



31 October 2019

Mr John Pierce AO  
Chairman  
Australian Energy Market Commission

Lodged via AEMC website

Dear Mr Pierce,

**PROJECT ERC0274: Mandatory primary frequency response**  
**PROJECT ERC0263: Removal of disincentives to primary frequency response**  
**PROJECT ERC0277: Primary frequency response requirements**

The Clean Energy Council (CEC) is the peak body for the clean energy industry in Australia. We represent and work with hundreds of leading businesses operating in renewable energy and energy storage along with more than 6,000 solar and battery installers. We are committed to accelerating the transformation of Australia's energy system to one that is smarter and cleaner.

The CEC welcomes the opportunity to provide comment on two rule change proposals lodged by the Australian Energy Market Operator (AEMO) and the rule change proposal lodged by Dr Peter Sokolowski from RMIT University relating to the primary control of frequency in the National Electricity Market (NEM). Australia's energy system is rapidly transitioning away from large synchronous generation towards renewable asynchronous generation. This presents AEMO with a challenge in managing the supply and demand balance in the electricity system which can lead to frequency deviations.

In the past, normal operating frequency deviations have been controlled through voluntary primary frequency response (PFR) from large synchronous generators in the NEM. The current Frequency Control Ancillary Services (FCAS) framework does not require primary frequency response to be provided and therefore synchronous generators have detuned their machines to provide less voluntary PFR balancing any causer pays exposure. Some generators have also cited concerns around non-compliance with dispatch targets and the lack of clarity that the rules provide on this. This has impacted AEMO's ability to control frequency within the normal operating frequency band.

Through the Australian Energy Market Commission (AEMC) Frequency Control Frameworks Review (FCFR) we note that AEMO advised that there was no immediate need to implement

regulatory change to address the deterioration in normal operating frequency<sup>1</sup>. Through the review process AEMO also noted that although there was no immediate need for regulatory change, there is a need to find a more permanent solution to the issue. The CEC was supportive of this approach through the FCFR, however the system has continued to rapidly transition. We note the AEMO 25 August separation event has been used as evidence for the proposed change and the report states there is now an immediate need for an interim PFR mechanism to improve primary frequency control at both new and existing NEM connection points<sup>2</sup>.

The CEC respects that AEMO's primary responsibility is system security and reliability and that the intent of the rule change proposals is to address AEMO's immediate concerns. The current proposed mandatory PFR requirements by AEMO may be technically workable for the industry, however we suggest that it is inefficient to require the entire generation fleet to meet PFR requirements when a more targeted method such as direct contracting may be more cost effective in restoring frequency control in the interim. This type of approach would also recognise the generators who are best placed to respond to local frequency deviations at lowest cost.

We believe creating an interim mandatory PFR requirement on all generators may not complement the need to transition to a long-term option presented through the FCFR. The CEC is concerned that a mandatory requirement will delay the implementation of a long-term framework for PFR. We note that the proposed rule changes do not include an end date for the mandatory requirement or any discussion on transitional measures to a long-term framework for PFR. We are concerned that implementing a mandatory requirement on industry will be relied upon for frequency control longer than intended as future frameworks are developed.

The clean energy industry supports the FCFR recommendations for the establishment of market-based options as the long-term PFR framework that will recognise the quality (speed and accuracy) of new technologies, such as batteries, can provide as a PFR service. In the interim, an alternative approach such as a direct contracting model could be an effective first step towards a full market-based framework, it would provide the incentives to ensure the long-term market-based framework development is brought forward as fast as practically possible.

The CEC supports both rule change proposals that seek to remove perceived disincentives to providing PFR in the NEM, particularly to clarify that responding to frequency deviations will not be considered as non-conformance with dispatch targets. The outlined changes will remove any disincentives, perceived or real, to generators voluntarily providing primary frequency control to locally detected frequency deviations. This may contribute to improving the continued decline in frequency performance outside the normal operating frequency band in the NEM.

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<sup>1</sup> AEMC, Frequency control frameworks review, 26 July 2018, p iii, available at <https://www.aemc.gov.au/sites/default/files/2018-07/Final%20report.pdf>

<sup>2</sup> AEMO, Final Report – Queensland and South Australia system separation on 25 August 2018, 10 January 2019, p 8, available at [https://www.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](https://www.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)

In the attachment below we outline our comments relating to the proposed rule change requests, including the technical requirements of the AEMO proposed frequency response requirements, comments regarding the success of an interim PFR mechanism and the long-term need for a market-based approach to PFR in the NEM.

The CEC appreciates the opportunity to nominate our members to participate in the PFR rule change requests technical working group. This will give our members a valuable opportunity to add to the technical discussion as these rule changes are progressed.

Thank you for the opportunity to comment on this consultation. If you would like to discuss any of the issues raised in this submission, please contact Tom Parkinson, Policy Officer, on (03) 9929 4156 or [tparkinson@cleanenergycouncil.org.au](mailto:tparkinson@cleanenergycouncil.org.au) or myself, as outlined below.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Lillian Patterson', written in a cursive style.

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## **AEMO and Dr Sokolowski rule change proposals**

Broadly, the proposed technical requirements within AEMO's rule change request for mandatory primary frequency control are achievable by the majority of new renewable generators entering the NEM. We note however that mandating a response from all generators will fail to capture the least cost provision of PFR and may not represent the most cost-efficient interim solution. It is important that generators who face significant upgrade costs or are physically unable to meet the requirement are not penalised through increased causer pays factors or in other ways.

An integral component of the proposed change is for generators to maintain conformance with their dispatch targets while responding to local frequency deviations. Operating in a frequency response mode will mean generators will need to fluctuate away from dispatch instructions to arrest locally detected frequency deviations.

