

13 August 2020

Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Submitted by email to aemc@aemc.gov.au

Project number: ERC0290

System services rule changes Consultation paper

Snowy Hydro Limited welcomes the opportunity to comment on matters raised in the Consultation paper from the Australian Energy Market Commission (the Commission) on System services rule changes.

The success of the NEM rests with decentralised decision making, liquid and deep contract markets and stable regulatory frameworks. System security and reliability remains a critical aspect of effective energy delivery which should be achieved through minimal market intervention. Snowy Hydro supports competitive markets being used or developed to deliver the required energy and ancillary services with all forms of interventions remaining a last resort and not distorting the market.

The Australian Energy Market Operator (AEMO) is currently being forced to intervene in the NEM. The repeated need for interventions in the South Australian region has sometimes been referred to as evidence of a market failure. However, it is necessary to distinguish between a failure of market design, and the lack of appropriate markets included within a market design.

Evidence from the NEM is that the security and reliability of supply is increasingly challenging but responses to these challenges through recent rule changes, such as the Mandatory Primary Frequency Control Ancillary Services (FCAS) rule change are inadequate for the long term efficient operation of the NEM. Given the transformation underway, not all services required for the efficient, secure and reliable operation of the changing system are being valued or appropriately procured. As a result, the power system is experiencing or approaching binding limits across a range of technical and economic parameters.

Energy reserves and ramping services are also critical for system reliability. The tight supply and demand balance in the NEM however has also led to an increase in out of market interventions. Increases in the procurement, enablement, and activation of out-of-market Reliability and Emergency Reserve Trader (RERT) capacity has distorted the market and increased consumer costs. The current NEM design has the right structures and mechanisms in place to respond to changing system needs and to incentivise supply to be available when the system needs it. Nevertheless we believe further work should be done in assessing Operating reserves which could provide a more efficient alternative to RERT procurement and directions, as the proposal draws capacity into the market rather than outside of it. This approach is more transparent for the market to understand the actual costs of strategic reserves.

Snowy Hydro's views on the Consultation paper that are most critical to achieving a successful long-term NEM that provides reliability and security are as follows:

- The NEM will continue its significant transformation to high levels of renewable generation which is expected to test the boundaries of system security and current operational experience.
- 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.
- Under the Primary frequency response incentive arrangements rule change request the focus should remain to effectively remunerate providers of primary frequency response and sunset the Mandatory primary frequency response.
- With AEMO's increasing reliance on intervention mechanisms, it is sensible to consider an Operating Reserve mechanism that has capacity participating in the market rather than outside of it.
- An Operating Reserve mechanism however still needs to be further assessed. With AEMO being responsible for determining target quantities to be procured through the operating reserve, the market could be left with a scenario where AEMO's continues to use RERT and directions along with the operating reserve costing consumers more than what previously was intended.
- AEMO or the TNSP should be made primarily responsible for contracting services. To plan for the services required, however, AEMO must have complete visibility of the power system as a high priority. Maintaining good visibility of intermittent generators and maintaining robust forecasting models assists in the overall system operation and the integration of renewables.
- 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. A Synchronous services market is required however the effectiveness of an inertia market will be dependent on its ability to provide adequate incentives for the provision of the service.

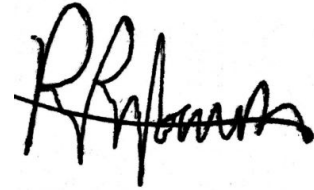
These system strength changes proposed are linked with ESB's Scheduling & Ahead Markets market design initiative and the ESB's Essential System Services market design initiative. Snowy Hydro therefore believes that the Commission should continue to progress its assessment of the separate rule changes, but that recommendations should be implemented in the Post-2025 review by the ESB rather than a separate approach. There needs to be a coordinated approach between the Commission and the ESB.

About the Snowy Hydro Group

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. Collectively, they retail gas and electricity in South Australia, Victoria, New South Wales, Queensland and the ACT to over 1 million customers.

