basic thrust of the contingency services have worked quite well. With the transitioning energy system however there are conventional generators retiring and increases in inverter-based generating systems, which reduces inertia. The main issue now is that the current categorisations of the services are currently not always fit for purpose, particularly in potential islanding areas where there can be large amounts of Variable renewable energy (VRE) generation and low inertia. With increasing levels of inverter-based generation, the inertia of some subsystems like North Queensland, Tasmania and South Australia are already low at times of high VRE generation. This will get worse in the future. As the inertia reduces, frequency control becomes more challenging as there is less time available to address imbalances in supply and demand.

In early 2018, the Commission[7] was not satisfied that the introduction of a market mechanism for additional inertia for market benefit will meet the national electricity objective (NEO). One of the reasons at the time being the current power system operating conditions and the need to understand the practical outcomes from the new regulatory frameworks. At the time of consultation many stakeholders suggested delaying the introduction of a market for inertia until after the AEMC's Frequency control frameworks review is completed in mid-2018. Snowy Hydro believes this is the appropriate time to re-propose the inertia market[8].

The need for energy services such as Frequency Control Ancillary Services (FCAS), reactive power and inertia will continue to increase as the generation mix continues to change. An inertia market is therefore required to ensure that the current NEM energy only market design delivers ongoing security and reliability of electricity supply as the sectoral transformation continues.

For an inertia market, including synthetic inertia, we propose AEMO to monitor and correct real-time system inertia against an agreed system inertia standard which includes considerations for both global and localised distribution of inertia sources as well as proportions of real inertia against synthetic inertia. Under the proposed inertia market, the provision of inertia services are paid for by consumers of inertial services, modelled on the causer pays system. The inertia market must be a spot market to enable the procurement of varying quantities of inertia for varying network conditions.

Under the current frameworks, synchronous generation provides inertia for free. However, with the primary sources of inertia expected to continue to decline over time, becoming increasingly scarce, yet still a requirement for the NEM, it is prudent that the Commission now consider whether incentives such as an explicit price signal is needed to ensure that sufficient levels are available to maintain system security.

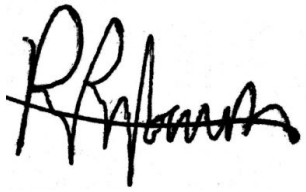
The effectiveness of an inertia market will be dependent on its ability to provide adequate incentives for the provision of the service. Snowy Hydro understands the difficulty in integrating an inertia price within the energy market price however we believe further assessment can be undertaken in an inertia spot market like the FCAS market where generators and synchronous condensers are evaluated. The Commission received a rule change request from Hydro Tasmania which proposes to

[6] AEMC, Investigation into system strength frameworks in the NEM, 26 March 2020, pp92
[7] AEMC 2018, Inertia Ancillary Service Market, Rule Determination, 6 February 2018, Sydney
[8] AEMC 2018, Inertia Ancillary Service Market, Rule Determination, 6 February 2018, Sydney

address this issue by integrating the dispatch of a “synchronous service” with the existing energy and FCAS spot markets. The Hydro Tasmania rule change request which proposes a market-based model for the provision of "synchronous services" should be further assessed as a starting point to this discussion.

Snowy Hydro appreciates the opportunity to respond to the Discussion Paper and any questions about this submission should be addressed to panos.priftakis@snowyhydro.com.au.

Yours sincerely,



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