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15 May 2020

Mr James Hyatt  
Australian Energy Market Commission  
Level 15, 60 Castlereagh St  
Sydney NSW 2000  
**Submitted online to:** [www.aemc.gov.au](http://www.aemc.gov.au)

Dear James

**Submission: Consultation on discussion paper – Investigation into system strength frameworks in the NEM**

CS Energy welcomes the opportunity to provide a submission on the Australian Energy Market Commission (**AEMC**) consultation on the AEMC's discussion paper – Investigation into system strength frameworks in the NEM.

**About CS Energy**

CS Energy is a Queensland energy company that generates and sells electricity in the National Electricity Market (**NEM**). CS Energy owns and operates the Kogan Creek and Callide coal-fired power stations. CS Energy sells electricity into the NEM from these power stations, as well as electricity generated by other power stations that CS Energy holds the trading rights to.

CS Energy also operates a retail business, offering retail contracts to large commercial and industrial users in Queensland, and is part of the South-East Queensland retail market through our joint venture with Alinta Energy.

CS Energy is 100 percent owned by the Queensland government.

**General comments**

CS Energy strongly supports the AEMC initiative to produce the Discussion paper – Investigation into system strength frameworks in the NEM and enable stakeholder input. The timing of the review is critical as it coincides with other aligned work especially the Energy Security Board's (**ESB**) post 2025 Future Market Program including the Essential Services workstream.

It is important to acknowledge the current suite of active workstreams that include system strength and ensure a holistic approach is adopted to deliver effective and efficient outcomes with a primary focus on minimising costs to consumers. The ESB is proposing changes to the NER to streamline several planning processes, including the ISP and the

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regulatory investment test for transmission (**RIT-T**). While it is expected that these changes will permit proactive system strength remediation where appropriate<sup>1</sup>, it is imperative that the process is transparent to ensure that the outcome is in the best interest of the consumer.

CS Energy acknowledges the system strength phenomena and its criticality to maintaining power system security. However, system strength was not on the radar as it was progressively eroded with the ongoing connection of non-synchronous generation in the NEM, to the extent that system strength in South Australia reduced below what are now defined as minimum levels of system strength. These circumstances continued for a substantial period before the implementation of remediation actions. The reactive response to addressing the now identified system strength shortfall resulted in the current frameworks that were implemented in 2017 with the primary role allocated to the Network Service Providers (**NSP**) to address the current and forecast system strength shortfalls. The outcome has dampened the provision for a competitive environment enabling non NSP solutions to be included in the mix to address system strength shortfalls.

As the current fleet of synchronous generators progress to retirement arising from technical and/or economic considerations, it is an imperative that the review of the system strength framework acknowledges the value of system strength as provided by synchronous plant and its importance in the maintenance of secure power system operation.

CS Energy would view an appropriate system strength framework as one that:

- (a) delivers efficient and least cost outcomes across the operational and investment timeframes underpinned by robust planning and forecasting processes;
- (b) supports the ongoing transformation of the energy industry and the NEM including the ESB Post 2025 Future Market Program; and
- (c) provides adequate levels of system strength for required and expected power system operating conditions that only depends on market intervention through the utilisation of directions on an exception basis.

Our detailed comments on the AEMC's discussion paper – Investigation into system strength frameworks in the NEM are set out in the Attachment utilising the AEMC Stakeholder submission template.

Please contact us if you would like to discuss this submission further.

Yours sincerely



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<sup>1</sup> For further information, see: <http://www.coagenergycouncil.gov.au/publications/consultation-draft-isp-rules>

## ATTACHMENT

# Investigation into system strength frameworks in the NEM

## STAKEHOLDER SUBMISSION TEMPLATE

[The template below has been developed to enable stakeholders to provide their feedback on specific questions that the Commission is interested in due to the discussion paper. It is designed to assist stakeholders provide valuable input on those questions the Commission is interested in. However, it is not meant to restrict any other issues that stakeholders would like to provide feedback on.](#)

### SUBMITTER DETAILS

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### CHAPTER 2 – KEY ISSUES WITH THE CURRENT SYSTEM STRENGTH FRAMEWORKS

#### Section 2.3 – Key issues of the minimum system strength framework

1. Do stakeholders agree with the AEMC’s assessment of the issues of the minimum system strength framework?	CS Energy agrees with and supports the identified issues and where the framework needs to evolve. The value of system strength is viewed as pivotal. Unit commitment and associated certainty should be viewed in the context of Rule obligations imposed on Participants to ensure offers are made in good faith and are not false or misleading. Magnitude and definition of minimum system strength does not cater for non-credible contingencies and this is consistent with power system security guidelines. However, in the event of a reclassification of a non-credible contingency event as credible, it would be appropriate to have visibility of the system strength requirement and availability for a satisfactory operating state, system strength requirement for a secure operating state, and the surplus of additional headroom of system strength.
2. Have stakeholders identified any other significant issues as a result of the minimum system strength framework?	The framework must provide transparency and enable non NSP providers to compete and be incentivised to provide system strength services to deliver a least cost outcome.