Snowy Hydro appreciates the opportunity to respond to the Commission on the Consultation Paper on the System services rule changes and any questions about this submission should be addressed to panos.priftakis@snowyhydro.com.au.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'P. Priftakis', with a horizontal line drawn through the middle of the signature.

Panos Priftakis
Head of Wholesale Regulation
Snowy Hydro



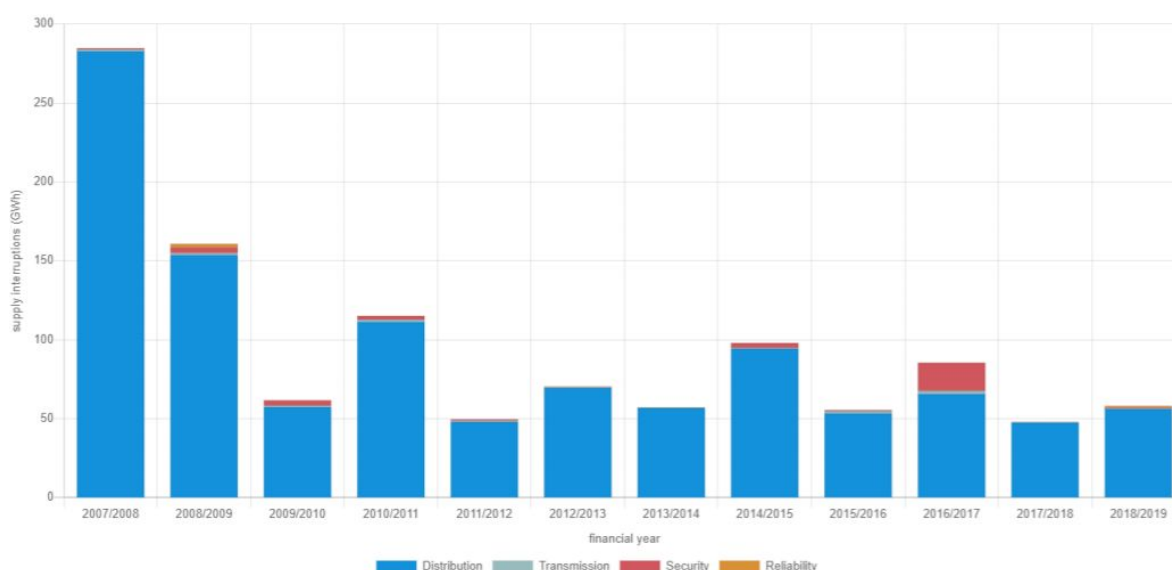
System strength in the NEM	5
Dispatch work stream	7
Operating reserve market	8
Investment work stream	10
Synchronous services markets	10



System strength in the NEM

The NEM has historically delivered security and reliability. Between 2007/08 and 2018/19, there were 3.4 GWh of interrupted supply due to insufficient resource adequacy, either by insufficient generation, demand response and/or interconnection. This represents approximately 0.29 per cent of total supply interruptions across the period, where the vast majority is caused by network interruptions, followed by security-related interruptions (e.g. frequency and voltage issues). Show in figure 1 below.

