5 February 2021

Anna Collyer
Chair
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Submitted online: www.aemc.gov.au

Dear Ms Collyer

Frequency control rule changes – Directions Paper

Origin Energy Limited (Origin) welcomes the opportunity to provide comments on the Australian Energy Market Commission's (AEMC) Frequency control rule changes Directions Paper. Our views on key aspects of the Directions Paper are noted below and further details can be found in Attachment 1.

Fast frequency response

- The role of fast acting frequency control services in the NEM is likely to become more important over time to manage high rate of change of frequency (RoCoF) events. However, there does not appear to be an immediate need to implement alternate market/pricing arrangements FFR in the near term. An adequate first step toward integrating FFR would be to revise the Market Ancillary Service Specification (MASS) to allow procurement of the service through the existing fast contingency frequency control ancillary services (FCAS) markets.

- If it is ultimately determined there are additional benefits associated with FFR that cannot be adequately valued through the fast contingency FCAS markets, introducing two new contingency FCAS categories would likely provide an efficient and transparent approach to explicitly valuing the service over the longer-term.

- Co-optimisation of inertia and FFR service provision can lower the cost of managing system RoCoF. The case for implementing separate FFR markets in the near term may therefore be improved if the framework could be designed to procure and remunerate both inertial response (natural and synthetic) and fast acting services under the MASS.

- Incorporating the use of 'demand curves' to value the costs/benefits of FCAS service provision and allow for procurement above minimum required levels is not an immediate priority. While demand curves can theoretically facilitate more efficient market outcomes, they are inherently reliant on administratively determined assessments of 'value' and can lead to over-procurement and higher costs for consumers for no material benefit.

Primary Frequency Response

- Origin is strongly supportive of transitioning to an incentive-based framework for procuring PFR to manage frequency within the Normal Operating Frequency Band (NOFB) from June 2023 and removing the existing mandatory requirement.

- Of the options proposed in the Directions Paper to incentivise narrow-band PFR service provision, introducing a new voluntary narrow-band PFR service that operates as per existing FCAS markets would likely be the most appropriate solution. However, the AEMC should also consider whether the existing fast contingency FCAS service could be leveraged to procure sufficient narrow-band PFR on an enduring basis. The key advantage of this approach is that it would avoid splitting responsive capacity across multiple markets, which may facilitate more stable and predictable price outcomes for ancillary service providers.

- Establishing an effective market-based framework for procuring narrow-band PFR would remove the need to retain a mandatory requirement as a tool for managing frequency within the NOFB or generation event containment band. If a mandatory wide deadband requirement is to be retained as a safety net to manage significant non-credible contingency events, the AEMC should clearly demonstrate this would provide a more economically efficient solution than relying on other emergency frequency control schemes.

Frequency operating standard

- Changes to the FOS will be required to guide the procurement approach for PFR, noting the FOS only specifies the boundaries of the NOFB, not how frequency needs to be managed within the NOFB. The FOS also has a potential role to play in developing a RoCoF standard that could be used to guide the procurement of FFR/inertia volumes. In the absence of this guidance, it is difficult to evaluate the overall costs/benefits that could be derived from different frequency control reform options. A review of the FOS should therefore occur prior to the AEMC finalising its position on changes to the frequency control framework, rather than after the consultation process has concluded as currently proposed.

If you wish to discuss any aspect of this submission further, please contact Shaun Cole at shaun.cole@originenergy.com.au or on 03 8665 7366.

Yours Sincerely,

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1. Fast frequency response market ancillary service

1.1 The case for establishing new market/pricing arrangements for FFR in the near term requires further consideration

Origin agrees the role of fast acting frequency control services (i.e. sub 2s) in the NEM is likely to become more important over time, given these services can assist with managing high RoCoF events and operating the power system at lower levels of inertia. It is appropriate therefore, to examine whether the existing FCAS framework will adequately incentivise the provision of faster acting services over time to support future power system operation. To this end, Origin considers the benefits of establishing new arrangements to value/procure FFR in the near term will likely be dependent on a broader range of factors than is currently considered in section 4.5 of the Directions Paper. Key issues that should be considered by the AEMC in this respect include:

- The extent to which the service could be competitively procured: At present, a narrow response time (e.g. within 2s) would limit the pool of potential providers. This may increase the cost of FFR service provision in the event separate market arrangements for FFR are introduced due to limited competition in service provision.

- The extent to which the existing framework may undervalue or even preclude the provision of faster acting services: While the existing framework does not explicitly value the provision of FFR, AEMO does have the ability to differentially value individual plant through the FCAS registration process, with faster responding providers being valued for more MW of response. AEMO is also yet to complete its review of the MASS, which the AEMC recommended should consider whether there are any unnecessary barriers to new entrants, or aspects of the MASS that may not allow for appropriate valuation of services provided by newer technologies.[1] Should the existing fast contingency service be capable of accommodating increased participation of faster acting technologies (e.g. batteries), Figure 4.4 demonstrates the cost of the fast raise service, as well as the need for an explicit FFR mechanism, would likely reduce.