	Accurate modelling and forecasting and the provision of an appropriate lead time to respond to identified shortfalls will be an ongoing challenge. AEMO will need to consult with Participants to ensure the development of a robust, transparent and agile process that provides adequate lead time that delivers a least cost outcome.
<b>Section 2.4 – Key issues of the “do no harm” framework</b>	
3. Do stakeholders agree with this assessment of the issues of "do no harm" framework?	CS Energy agrees with the AEMC assessment of the issues arising from the ‘do no harm’ framework. Experience to date provides enough learning to enable the development of a more effective approach that does not act as a barrier to investment or result in unfair imposition of costs to other parties. However, transparency is paramount to ensure that costs are not allocated to customers due to poor business case decisions.
4. Have stakeholders identified any other significant issues as a result of the "do no harm" framework?	While AEMC has referred to the prolonged delays, it is an imperative that the ‘do no harm’ framework reflects the current and future transformation of the power system that includes plant retirement and ongoing connection of non-synchronous plant and what should be reasonable timeframes.
<b>Section 2.7 – Conclusion</b>	
5. What are stakeholders views on the Commission's proposal to consider evolving the framework to a more integrated approach for system strength in the NEM?	CS Energy supports the AEMC proposal. CS Energy views ‘evolving’ as a living process that is agile and responsive to challenges arising from the ongoing transformation of the generation mix and the characteristics of the power system.

## CHAPTER 3 – CONSIDERATIONS FOR PROVISION OF SYSTEM STRENGTH

<b>Section 3.1 - What is system strength?</b>	
6. Do stakeholders agree with the Commission’s characterisation of system strength?	Yes. It provides an insight to the essential system service as provided by system strength.
7. Has the Commission set out all the necessary considerations for defining a system strength service? If not, what additional considerations could be included?	CS Energy agrees that it is opportune for the AEMC to review and redefine the system strength definitions, and as they apply to the mix of synchronous and asynchronous plant currently and forecast in the NEM. The system strength technical envelope definition should include the maximum and minimum system strength requirements. Prior to the emergence of the asynchronous renewable generators there were parts of the network that were adversely exposed due to high levels of fault current. Any characterisation of system strength must include fault level and voltage stability.
8. Do stakeholders consider the regulatory definition of system strength should be updated/changed? If not, why not? If so, how could this be done?	As stated in item 7 above, it is opportune for the AEMC to review and redefine the system strength definitions and as they apply to the mix of synchronous and asynchronous plant currently and forecast in the NEM. Clarity of definition and description for system strength should deliver clear investment signals and ensure the framework can accommodate new technology advancements that can provide system strength in the future.

9. Do stakeholders consider that the system strength definition should recognise active and passive system strength procurement? If not, why not? If so, how could this be done?	This should be incorporated in the evolving development of the system strength framework. The active and passive system strength components are already a feature of the power system and they will continue to feature in the evolving power system.
10. Do stakeholders agree that clarifying the NER system strength service definition is likely to contribute to more/broader options for the system strength provision?	Yes, as stated in item 8
11. Are there any additional sources of fault current in the NEM that can contribute to meeting system strength needs?	Possibly batteries
12. Are there any other technologies in the NEM that can contribute to meeting system strength needs that should be considered?	Thermal storage. Creative control systems utilising adaptive gain. Avoiding overly aggressive control responses. The system strength framework should be flexible to accommodate new and emerging technologies that can provide the required system strength requirements.
<b><u>Section 3.2 - Why is system strength needed?</u></b>	
13. Do stakeholders agree with why system strength is needed?	Yes. The understanding and need must be reflected in the system strength framework to enable the procurement of system strength and reduce the need for AEMO to intervene in the NEM and/or constrain generation due to system strength shortfalls.
14. Are there any additional reasons for why system strength is needed in a power system?	No
15. Do stakeholders agree with the characterisation of the impact of inverter-based generation on system strength?	Yes. However, the system strength framework should be flexible to accommodate new and emerging technologies that can provide the required system strength requirements particularly with advancements in grid forming inverter technology.
16. Are there any additional impacts on system strength that should be taken into account?	No
<b><u>Section 3.3 - The provision of system strength in the NEM</u></b>	
17. Do stakeholders agree that with the characterisation of system strength thresholds?	Yes. In addition, CS Energy refers to the response in item 15. AEMO should have visibility of system strength availability that exists above the essential levels in the event of unplanned network outages or other contingency events that results in a reduction of system strength. If required, this would enable AEMO to return the power system to a secure operating state post contingent without resorting to