Figure 1: Sources of supply interruptions in the NEM¹



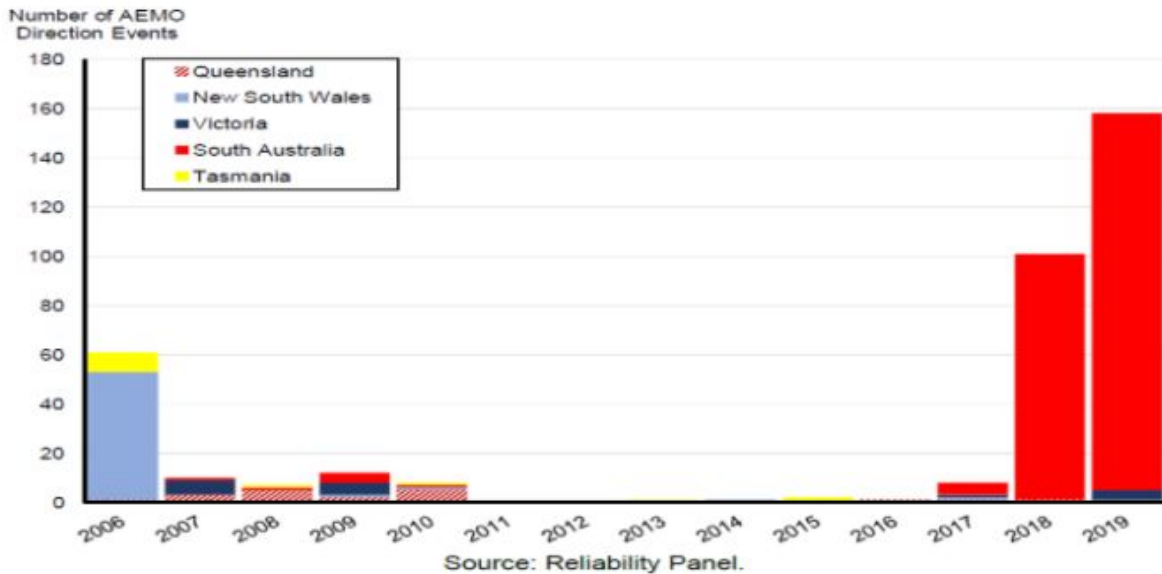
Snowy Hydro therefore believes the current system strength frameworks have been important in maintaining system security to date. In 2017, when the current system was put in place, the frameworks were successful in maintaining the system.

With synchronous generators retiring however 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.

It is necessary to distinguish between electricity market design failure, and "Missing Markets" that would provide the appropriate incentives. This is a case of a "Missing Market". Alternate market designs would not reduce the number of AEMO interventions. Only identification, pricing and scheduling of the relevant services and constraints will achieve this. The long run, least-cost solution to inadequate System Strength is to reduce future AEMO interventions. The increased number of AEMO interventions is shown below.

¹ Reliability Panel, 2019 Annual market performance review, Final report, 12 March 2020

Figure 2: Number of AEMO Interventions²



AEMO recently released their Renewables Integration Study (RIS) Report³ which finds that the NEM will continue its significant transformation to high levels of renewable generation and is expected to test the boundaries of system security and current operational experience. The report recognises a number of challenges and actions in the following key areas:

- Secure system operation with increasing uncertainty and complexity
- Managing Solar PV
- Frequency management
- Maintaining system strength
- Keeping system balance with uncertain energy supply

It is for this reason that a major part of enabling this transition to an increasingly non-synchronous generation fleet is to change the way system security services are provided. There needs to be 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 with co-optimisation between the frameworks so there can be a linkage between the minimum system strength framework and the minimum inertia framework.

² Source: Reliability Panel

³ AEMO, 2020, *Renewable Integration Study: Stage 1 report*

Dispatch work stream

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.

The dispatch work stream which considers the Fast frequency response market ancillary service rule change is a sensible approach to consider. As synchronous inertia in the power system decreases, the rate of change of frequency (RoCoF) following contingency events increases, which increases the need for a faster acting frequency response to meet the requirements of the power system frequency operating standard. Fast-acting technologies can manage risks associated with system frequency in a low inertia system, including the management of RoCoF.

Snowy Hydro believes that the fast frequency response market ancillary service should operate in a similar manner to the existing market arrangements for FCAS. AEMO should determine the specifications for the FFR service in the Market Ancillary Services Specification (MASS) and the market would be open to generation, loads and aggregators. Introducing the FFR service could help reduce overall volumes of services required to operate the system.

Appropriately structured incentives that align with existing market structures continue to be the most cost effective and efficient means of supporting the provision of primary regulating response and addressing the current concerns with frequency performance. A market based mechanism, appropriately aligned with power system stability fundamentals, enables a technically sound solution through the most efficient allocation of resources in the long term. Additionally, a technically sound solution is more likely to be realised through industry consultation rather than one directed solely by AEMO.

