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Australian Energy Market Commission

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National Electricity Amendment (Efficient provision of inertia) Rule 2025

AGL Energy (AGL) welcomes the opportunity to respond to the Australian Energy Market Commission (AEMC) National Electricity Amendment (Efficient Provision of inertia) Rule 2025 Directions Paper.

About AGL Energy

At AGL, we believe energy makes life better and are passionate about powering the way Australians live, move and work. Proudly Australian for more than 185 years, AGL supplies around 4.5 million[1] energy, telecommunications and Netflix customer services. AGL is committed to providing our customers simple, fair and accessible essential services as they decarbonise and electrify the way they live, work and move.

AGL operates Australia's largest private electricity generation portfolio within the National Electricity Market, comprising coal and gas-fired generation, renewable energy sources such as wind, hydro and solar, batteries and other firming technology, and storage assets. We are building on our history as one of Australia's leading private investors in renewable energy to now lead the business of transition to a lower emissions, affordable and smart energy future in line with the goals of our Climate Transition Action Plan. We'll continue to innovate in energy and other essential services to enhance the way Australians live, and to help preserve the world around us for future generations.

Overview

The current inertia framework, by which inertia is procured by TNSP contract only where a shortfall is predicted, and which does not explicitly value and procure the inertia required during normal operation, does not provide adequate incentive for providers of inertia to remain or enter the market.

Given the limitations of the current arrangements, AGL considers the best operational procurement model is a standalone inertia spot market over the reform of the existing 1-second FCAS market to incorporate inertia. By creating a dedicated market for inertia, this model is likely to provide a distinct and transparent price signal specifically for inertia. This ensures that the value of inertia is clearly recognised and incentivised, without being conflated with other services like fast frequency response (FFR). A dedicated market avoids adding complexity to the existing FCAS market structure, which already handles multiple ancillary services.

However, AGL acknowledges that reforms to the existing 1-second FCAS market to incorporate inertia may also result in improvements in comparison to the current arrangements provided it is designed and executed effectively. Therefore, AGL is open to considering this option further and providing inputs to help inform any detailed design work. We agree with the AEMC as noted in the Directions Paper that further research and development is necessary to address key considerations for its successful adoption.

Eligibility of inertia providers

The AEMC's Directions Paper has suggested that eligibility for participating in a spot market could mandate that all inertia providers must be able to provide inertia at 0 MW. AGL does not support this approach and considers it could have adverse unintended consequences. By limiting the eligibility of who can participate in an inertia spot market:

- The market may fail to adequately value inertia
- If existing units that currently providing inertia are not eligible, these units may leave the market, which would reduce inertia availability in specific load areas, potentially increasing costs relative to keeping units online.

Future credible contingency size in the NEM

The size of credible contingency events may shift in both directions, with the largest events becoming larger and the smallest becoming smaller. These changes could arise due to an increasing number of smaller capacity generators, where each failure could represent a minor but credible contingency event. Additionally, if multiple smaller generators depend on a single transmission line, its failure could escalate into a larger contingency event, as all connected generators would be unable to supply power to the grid. Additionally, forecast increased in the severity of weather events is likely to play into both of these scenarios. As a result, we expect that the volatility of credible contingency events may increase, occurring more frequently and varying in scale, with some being larger or smaller than what we currently experience.

Future estimates of synchronous condensers & role of grid forming inverters

Long-term trends suggest that, over the next decade, the number of synchronous generators in the grid is likely to decrease, while inverter-based renewable technologies are expected to grow.

When considering the conversion of the exiting assets, converting a retired thermal generator into a synchronous condenser may not always align with the long-term plans for the asset. For example, the generator may intend to redevelop the site for the construction of a renewable energy plant. Additionally, the conversion of thermal generators to synchronous condensers involves significant costs, and with global demand for such technologies on the rise, supply chain delays and cost increases could pose further challenges.

Also, while many synchronous generators are approaching the end of their operational life, there are also plans to establish new Gas-Powered electricity Generation (GPG) facilities. These developments could mitigate the reliance on synchronous condensers to satisfy the minimum inertia requirements of NEM.

As cost is a key factor, as we highlighted above, by defining inertia and determining the inertia requirements for the NEM, an approach that values inertia and provides incentives to provide inertia will encourage the right investments to be made at the least cost.

For example, this would encourage more grid forming inverter-based technologies over grid following technologies. This would allow for the provision of more synthetic inertia. While we acknowledge there are differences between synthetic inertia and synchronous inertia, if the market is designed to ensure the inertia requirements of the system are met, these differences should be able to be mitigated.

Future inertia supply and cost

While the AEMC has considered some of the estimated costs of inertia supply, including fixed, variable, and emissions costs, it should also account for the power consumption associated with different inertia supply options. For instance, synchronous condensers and battery storage systems, like other power generation or grid-support systems, are not entirely free of energy consumption. These systems can act as net loads.

Also, given the way the existing thermal generators are configured, auxiliaries such as oil and cooling systems will continue to operate following any conversion. These auxiliary systems act as sink converters. Sink converters refer to systems that absorb and utilise energy for their own operational requirements rather than transmitting it entirely for external use. In the context of auxiliary systems, a portion of power is required to sustain rotational motion and other essential functions, reducing the net energy available for external applications.

As a result, this inherent energy consumption contributes to operational variable costs, encompassing factors such as fuel usage, maintenance, and efficiency losses. Over time, these costs can extend the payback period—the time required to recover the initial investment. Higher energy consumption by auxiliary

systems increases operational expenditures, thereby delaying cost recovery and impacting the overall economic viability of the investment.

Procurement mechanisms to meet minimum inertia and other benefits of operational procurement

The introduction of an inertia spot market would be a key development for managing grid stability, and while it presents a learning curve, participation should not pose significant concerns. Additionally, we would note that the market is still assessing the modelling and valuation of additional services such as voltage support and reactive power. As the grid transitions to higher shares of renewable energy, these services are becoming increasingly critical for maintaining stability. Recent developments highlight a growing focus on their importance, underscoring the need for clear valuation and integration into market frameworks.

The Nelson Review aims to shape future market operations and is also considering the best means of incorporating essential system services to enhance market functionality. The integration of an inertia market must align with other system service procurements to ensure a coordinated approach. While TNSPs can recover costs and achieve economic returns on system service procurement, financial gaps remain for generators and other providers of inertia as there is no compensation framework in place. Existing reliance on last resort interventions by the market operator to maintain system security has been identified a key area of market reform, and providing the appropriate market signals and revenue streams is a critical step to managing this issue.

If you have queries re this submission, please contact Warren Vosper on wvosper@agl.com.au

Yours sincerely,

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