



Your ref: ERC0339

11 April 2023

Australian Energy Market Commission
GPO Box 2603
Sydney NSW 2000
Submitted online at: www.aemc.gov.au

Dear Amy Wiech/John Kim

Submission: Draft Determination – Efficient provision of inertia

CS Energy welcomes the opportunity to provide a submission to the Australian Energy Market Commission (**AEMC**) Consultation Paper on the *Efficient provision of inertia (Paper)*.

About CS Energy

CS Energy is a proudly Queensland-owned and based energy company that provides power to some of our state's biggest industries and employers. We employ almost 500 people who live and work in the Queensland communities where we operate. CS Energy owns and operates the Kogan Creek and Callide B coal-fired power stations and has a 50% share in the Callide C station (which it also operates). CS Energy sells electricity into the National Electricity Market (**NEM**) from these power stations, as well as electricity generated by Gladstone Power Station for which CS Energy holds the trading rights.

CS Energy also provides retail electricity services to large commercial and industrial customers throughout Queensland and has a retail joint venture with Alinta Energy to support household and small business customers in South-East Queensland.

CS Energy is creating a more diverse portfolio of energy sources as we transition to a new energy future and is committed to supporting regional Queensland through the development of clean energy hubs at our existing power system sites as part of the Queensland Energy and Jobs Plan (**QEJP**).

Key recommendations

The power system is undergoing unprecedented change with the uptake of new generation technology as the system transitions to a lower carbon footprint. This transition will bring changes in how power system security is managed. A key feature of power system

■ **Brisbane Office**
PO Box 2227
Fortitude Valley BC Qld 4006
Phone 07 3854 7777
Fax 07 3854 7300

□ **Callide Power Station**
PO Box 392
Biloela Qld 4715
Phone 07 4992 9329
Fax 07 4992 9328

□ **Kogan Creek Power Station**
PO Box 41
Brigalow Qld 4412
Phone 07 4665 2500
Fax 07 4665 2599

operations is frequency management with inertia being an integral component and key contributor to the achievement of the Frequency Operating Standards (**FOS**) and delivery of power system security.

This submission avoids focussing on the final solution, instead directs attention to the principles CS Energy considers will be necessary to contribute to the efficient provision of inertia in the NEM. The objective is to ensure that the essential system services are individually characterised through the development of standards and frameworks for each, facilitating the progressive elimination of the 'missing markets' for essential system services including inertia.

The Reliability Panel recently made a final determination¹ to revise the FOS that included the following commentary² in the release notes.

*'.....introduction of system limits for rate of change of frequency (**RoCoF**) following contingency events that would likely involve the failure or sudden and unexpected removal of a generating unit or transmission element from the power system*

The proposed RoCoF limits in the revised FOS will formalise AEMO's existing operational practices in light of reducing levels of system inertia, helping to manage the risks of contingency events, such as the failure of network infrastructure.

These arrangements will have flow-on benefits, promoting the timely investment of the services, such as synchronous and synthetic inertia, needed to help manage RoCoF after a contingency event.

They will also support the implementation of new fast frequency response market ancillary services that can be provided by inverter-based technologies such as wind, solar PV, battery and demand-side resources.'

This aligns with CS Energy's position set out in its submission³ to the consultation preceding the Final Determination.

CS Energy framed its submission to suggest delivery of the FOS RoCoF through the provision of a combination of rotational inertia and synthetic inertia. This approach is technology neutral to the extent the providers of rotational inertia and synthetic inertia must satisfy the technical specifications that will form part of the final efficient provision of inertia framework.

CS Energy agrees with the principle of being informed to the extent possible on the role of inertia in delivering power system security including the FOS and the framework for the efficient provision of inertia. However, CS Energy is concerned that this will lead to a prolonged development timeframe which is not necessary as there is already ample evidence in forums that inertia is being measured and projected shortfalls have been identified. Furthermore, the management of power system security has identified inertia shortfalls through the issuing of directions. The references include but are not limited to:

- AEMO Constraint Formulation Guidelines⁴ (inertia referred to on three (3) instances);

¹ <https://www.aemc.gov.au/sites/default/files/2023-04/REL0084%20-%20Final%20Determination.pdf>

² [Final determination for frequency operating standard | AEMC](#)

³ https://www.aemc.gov.au/sites/default/files/2023-02/CS%20Energy%20Limited%20-%20Submission%20to%20Frequency%20Operating%20Standard%20Review_1.pdf

⁴ https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/congestion-information/2021/constraint-formulation-guidelines.pdf?la=en

- AEMO Constraint Implementation Guidelines⁵ (inertia referred to on eight (8) instances);
- AEMO Power System Frequency Risk Review July 2022⁶ (inertia referred to on thirty-eight (38) instances);
- AEMO 2022 Inertia Report;⁷ and
- AEMO recommendations arising from the Queensland and South Australia system separation on 25 August 2018 – Incident Report⁸ included recommendation no. 3 in Table 1.