It is for this reason Snowy Hydro strongly opposed the Mandatory Primary Frequency Control approach which was not a complete or long-term solution and as the Commission noted requires incentives for the provision of primary frequency response following the sunset of the mandatory rule change⁴. We support the Commission's consideration of a market based mechanism that appropriately aligns with power system stability fundamentals and enables a technically sound solution through the most efficient allocation of resources in the long term. Under the Primary frequency response incentive arrangements rule change request the focus should remain to effectively remunerate providers of primary frequency response and sunset the Mandatory primary frequency response⁵.

⁴ AEMC, Mandatory primary frequency response, Draft rule determination, 19 December 2019

⁵ AEMC, System services rule changes, Consultation paper, 2 July 2020

Operating reserve market

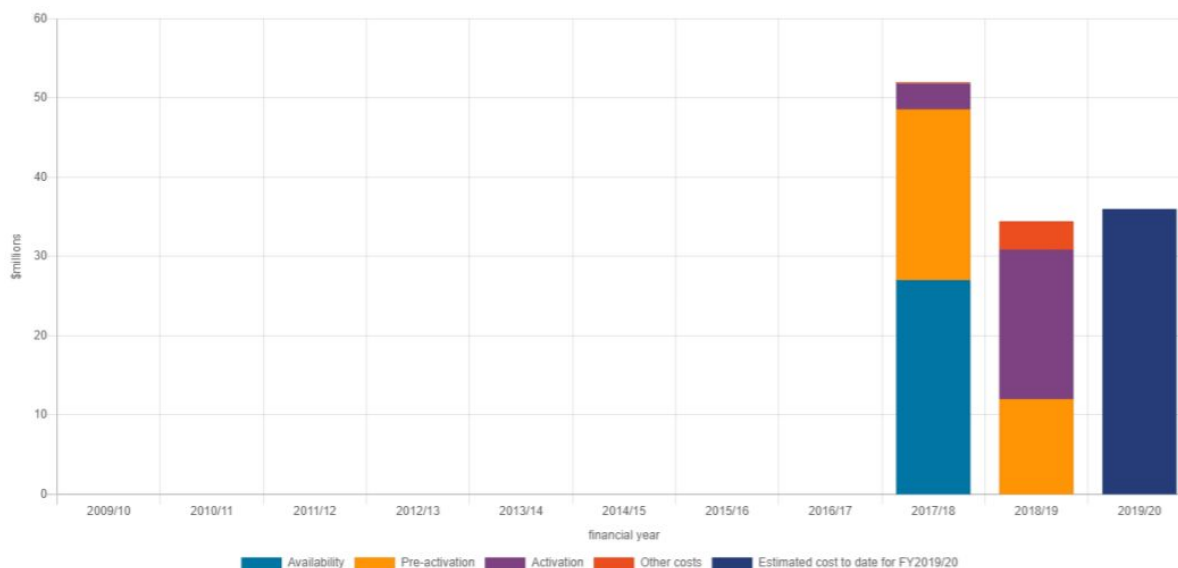
The design features of the NEM's energy-only market are well-understood and the market setting should be strong enough to signal the need for new investments to maintain reliability and security. In considering any enhancements to the market design, the Commission should always give priority to the primary market signals of Unserved Energy (USE), Maximum Price Cap (MPC), Minimum Floor Price (MFP), and Cumulative Price Threshold (CPT) at first point. In particular, the Commission should consider increasing the MPC as the primary means to improve system security. A higher MPC would not pose a systemic risk to Market Customers. Rather, it would address the moral hazard associated with an artificially low MPC and CPT which encourages under-contracting and which reduces investment in peaking capacity. This reform would also avoid the need for complicated reserves or capacity mechanisms, and would impose no additional administrative burdens on either participants or the market operator.