- The broader framework for procuring inertia: The primary role of an FFR service would be to manage RoCoF during periods of low inertia, with Figure 4.4 of the Directions Paper demonstrating the expected value of faster acting services increases as the level of system inertia declines. AEMO's 2020 Integrated System Plan (ISP) forecasts show that mainland levels of inertia are not expected to materially reduce until around 2030 under the central scenario. The introduction of new arrangements to incentivise the ongoing provision of inertia (as is currently being considered by the ESB) will also directly impact the level of inertia that is ultimately made available.

- The overarching frequency operating standard (FOS): It is difficult to evaluate the enhanced system value that may be associated with faster response without first establishing an appropriate standard upon which to base performance. Consideration should therefore be given to whether the FOS is adequately defined to facilitate efficient procurement of FCAS and other ancillary services to meet future operational needs, including the management of RoCoF.

In light of the the above factors, Origin does not consider there is a material need to implement new arrangements for FFR in the near term. If technically feasible, revising the MASS to allow procurement of FFR through the existing six second fast contingency service may therefore provide an adequate first step toward incentivising provision of the new service ahead of implementing alternate market/pricing arrangements in the future.

[1] AEMC, *Frequency control frameworks review*, 26 July 2018, pg. xii.

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1.2 Separate market arrangement for FFR may provide a more enduring longer-term solution

It may be determined there are additional benefits associated with FFR that cannot be adequately valued through the fast contingency markets based on future changes in system operation and the expected role of FFR. If so, Origin suggests the introduction of two new contingency FCAS categories (i.e. Option 1) would likely provide an efficient and transparent approach to explicitly valuing the service over the longer-term. The two new FFR markets could be designed to operate on the same basis as existing contingency FCAS markets to facilitate a competitive approach to procurement/pricing of the service. Maintaining consistency with existing FCAS categories (including with respect to cost allocation) would also reduce any complexity for providers that may be operating across multiple market categories.

Origin is not supportive of using performance-based price multipliers to produce differential pricing of FFR within the existing fast contingency markets (i.e. Option 2). Such an approach would increase complexity and potentially distort efficient market outcomes, since it may result in FFR services being under/overvalued. It is also not clear how the use of performance-based price multipliers would be advantageous relative to the existing framework that allows faster service providers to be apportioned a greater volume of response through the registration process, and therefore additional value.

1.3 A procurement approach that allows for bundling of FFR and inertia should be considered

As noted by the AEMC in its Final Determination on Managing the Rate of Change of Power System Frequency, co-optimisation of inertia and FFR service provision can lower the cost of managing system RoCoF. FFR is also not a perfect substitute for inertia, meaning a minimum quantity of synchronous inertia will continue to be required over the medium term. It is essential therefore that reforms to facilitate FFR are not progressed in isolation of measures to value inertia.

The Directions Paper also notes it is not envisaged that a complete arrangement for the valuation of inertia will be developed and implemented through the FFR rule change process. This is largely because consideration of a market arrangement for inertia is complex given interdependencies with other essential system services such as system strength. However, we consider the case for implementing an FFR market in the near term may be improved if the framework could be designed to procure and remunerate both inertial response (natural and synthetic) and fast acting services under the MASS.

If technically feasible, this approach would establish a framework for incentivising investment in faster acting frequency control services that are expected to be needed in the future. More importantly, it would provide an initial step toward establishing a real-time market for inertia service provision (if needed), with the FFR market likely to be mostly supplied with natural inertial response, at least initially. This would likely reduce reliance on out-of-market contracting for inertia, since synchronous generators would have greater financial incentive to remain self-committed during low inertia periods, potentially even when energy prices are low. A transitional path toward splitting out inertia service provision into a stand-alone real-time spot market could also be established, noting the ESB is currently considering how such a market could be designed.

1.4 Incorporating the use of ‘demand curves’ to value the costs/benefits of service provision is not an immediate priority

A framework that allows for the procurement of contingency FCAS services beyond minimum levels based on an economic assessment of costs/benefits (i.e. demand curves) could theoretically facilitate more efficient market outcomes. However, there are inherent challenges associated with applying such frameworks in practice, given they rely on administratively determined assessments of ‘value’ for consumers. Where an overly conservative view is taken, this can lead to over-procurement and higher costs for consumers for no material benefit. Origin is therefore supportive of retaining the current deterministic approach whereby AEMO procures the minimum volume of FCAS services required to satisfy the FOS.