In 2018 AEMO published the 2018 Inertia requirements methodology⁹ describing the methodology AEMO uses to define inertia sub-networks in the NEM, and the calculation methods to determine satisfactory and secure inertia levels required to be available in these sub-networks. In 2020 AEMO published additional information about inertia in the Power System Requirements reference paper¹⁰.

The Paper states that further investigative work will be required without providing any details of what remains outstanding in addition to the studies already completed by AEMO on inertia. CS Energy is disappointed and concerned that this further investigative work around inertia and/or RoCoF has not been completed, thus potentially precluding invaluable input to the development of, or result in extended delays to, the final efficient provision of inertia framework.

In 2021 AEMO published the Notice of Tasmania system strength and inertia shortfalls¹¹ paper declaring an inertia shortfall against the secure operating level of inertia requirement from May 2021 to May 2026. The industry is aware that AEMO and the Tasmania jurisdiction have for some time conducted an operational inertia mechanism utilising constraints and pre-dispatch. No public information has been published on the mechanism and its effectiveness. In the absence of any information and learnings, CS Energy views this outcome as a lost opportunity in providing valuable input to this consultation.

CS Energy is greatly concerned with linking of the final efficient provision of inertia framework with the Operational Security Mechanism (**OSM**)¹². The OSM is viewed as a power system security management application notwithstanding industry opposition to the OSM in the most recent consultation. In the event a robust and efficient provision of inertia framework is produced, and not withstanding any required optimisation, power system security should be delivered through this framework in a transparent manner removing the requirement for inertia to be included in the OSM.

References to ‘double dipping’ need to be clarified as it gives the impression that service providers are being paid more than once for the same service. It should not be conflated with provision of multiple services including energy, Frequency Control Ancillary Services (**FCAS**) and other essential power system services including inertia or equivalent. The

⁵ https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/congestion-information/2021/constraint-formulation-guidelines.pdf?la=en

⁶ https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/congestion-information/2021/constraint-formulation-guidelines.pdf?la=en

⁷ https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/operability/2022/2022-inertia-report.pdf?la=en

⁸ https://aemo.com.au/-/media/files/electricity/nem/market_notices_and_events/power_system_incident_reports/2018/qld---sa-separation-25-august-2018-incident-report.pdf?la=en&hash=49B5296CF683E6748DD8D05E012E901C

⁹ https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/system-security-market-frameworks-review/2018/inertia_requirements_methodology_published.pdf?la=en

¹⁰ https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power-system-requirements.pdf?la=en&hash=04F4669E6663B1763086B291B463C0A5

¹¹ https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/operability/2021/2021-notice-of-tasmania-system-strength-and-inertia-shortfalls.pdf?la=en

¹² [Operational security mechanism | AEMC](#)

Service provider should receive the appropriate payment for each of the services provided as accounted for in the power system security assessment. The objective must be to:

- eliminate the 'missing markets' where on occasions services that have been provided are not being remunerated for that provision; and
- therefore, establish the necessary incentives for future investment in these services.

It is imperative that the final framework produces the appropriate market signals to deliver sustainable investment in the service while at the same time valuing the provision of the service in an operational timeframe. Delivering this outcome would provide confidence that AEMO utilisation of directions for this service would be a last resort.

CS Energy strongly advocates for the development of inertia or RoCoF reserve level declaration guidelines analogous to NER clause 4.8.4A *Reserve level declaration guidelines*¹³. The objective would be to provide the appropriate levels of situational awareness to the market so that in the event of an actual or forecast shortfall a market response would be sought and, in the absence of a sufficient market response, AEMO would resort to directions to maintain power system security. Generation of such market signals underpins the spot market framework.