Snowy Hydro submits that should there continue to be a need for reserves, they should be transparent and only be used as a last resort safety net with the energy-only market left to deliver the economic level of bulk supply reliability to customers. With this in mind and AEMO's increasing reliance on intervention mechanisms, it is sensible to consider a mechanism that has capacity participating in the market rather than outside of it. An Operating Reserve would draw resources into the market however more work needs to be undertaken to assess how it would operate in the market as the proposal would require the handling of new dispatch bids, constraint equations and other software changes within AEMO, which would need to be addressed.

Snowy Hydro understands the challenges AEMO faces in managing energy supply. Providing a market price signal for Operating Reserves would be more efficient than AEMO interventions and reducing the quantity of out-of-market RERT which would be required to be purchased to achieve the same reserve levels. In addition it would improve transparency, through a visible procurement process, in the market by clearly pricing the trade-offs between different options for managing system security. Transparency of strategic reserves is important to provide more certainty for participants on the costs.

The operating reserves will represent a cost to consumers, however if they are in good supply and effective, during times when they are priced to reflect the need. This according to the operating reserves rule change would remove reserves needed for RERT which has cost \$35-52m per year, with the costs highlighted below.

Figure 3: Costs of RERT use⁶



The NEM will still have some form of regulatory mechanism that has allowed AEMO to contract for emergency reserves along with numerous other intervention mechanisms such as Directions and Instructions which could be utilised in cases of genuine market shortfall. RERT in the Short-Notice or Medium-Notice RERT are currently appropriate tools which allows AEMO to purchase reserves 7 days and 10 weeks respectively from the anticipated shortfall, providing an appropriate trade-off for maintaining sufficient levels of unserved energy in the NEM. There is a trade-off with cost per unit of the Short-Notice RERT and Medium-Notice RERT being more expensive than a multi-year out of market capacity reserve, multi-year mechanisms which imposes significant long-term costs in deterring new capacity from entering the market.

The proposal notes that reserves would be paid the marginal 'availability' price when called, with the market price cap applied. It is unclear whether there will be sufficient participants in the operating reserves if the MPC does not increase for the operating reserve. The Commission should assess whether the participation could be diminished without a price greater than the MPC or whether they need to consider a availability payment and the energy payment.

The signals for long term investment signals could also be impacted as operating reserves could be seen as another revenue stream for existing dispatchable resources that would otherwise retire or be mothballed. This would not directly facilitate new investment. In addition, with AEMO being responsible for determining target quantities to be procured through the operating reserve, the market could be left with a scenario where AEMO continues to use RERT and directions along with the operating reserve costing consumers more than what previously was intended.

Should there continue to be out of market resources used by AEMO, it is more efficient for these resources to be drawn into the market which would provide additional hedging products for the benefits of retailers and customers, and therefore making additional

⁶ Reliability Panel, 2019 Annual market performance review, Final report, 12 March 2020

lower-cost contracting available to consumers. The benefit from greater flexibility and certainty AEMO will obtain from Operating Reserves should allow the removal of the:

- Interim Reliability Reserve Rules - multi-year out of market capacity reserve;
- Victorian Jurisdictional Derogation final rule for multi-year contracting of RERT; and;
- Long-notice RERT.

With all three to all be unnecessary costly mechanisms if the operating reserve works as intended.

Investment work stream

Snowy Hydro believes that AEMO or the TNSP should be made primarily responsible for contracting services. To plan for the services required however AEMO must have complete visibility of the power system as a high priority. 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,

All technologies participating in the NEM must also be price responsive, bidding into central dispatch and scheduled to better assist AEMO to manage the power system. This 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.

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.

Synchronous services markets

Snowy Hydro supports the creation of synchronous services markets for synchronous services such as inertia, voltage control and fault level/system strength. 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.

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.

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 synchronous services markets proposes to address this issue by integrating the dispatch of a "synchronous service" with the existing energy and FCAS spot markets. It is important that the proposal is effective in addressing a number of key issues identified with our current system strength frameworks with minimal disruption to the market which is why further detail is required. The market could lead to two sets of spot prices for example, which could dilute the contract market, and requires further assessment or consideration of a discrete synchronous services market, with separate settlement to energy to minimise the impact on the contract market.

AEMO should 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.