21 July 2022

Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Submitted by email to aemc@aemc.gov.au

Project number: ERC0339

**Essential system services and inertia in the NEM**

Snowy Hydro Limited welcomes the opportunity to comment on matters raised in the Joint Paper from the Australian Energy Market Commission (the Commission) and the Australian Energy Market Operator (AEMO) on Essential system services and inertia in the NEM.

The need for inertia is critical to the NEM as the generation mix continues to change. Inertia has historically been provided by synchronous generators, such as coal, gas, and hydro, however with the retirement of thermal generation and increase in inverter-based generating systems we will see a reduction in inertia. It is for this reason an inertia market is required to ensure that the current NEM energy-only design delivers ongoing security and reliability of supply as the energy transition continues.

The deteriorating reliability of the coal fleet and the current energy crisis in the NEM has exposed both the chronic underinvestment in the coal assets, and the need for appropriate revenue sources to sustain increased levels of investment. It is for this reason an inertia market, a revenue stream for generators capable of supplying inertia, is required to ensure that the NEM delivers ongoing security and reliability of supply as the energy transition continues.

As the Joint Report clearly highlights, Australian Energy Market Operator (AEMO) forecasts strong declines in inertia below secure operating levels in both New South Wales and Victoria over the 5-year horizon to 2026 in addition to existing shortfalls declared in South Australia and Tasmania, with further possible shortfalls identified for Queensland beyond 2026. There therefore needs to be appropriate incentives to encourage this investment in the NEM moving forward.

The Energy Security Board (ESB) correctly identified a spot market approach for valuing and procuring inertia. The effectiveness of an inertia market will depend 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 co-optimised. Should this take a longer period of time to develop, as the Joint Paper notes 4 years, then the Commission should be actively working on ways to value inertia separately.

The need for structured procurement of inertia, however, does not imply a need for a unit commitment for security (UCS), operating reserves or a Fast Frequency Response (FFR) market; they should not be bundled together with any of those single reforms. Inertia is currently not valued separately which means current arrangements are not fit for purpose for the changing market conditions. Throughout the ESB process and through the Joint Paper, AEMO have requested the necessary tools to commit to ancillary services transactions however at no stage have AEMO clarified why they need any new mechanisms, Unit Commitment or an operating reserve is not a pre-condition or a replacement for valuing and reporting inertia.

An inertia market is an immediate critical reform to deliver ongoing security and reliability of supply as the energy.

**Role of Joint Paper**

The publication of this joint paper ahead of the consideration of the rule change provides a broad update of the progress on a number of issues however implies certain views not presently shared by both industry and the Energy Security Board's (ESB). These include concerns on inertia being purchased via a spot market approach and the need for the development of inertia markets to form part of the longer-term Essential System Service work.

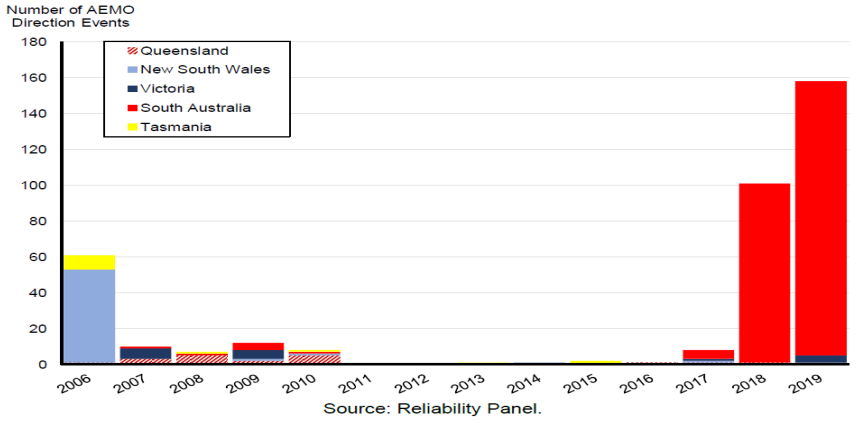
Care should be taken in releasing future joint papers between the Commission and the Australian Energy Market Operator (AEMO). The Commission should be, and should be seen to be, independent of AEMO and should not blur responsibilities. AEMO, focused as it is on the operating environment, may not consider the incentives for future investment in the NEM necessary for an appropriate level of inertia in the market. Inertia as noted earlier will continue to decline and there needs to be proper incentives in the future should that decline to be filled by new investments.

The current rule-making arrangements in the NEM were deliberately structured to ensure that the Australian Energy Market Commission (AEMC) was independent of the other regulatory bodies. This has enabled an independent and fair rule making process. While advice from AEMO is welcome, this should be at arm's length and focused on suggesting preferences for certain proposals.