Responses to Consultation Questions

Q1: Technical information

In addition to the comments above, CS Energy supports the formation of an industry Technical Working Group (**TWG**) to capture the work performed to date on this service and identify the remaining deliverables to enable the development of the efficient provision of inertia or equivalent framework. In the event of a RoCoF market ancillary service, it would require the inclusion of the technical requirements in the Market Ancillary Service Specifications (**MASS**) with which service providers would need to comply. Specification of rotational inertia and synthetic inertia would be key deliverables.

Realigning the provision of inertia through a RoCoF framework should not diminish, undermine or complicate the provision of the required power system security requirement. A market mechanism incorporating a spot market framework should be viable.

Q2: Inertia procurement and allocation in real-time

The preferred outcome is the spot market approach as it is assessed as providing the most efficient market outcome.

Contracting of services does not provide sufficient levels of detail to establish the required market signals, particularly for investment purposes.

Following the recent completion of the rule change for Fast Frequency Response (**FFR**) Market Ancillary Service¹⁴, CS Energy envisages that a similar outcome could prevail for the inertia or equivalent service. This is likely to minimise the implementation costs particularly if it can be incorporated into existing AEMO NEMDE IT architecture.

¹³ <https://energy-rules.aemc.gov.au/ner/452/228598#4.8.4A>

¹⁴ [Fast frequency response market ancillary service | AEMC](#)

Q3: Investment signals for inertia

The AEC rule change proposal and the consultation paper details the investment signals expected to be delivered through the final framework by:

- Addressing the current missing market for the service;
- Appropriately valuing the service;
- Providing transparency;
- As previously stated, incorporate the development of inertia or RoCoF reserve level declaration guidelines that will provide an insight to the supply/demand balance for the service subsequently translating into market signals; and
- Developing a spot market approach which is considered to deliver higher levels of transparency and efficiency when compared to contractual arrangements.

Q4: Will the AEC's proposed solution best address the problems raised

CS Energy is confident that the proposed framework will address the stated challenges.

However, there is concern with the coupling of a derivative contracting market to the spot market for the service as detailed in the Consultation paper in section 3.1.2 in the initial design. CS Energy would support the emergence of a derivative market as a natural progression of the implementation of the spot market for the service if the risk warranted the development of a derivative market. It would be driven by market forces not prescribed as a condition or requirement. It is noted the FCAS spot market has resulted in very limited and region-specific attempts of a derivative market over the last 20 years.

CS Energy supports a common clearing price spot market. Ironically, if the need for a derivative market was identified it would be supported by the common clearing price feature and in turn provide market and investment signals.

CS Energy only supports the exclusion of monopoly Network Service Providers (NSP) from receiving spot market payment but not from the supply calculations. Otherwise, this would be an example of 'double dipping' if the revenue was a combination of the cleared spot price and the allowable regulated revenue. The NSP would not be excluded from providing the services provided it satisfied the RIT-T or RIT-D requirements.

Q5: Alternative options

As previously stated, CS Energy does not support the conflation of the proposed OSM and the potential inertia or RoCoF spot market. A well designed and functioning inertia or RoCoF spot market would eliminate that service being managed in the OSM.

As a spot market is being developed, CS Energy supports the current structured procurement process with a sunset clause linked to the spot market being declared operational. CS Energy has previously stated that the technical work to date has not been fully publicly available. Consolidation of the various workstreams on the subject and the formation of an industry TWG should minimise the amount of time to address the technical challenges and proceed to the implementation of the spot market.

Conclusions and recommendations

CS Energy provides the following recommendations in the development of an efficient framework for inertia:

- Reframe the efficient provision of inertia to efficient provision of RoCoF;
- Progress the development of a RoCoF market ancillary service;
- Incorporate the technical requirements for the RoCoF market ancillary service in the MASS;
- Incorporate the RoCoF market ancillary service in the NEM dispatch process including co-optimisation with existing energy and market ancillary services;
- Develop the RoCoF reserve level declaration guidelines;
- Decouple the RoCoF market ancillary service from a potential OSM; and
- Establish a common clearing RoCoF spot price with payment to all service providers except for NSP providers.

If you would like to discuss this submission, please contact Henry Gorniak on 0418 380 432 or hgornik@csenergy.com.au or myself on 0407 548 627 or ademaria@csenergy.com.au.

Yours sincerely



Dr Alison Demaria
Head of Policy and Regulation