	intervention in the market. This scenario would require modifications to the framework that captures the value of system strength and a corresponding procurement process.
18. Are there any additional thresholds or alternative characterisations that might be included in the investigation?	None identified.
<b><u>Section 3.4 - The provision of system strength in the NEM</u></b>	
19. Do stakeholders agree with the system strength attributes?	Yes. CS Energy notes the challenge in some instances of the localised attribute of the provision of system strength and associated challenges in procuring the service. Refer to response in item 2.
20. Are there any additional attributes of system strength that the Commission should be aware of?	None identified.

## **CHAPTER 4 – EVOLVING SYSTEM STRENGTH FRAMEWORKS**

### **Section 4.1 - Approach to developing a new framework**

21. Do stakeholders agree with approach (Plan, Procure, Price, Pay) to developing a new framework for system strength? Are there additional steps/concepts that should be explored?	Agree and that a key deliverable be the least cost option for consumers.
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### **Section 4.2 - Models for delivering system strength**

22. Do stakeholders agree with the summary of the potential capabilities of each system strength model in Table 4.1?	Yes.
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### **Section 4.3 - Model 1: Centrally Coordinated**

23. Do stakeholders agree with the characterisation and assessment of a centrally coordinated model? Are there any other advantages and/or challenges?	Yes. The table content represents a spectrum and while there is volatility and uncertainty in the market policy and regulatory environment CS Energy would support the centralised coordinated approach.
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### **Section 4.4 - Model 2: Market based decentralised**

24. Do stakeholders agree with the characterisation and assessment of a market based decentralised model? Are there any other advantages and/or challenges?	Yes. This is the preferred CS Energy option. The tabled content represents a spectrum and as the volatility and uncertainty in the market policy and regulatory environment stabilises following implementation of key workstreams in the ESB Post 2025 Future Market Program, CS Energy would support the market-based de-centralised approach.
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### **Section 4.5 - Model 3: Mandatory service provision**

25. Do stakeholders agree with the characterisation and assessment of a mandatory service provision model? Are there any other advantages and/or challenges?	CS Energy agrees with the characterisation and assessment of a mandatory service provision model. However, it is not a preferred CS Energy option. CS Energy has concerns that the costs incurred will not deliver the least cost option for consumers.
<b>Section 4.6 - Model 4: Access standard</b>	
26. Do stakeholders agree with the characterisation and assessment of an access standard model? Are there any other advantages and/or challenges?	CS Energy agrees with the characterisation and assessment of an access standard model. However, it is not a preferred CS Energy option. CS Energy has concerns that the costs incurred will not deliver the least cost option for consumers.
<b>Chapter 4 - General</b>	
27. Are there other model(s) stakeholders think should be explored?	CS Energy notes the Hydro Tasmania proposed Synchronous Services Market rule change that should be incorporated into this process.
28. What combinations of models (i.e. hybrids) should be explored further?	Refer to response in items 23 and 24.
29. Do stakeholders have any suggestions as to how any/all the models set out could be implemented or modified? Please comment on any and all models possible.	Refer to response in items 17, 23 and 24.

## **CHAPTER 5 – SYSTEM STRENGTH IN DISTRIBUTION NETWORKS**

30. What factors make system strength provision in distribution networks unique from transmission networks?	The physical location and amount of rooftop solar PV is a feature of the distribution network while large scale solar farms generally connect to the sub- transmission and transmission network. However, the power system incorporates both the distribution and transmission networks and it is difficult to accept that similar system strength challenges have not emerged or will emerge that mirror the current system strength challenges on the transmission network.
31. What are the key issues for system strength in distribution networks, including the magnitude and urgency of system strength issues in distribution networks?	CS Energy would expect modelling the distribution system, generation, DER and passive system strength to be extremely challenging.
32. How should any system strength issues in distribution networks be addressed? Are any model(s) from Chapter 4 appropriate to address system strength provision in distribution networks?	CS Energy would expect higher levels of passive system strength procurement.