



AGL Energy Limited

T 02 9921 2999

F 02 9921 2552

agl.com.au

ABN: 74 115 061 375

Level 24, 200 George St

Sydney NSW 2000

Locked Bag 1837

St Leonards NSW 2065

James Hyatt
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

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Dear James,

EPR0076 Investigation into system strength frameworks in the NEM

AGL Energy (AGL) welcomes the opportunity to comment on the Australian Energy Market Commission (AEMC) investigation into system strength frameworks in the National Electricity Market (NEM) discussion paper.

We note that there are related reviews which may also impact the provision of system strength from the AEMC (including COGATI, the pending Hydro Tasmania synchronous services rule change request, and the pending TransGrid rule change proposal on system strength issues) and the Energy Security Board (the system security and post-2025 market design reviews). To avoid duplication and inconsistencies, we encourage the AEMC to ensure a coordinated response to system strength in these reviews and to also ensure that the outcomes are aligned with recently completed reviews, including the Integrated System Plan rules.

Issues with the current frameworks

AGL agrees with the AEMC assessment that the current system strength frameworks need to evolve.

We consider it important that this investigation assess the four frameworks for addressing system strength in the NEM:

- the minimum system strength framework, and the “do no harm” framework, which are designed to ensure sufficient investment in system strength; and
- NEMDE constraint equations invoked to address system strength, and system strength directions, which are designed to ensure there is sufficient system strength at dispatch.

The minimum system strength framework

AGL considers a centrally co-ordinated model for the provision of system strength (with a competitive procurement process for system strength remediation) may be the best model to ensure sufficient investment in system strength and is therefore supportive of further consideration of a revised model of AEMO and the TNSP’s responsibilities under the minimum system strength frameworks.

The three issues identified by the AEMC with the current minimum system strength framework represent opportunities for a more accurate accounting of system strength, the elimination of redundancy in the provision of system strength, and earlier identification of system strength shortfalls. AGL is supportive of changes which meet these objectives.

The “do no harm” framework

AGL believes the “do no harm” framework has been an inefficient framework for ensuring sufficient investment in system strength in the NEM. The uncertainty of cost and duration of connection, and challenges in coordinating approaches to address system strength, caused by the framework have been of particular concern as they have raised barriers to entry and stalled investment in the NEM.



NEMDE constraint equations invoked to address system strength

NEMDE constraint equations invoked to address system strength (the equations) are designed to ensure there is sufficient system strength at dispatch by limiting the output of inverter-based generators (such as wind and solar), since these generators can increase the need for system strength. These equations can lead to less output and therefore reduced compensation for inverter-based generators, and more output and therefore increased compensation for synchronous generators (although not necessarily from the same region). The equations therefore impact incentives for system strength investment, although the impact is limited since NEMDE cannot incentivise or compensate generators which are not online. AGL therefore requests that the AEMC assess the impact the equations have had on investment in system strength in the NEM and considers how the equations will integrate with any new proposed system strength framework.

System strength directions

AEMO's directions to synchronous generators to come online to ensure minimum system strength requirements are met are designed as a last resort mechanism to ensure sufficient system strength at dispatch. The directions have however been used frequently due to the 'unit commitment issue' – the requirement that certain combinations of synchronous generating units must be committed in advance to ensure there is sufficient system strength. The issue exists due to the inability for a market signal or AEMO intervention to adjust the real-time level of system strength provided by existing generators, due to the start-up times for synchronous generator units.

AGL considers the unit commitment issue to be one of the key challenges in designing a new framework for addressing system strength in the NEM. System strength directions are not suitable as an ongoing mechanism to resolve the issue since they are an inefficient market intervention which lead to generators operating when it may not be in their interest to do so and with compensation not determined by market forces (which can lead to perverse market incentives). We therefore encourage the AEMC, in assessing new system strength frameworks, to consider options for how the system strength directions might be evolved or replaced.

The need for system strength in the NEM

AGL agrees with the AEMC's assessment that opportunities to expand the NER definition should be explored, and that the definition should recognise active and passive system strength procurement. The ideal definition would facilitate a technological neutral approach to system strength remediation so that no specific technology is mandated. The definition should ensure that synchronous generators, synchronous condensers, network augmentation, batteries, tuning inverter-based technology and any other suitable technology will be included as acceptable remediation options in circumstances where they have the technical capability to resolve the identified issue.