The two mandatory PFR rule change requests from AEMO and Dr Sokolowski present  $\pm 0.015\text{Hz}$  and  $\pm 0.025\text{Hz}$  respectively as the two options for generator deadband limits. The CEC suggests the proposed deadband of  $\pm 0.025\text{Hz}$  by Dr Sokolowski is more reasonable as a tighter deadband may increase the wear and tear on generating units such as wind turbines as they work to control their active power output.

To achieve the proposed AEMO technical requirements set out in the primary frequency response requirements document, older generators may face some upgrade costs that are dependent on their generator control system settings. For example, a modern solar farm will usually be able to provide lower services at most times and raise services if the generator is constrained or operating below their nominal output. An older generator may not be able to provide any frequency response at all, even if curtailed, without significant upgrades which may involve significant cost. If implemented, the CEC support the intention for generators to be able to recover their upgrade costs for meeting this requirement, although we again note that this may not be the most cost-efficient method for providing PFR in the NEM.

The CEC supports exemptions for generators that are unable to meet the requirements to provide mandatory PFR without significant upgrade costs. Further details are needed from AEMO on what would constitute 'significant augmentation' so generators can appropriately assess if they would be exempt<sup>3</sup>. We also suggest the AEMC consider the inclusion of these exemption provisions within the NER.

Similarly, we suggest further detail is developed and made available so industry is able to understand how the decision to not require headroom to provide raise services will be applied. This is particularly important for solar generators who need to ensure this exclusion will protect their right to generate at full capacity and as such only provide lower services in this instance.

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<sup>3</sup> AEMO, Primary frequency response requirements, August 2019, available at <https://www.aemc.gov.au/sites/default/files/2019-10/AEMO%20-%20Primary%20frequency%20response%20requirements%20V1.1%20-%20markup.PDF>

## Implementation of an interim framework

The CEC recognise that the mandatory PFR rule change proposals have been lodged with the intention to be an interim requirement in response to an increase in frequency deviations in the NEM. We are supportive of a mechanism for AEMO to improve frequency deviations in the interim and of the development of a permanent market-based solution to support the changing generation mix.

The AEMO 25 August separation event final report recommends that a permanent PFR solution should be developed and progressed to the implementation stage by mid-2020<sup>4</sup>. Even with the assumption this timeline may not be met, it suggests the interim arrangements implemented for PFR in the NEM will not be relied on for a long period before a long-term market or incentive-based mechanism is established. This suggests an interim solution that has a sunset date (or similar), is easy to implement, is low cost, utilises those generators that are best placed to provide PFR and supports the transition to a new PFR market would be the suitable option.

The CEC suggest the AEMC consider how the intention for the chosen PFR mechanism to act as an interim measure is recognised in any final rule decision. It is important that an interim solution is constructed appropriately in the NER, with provisions in place so it is not relied on as a long-term measure. This could include an end date for the requirement, or at minimum a review date to revisit the need for the interim solution and ensure it is still fit for purpose.

The AEMC should also consider the ability for an interim PFR framework to efficiently transition to a long-term market based PFR framework. We consider a mandatory requirement for PFR from all generators will be an inefficient transition to a market-based framework, as there will be no incentive for the highest quality primary frequency control (speed and accuracy of response) to provide the service first. An alternative approach to interim PFR such as direct contracting with generators who are best placed to provide this solution would provide the interim steps and signals to inform the development of a market-based framework.

As an interim solution, mandating PFR will not provide the most cost effective or quickest relief to frequency deviations outside the normal operating band in the NEM. Some generators will require substantial upgrades to meet the proposed technical requirements, with AEMO proposing these costs will be recovered from participant fees. Direct contracts with generators who are best placed and appropriately located to provide PFR can be implemented quickly and will ensure the generators who can provide PFR at least-cost to the system, without requiring costly upgrades, are utilised in the first instance.

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<sup>4</sup> AEMO, Final Report – Queensland and South Australia system separation on 25 August 2018, 10 January 2019, p 8, available at [https://www.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](https://www.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)

## Long-term market based PFR framework

The CEC supports the development of a permanent market-based mechanism to secure adequate PFR in the NEM. We suggest the AEMC should fast track the work that must happen to implement a long-term market based PFR framework. We note the second AEMO recommendation relating to PFR from their Final Report – Queensland and South Australia system separation on 25 August 2018 states;

*AEMO to support work on a permanent mechanism to secure adequate PFC as contemplated in the AEMC's Frequency Control Framework Review, with the aim of identifying any required rule changes to be submitted to the AEMC by the end of Q3 2019 with a detailed solution and implementation process completed by mid-2020.<sup>5</sup>*

The CEC supports this recommendation and suggests that work begins immediately in consultation with industry, alongside the development of these rule change requests, so that to the degree possible, both frameworks are designed appropriately so that the interim mechanism supports the long-term market design.

Establishing a market mechanism for PFR will allow competition to take place between generating technologies (current and future). It will also support the least cost provision of primary frequency control services in the same manner that the FCAS markets support contingency frequency control at least cost. We support a market mechanism that rewards PFR performance based on speed and accuracy as this would improve the efficiency of current frequency control arrangements and ensure that new technologies, such as batteries, that can provide fast and accurate response are encouraged to enter the market.

The CEC suggest that there is the need for quantitative modelling that will assist both this rule change process and the permanent PFR market development. If the level of frequency control needed from the generation fleet now and in the future is quantified, it will provide the AEMC with significant guidance on both the interim and the long-term PFR mechanism. If quantitative modelling suggests that frequency stability can be restored through a level of PFR that does not involve mandating a response from the entire generation fleet, that will further support an alternative approach to interim mandated PFR.

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<sup>5</sup> AEMO, Final Report – Queensland and South Australia system separation on 25 August 2018, 10 January 2019, p 8, available at [https://www.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](https://www.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)