The Joint Paper has not considered the positive impacts that a well functioning inertia market would have on the NEM. In recent years we have seen a troubling development in the form of increased system strength related market intervention that should be a greater concern, given their cost impacts. The greater uncertainty, variability and growing proportion of variable renewable generation (on-grid and behind the meter); an aging fleet of thermal generation; and unexpected retirement of capacity increasing risk of forced outages has increased the amount of interventions by the operator. These interventions have been ultimately funded by consumers and are more expensive alternatives than operating an efficient market to solve the system issues such as frequency control and inertia.

This is a case of a "Missing Market" (i.e. unpriced inertia) and not about increasing costs on consumers or on AEMO. Only identification and pricing of the relevant services and constraints will achieve this. For example, looking at the SA example, a key precipitating factor in the recent rush to high levels of interventions was triggered by the much publicised consumer distress during the SA blackout event in 2016. The long run, least-cost solution to inadequate System Strength proved to be the installation of four synchronous condensers (at a cost to consumers of $166 million) to reduce future AEMO interventions[1].

Figure 1: Number of AEMO Interventions [2]




[1] *Paul Simshauser and Joel Glimore, 2020,"Is the NEM broken? Policy discontinuity and the 2017-2020 investment megacycle" University of Cambridge, Energy Policy Research Group*

[2] *Paul Simshauser and Joel Glimore, 2020,"Is the NEM broken? Policy discontinuity and the 2017-2020 investment megacycle" University of Cambridge, Energy Policy Research Group*

**Role of Inertia Spot Market versus other initiatives**

Snowy Hydro welcomes ongoing technical research and analysis to ensure that the needs of the power system are provided to support a secure system. The main issue now is that the current categorisations of the services are 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 continue to worsen in the future across all states.

The Joint Paper claims that operating reserves, fast frequency response market, Unit Commitment for Security (UCS) and System Security Mechanism (SSM) would obviate a need for a spot market in inertia. Snowy Hydro does not hold this view and while there may be value in some of these proposals they are not an alternative to an inertia market.

An inertia market is required, separate to an FFR market, to ensure that the current NEM energy-only design delivers ongoing security and reliability of supply as the energy transition continues. In 2020, the Commission's Frequency control rule changes Directions Paper correctly acknowledged that *"FFR" is not a direct substitute for synchronous inertia*[3]. It noted "*while FFR can help control system frequency during low inertia operation, a minimum quantity of synchronous inertia will continue to be required over the medium term*."[4] AEMO's Fast Frequency response specification and consultation report clearly identified that FFR and inertia are delivered via different physical mechanisms and are not directly interchangeable[5]. The need for ancillary services such as more flexible frequency control services, voltage and reactive power control, system strength, and inertia will continue to increase and should independently be assessed.

While Snowy Hydro supports reforms to value system services, we are concerned that proposals for a UCS, and SSM are being unnecessarily characterised as part of and justified by the need for those reforms. The UCS/SSM do not form part of the critical path to creating markets for system services, being primarily a scheduling mechanism designed to address AEMO's lack of confidence in the current dispatch process. UCS/SSM have evolved from and bear many similarities with earlier attempts to introduce an ahead market. As such, these mechanisms should be assessed separately, with any crossover with the Commission's work on system services being addressed on an as-needs basis.

The ESB Post 2025 market design noted *"the unit commitment for security (UCS) is a mechanism where AEMO, can schedule resources contracted through structured procurement ahead of time to keep the system secure when dispatch and real-time do not"*[6] without acknowledging that many of the benefits of unit commitment are already addressed by the forward contract market that supports the NEM's real-time market. In not acknowledging these existing benefits this UCS mechanism has not been well understood and it will only impose unnecessary costs and risks on market participants without corresponding benefits. It is for this reason that an inertia market cannot be replaced by a UCS mechanism; it is not a substitute.

Accordingly, proposals for a UCS/SSM should be assessed independently and on their merits. Attempts to bundle these mechanisms with system service reforms risks further delaying the introduction of missing markets for system services and undermining system security.

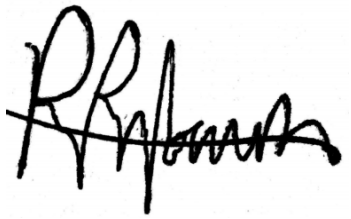
The Commission should prioritise arrangements such that system services are provided within energy and FCAS markets, without the need for any other mechanism. AEMO has provided no detail on exactly how the mechanism will function in terms of procuring and activating contracts and how procurement and dispatch will interact with the rules.

---

[3] AEMC, Frequency control rule changes, 17 December 2020, pp19
[4] *AEMC, Frequency control rule changes, 17 December 2020, pp19*
[5] *AEMO, Fast frequency response specification – Release of GE energy consulting report, 15 March 2017, p.1-3.*
[6] *ESB, Post 2025 Market Design Options – A paper for consultation Part A, pp47*

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

Yours sincerely,



Panos Priftakis
Head of Wholesale Regulation
Snowy Hydro