



Ms Anna Collyer  
Chair  
Australian Energy Market Commission  
GPO Box 2603  
Sydney NSW 2001

06 February 2025

Dear Ms Collyer,

**Efficient provision of inertia – directions paper**

ENGIE Australia & New Zealand (ENGIE) welcomes the opportunity to respond to the Australian Energy Market Commission's (AEMC) directions paper seeking to assess whether inertia exhibits the necessary economic characteristics to justify implementing an operational procurement mechanism, such as a spot market.

The ENGIE Group is a global energy operator in the businesses of electricity, natural gas and energy services. In Australia, ENGIE operates an asset fleet that includes renewables, gas-powered generation, and battery energy storage systems. ENGIE also provides electricity and gas to retail customers across Victoria, South Australia, New South Wales, Queensland, and Western Australia.

ENGIE is broadly supportive of conclusions drawn by the HoustonKemp analysis, which determined that a contracting framework may be an effective market structure to procure minimum inertia, while operational procurement for additional inertia may have a role to play in delivering benefits to consumers and market participants. ENGIE supports further technical analysis to assess whether the expected benefits outweigh implementation and operational costs, including whether a spot market could support all inertia procurement once emerging technologies further mature.

ENGIE's response to this consultation paper provides commentary on the proposed contracting framework to procure minimum inertia and the extent to which operational procurement of additional inertia can support a spot market, with consideration for desired outcomes, costs, benefits, and challenges.

## The role of grid-forming inverters and future estimates of synchronous condensers

### ***Long-term inertia needs are likely to involve a mixture of technologies, including grid-forming inverters***

ENGIE considers grid-forming inverters are likely to play a more prominent role in the long-term provision of inertia as part of a balanced mix of technologies that optimises costs and technical capabilities. ENGIE notes that the current technical and economic challenges inhibit the effective scaling of grid-forming inverters for deployment, with limited real-world experience with synthetic inertial responses at scale. ENGIE contends that advancements in measurement techniques, control systems, and operational experience are likely to enhance their contribution to system security in the long term to work in tandem with traditional inertia sources.

### ***Scaling grid-forming inertia requires favourable commercial outcomes***

ENGIE notes that barriers remain for market participants seeking to invest in emerging inertia technologies. For example, a major challenge in establishing a battery energy storage system as a grid-forming asset, rather than a grid-following one, is the lack of a commercial incentive. The primary drivers for enabling grid-forming mode have been support from state-based policies and Australian Renewable Energy Agency funding. While there are initial promising outcomes, it remains uncertain to what extent these programs will address the future minimum inertia requirements of the grid where market participants do not have access to a string inertia procurement market.

### ***Minimum inertia is likely to be met by synchronous condensers under current obligations; however, long-term contracts may discriminate against emerging inertia technologies***

ENGIE considers minimum inertia requirements in the short to medium term are likely to be met by synchronous condensers as Transmission Network Service Providers (TNSPs) meet obligations under the new system strength framework. This framework requires TNSPs to ensure that the inertia sub-network allocation or the secure inertia level for their region is made available annually at the least cost. These current requirements mean that obligations are likely to be met primarily through synchronous inertia or, with the Australian Energy Market Operator's (AEMO) approval, synthetic inertia.

In the long term, ENGIE contends that this scenario may discriminate against new technologies seeking to enter the market as procurement contracts are likely to be initially allocated to traditional synchronous inertia technologies. This issue may be partly addressed by ensuring appropriate contract lengths for the procurement of minimum inertia.

### ***A holistic market-based approach may be appropriate in future iterations of inertia provision***

ENGIE contends there is an opportunity to assess whether a staged market-based approach for the procurement of all inertia would deliver long-term benefits as emerging technology sources mature, thus removing some system strength framework obligations for TNSPs.

ENGIE contends this transition could be modelled on the evolution of the Frequency Control Ancillary Services markets, where market mechanisms were gradually introduced to enable broader participation and competition. A similar approach for inertia procurement may create a pathway for emerging technologies and allow the inertia market to evolve while maintaining system security.

### Procurement mechanism to meet minimum inertia levels

***A contracting framework may be suitable to meet minimum inertia levels, but lengths should align with expected technology development cycles***

ENGIE is largely supportive of using a contracting framework to meet minimum inertia requirements in the short to medium term as emerging technologies mature. ENGIE considers this approach provides participants with a predictable revenue stream to support investment in existing inertia-generating assets while minimising the risk of system disruptions or price spikes for consumers. ENGIE contends that procurement mechanisms should ensure contract timeframes align with expected technology development cycles to ensure that competitive pressure from emerging technologies is maintained in any future procurement rounds.

***Periods of low inertia may blur lines between contracted minimum inertia and operationalised additional inertia***

ENGIE notes that the HoustonKemp analysis does not account for fluctuations in synchronous generator availability across dispatch intervals or regions in the NEM, which could result in periods of low inertia requiring operational interventions to maintain system security. Consequently, in periods of low inertia, minimum and additional inertia boundaries may overlap. ENGIE seeks clarification on how long-term procurement contracts for minimum inertia will be structured to address periods of low inertia, as well as how AEMO will procure inertia when not met by contracts.

### Implementation considerations

***Further clarity is required to understand the uncertainties in the supply and demand of inertia***

ENGIE contends a greater understanding of the uncertainties in the supply and demand of inertia will provide a more robust foundation for enduring regulatory decisions that balance system security with market efficiency. For example, it would be beneficial to have more detailed information on TNSP investment plans for synchronous condensers.

Further clarity would enhance understanding of short-term and long-term supply dynamics to allow policy to be more effectively tailored to meet evolving market needs. Addressing these uncertainties would also likely increase market confidence, improve price discovery transparency, and strengthen the investment environment.

***Careful consideration should be given to the most effective policy design***

ENGIE supports efforts to provide policy certainty for market participants. It is equally important to ensure that policy design is effective and capable of delivering the best outcomes for the energy market and consumers. It may be prudent to allocate extra time to develop a well-designed market framework, allowing for the natural emergence of advancements in the understanding of the underlying physics and the evolving capabilities of technology regarding the demand and supply of inertia.

**Concluding remarks**

ENGIE looks forward to working actively with the AEMC to support the development of an ancillary service spot market for inertia in the NEM to ensure the secure and efficient operation of the power system through the energy transition.

Should you have any queries in relation to this submission please do not hesitate to contact me by telephone on [REDACTED]

Yours sincerely,

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**Ronan Cotter**  
Regulatory Advisor