New frameworks for system strength

Model 1: Centrally co-ordinated

AGL considers a centrally co-ordinated model for the provision of system strength services in the NEM with a competitive procurement process for system strength remediation (when a shortfall is identified) may be the best model to ensure sufficient investment in system strength in the NEM. We agree with AEMC's assessment that the centrally co-ordinated model allows for better co-optimisation, co-ordination, proactivity, and flexibility in the provision of system strength. We consider that these attributes are necessary given the complex modelling required to assess potential system strength shortfalls, and the localised lumpy nature of system strength services. We accept that this framework will need to operate together with a mechanism to resolve the unit commitment issue to ensure there is no risk of system strength shortfalls at dispatch.

To ensure accountability and to optimise the efficiency of the centrally co-ordinated model we recommend that the assessment of system strength levels in the NEM should be an ongoing transparent process with



timely notification of potential system strength shortfalls. Market participants should have access to AEMO's whole of system PSCAD model for system strength to the extent possible and be able to provide feedback. A more transparent process would make it easier for market participants to anticipate opportunities to provide system strength services and should also assist in ensuring that when AEMO determines a system strength shortfall the recommended remediation is proportionate and well-specified. If AEMO considers that a system strength shortfall will lead to a risk of compromised system security, AEMO should provide clear modelling which indicates how it has come to that conclusion.

Where a need for remediation is determined, we recommend a competitive procurement process as this is the mechanism most likely to lead to the most efficient lowest cost outcome. Ideally the procurement process would be technologically neutral, and therefore it would define the system strength shortfall without mandating the technology required to remedy it. We recommend that AEMO should ultimately be responsible for choosing which remediation solution offered in the competitive procurement process will best meet the system strength need, since a TNSP may be more likely to have a conflict of interest in assessing the appropriate solution (particularly as they may submit a tender in the process if a network solution is available). If, however, the AEMC determines that the TNSP must be responsible for choosing the remediation solution, we recommend that the TNSP be subject to AER oversight.

Model 2: Market-based

In assessing the suitability of a market-based model for the provision of system strength in the NEM, AGL recommends the AEMC give regard to how the NEMDE constraint equations invoked to address system strength already create limited incentives for system strength investment in the NEM, and ensures that any new model appropriately integrates with these equations. AGL also suggests the AEMC gives more consideration to the necessary attributes of an efficient market on a general basis (numerous competitors, low barriers to entry (including regulatory certainty), transparent demand and supply signals, etc) and considers whether these attributes could be achieved in a market-based model for system strength.

Model 3: Mandatory service

AGL does not favour a mandatory service model for the provision of system strength. While a mandatory service model may increase certainty of system strength requirements and lead to consistent provision of the mandated level of system strength, this approach has several drawbacks. First, it will have many of the similar issues of the "do no harm" framework, as the AEMC has noted. Second, consistent provision of system strength services is an inefficient and unnecessary requirement which would likely lead to over-investment in system strength services. Mandating a given level of system strength ignores the varying ability of different generator types to provide system strength, and the varying system strength needs in different areas of the NEM. High system strength areas with meshed networks or abundant synchronous generation are not likely to benefit from mandated levels of system strength. Third, it is not clear that using fault current as a metric for system strength will ensure that all the system strength requirements of the network will be met.

Model 4: Access standard

AGL does not favour an access standard model for the provision of system strength. An access standard model may contribute to more secure operation of the power system as it would ensure that all generators (to which the standard applies) would be able to operate stably in low system strength environments. However (consistent with our assessment of the mandatory service model) such a prescriptive approach would lead to over-investment in system strength services, by ignoring the varying ability of different generator types to provide system strength, and the varying system strength needs in different areas of the NEM.



If you have any queries about this submission, please contact Anton King on (03) 8633 6102 or aking6@agl.com.au.

Yours sincerely,

Chris Streets

Senior Manager Wholesale Markets Regulation