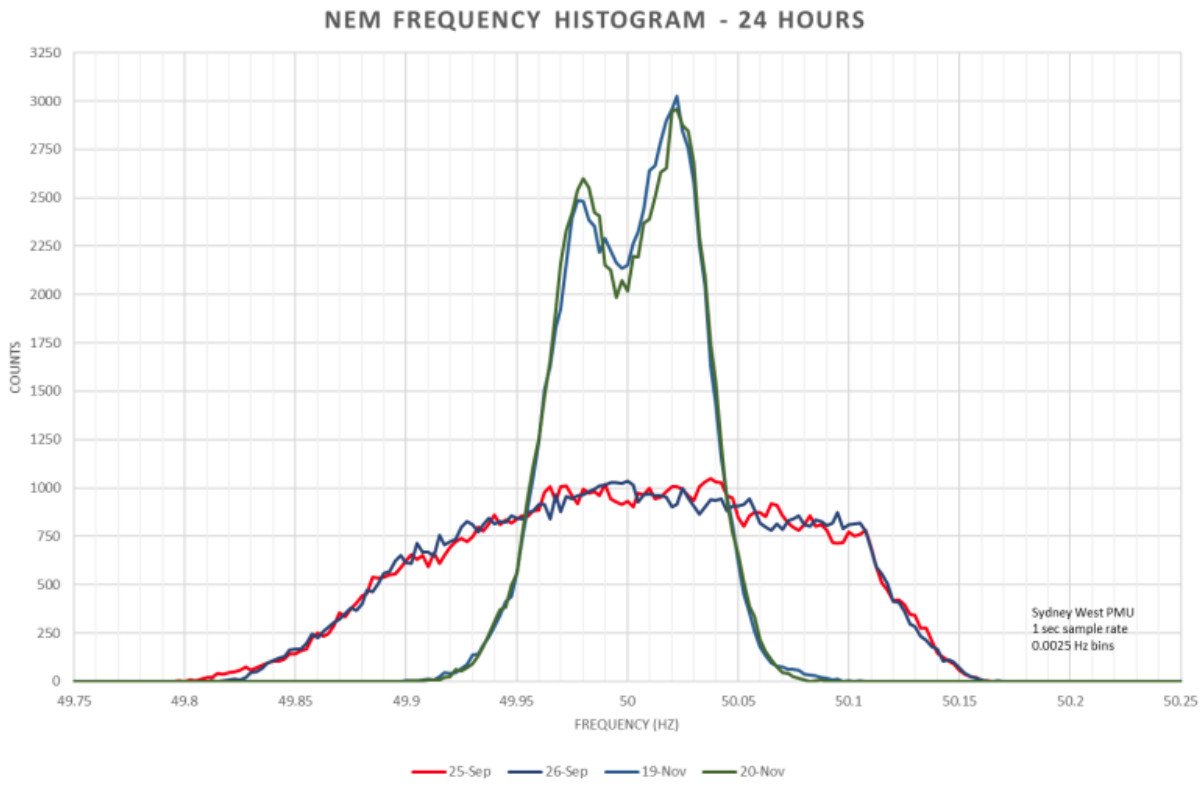
2. Primary frequency response incentive arrangements

2.1 The mandatory PFR requirement is not an enduring solution

As identified by the AEMC, there is a range of fundamental limitations with the existing mandatory PFR requirement. The current framework imposes costs on all generators and fails to balance those costs with overall system security benefits. It also provides no incentive for new entrants to invest in PFR and potentially reduces the value of existing contingency services. This could have the unintended consequence of signalling to participants that frequency response is less valued by the market, leading to a lack of investment in FCAS capability more broadly.

The inefficiency associated with the requirement is evident in the initial observations of frequency performance following enablement of the first tranche of generators under the rule. As at 20 November 2020, only 21.7 GW of generation capacity had implemented the required setting changes out of the total 58.1 GW captured by the mandatory requirement. As shown in Chart 1 below, there was a material improvement in frequency distribution over this period, with frequency remaining closer to 50 Hz. This demonstrates there is likely to be diminishing gains in requiring all generators to provide the service (including those not well placed to do so) on an enduring basis.

Chart 1: Distribution of NEM Frequency[2]



2.2 Transitioning to a market-based approach for procuring PFR is crucial

[2] AEMO, *Implementation of PFR rule – Update Nov 2020*, slide 5.

Origin is strongly supportive of transitioning to an incentive-based framework for procuring PFR to manage frequency within the NOFB from June 2023 and removing the existing mandatory requirement. Two key issues to be resolved in this respect based on the development pathways set out by the AEMC are: the framework that should be applied to incentivise PFR service provision; and whether there is an ongoing role for some form of mandatory requirement to apply as a safety net to protect against significant non-credible contingencies. These issues are discussed further below.

2.2.1 Incentivising PFR service provision

Of the options proposed in the Directions Paper to incentivise narrow-band PFR service provision, establishing a new voluntary narrow-band PFR service would likely be the most appropriate solution. The service could operate on an equivalent basis to existing FCAS markets from a procurement, pricing and cost allocation perspective, but seek to maintain frequency more tightly around 50Hz. Such an approach is likely to be less complex than implementing a double-sided causer pays framework, noting the feasibility of that framework requires more detailed consideration. A new PFR service would also facilitate more efficient market outcomes for consumers than an approach that relies on regulated payments to service providers, given the risk of regulated payments under/over valuing service provision.

An alternate option that should also be considered by the AEMC is whether the existing fast contingency FCAS service could be leveraged to procure sufficient narrow-band PFR on an enduring basis. Recent changes to the MASS have allowed PFR provided by contingency FCAS enabled plant within the NOFB to be recognised as response (i.e. remunerated). Retaining this change would reduce any incentive for enabled capacity providers to relax generator settings and only provide PFR when frequency exits the NOFB following the removal of the current mandatory requirement. However, if there are residual concerns this could still occur, the MASS could be augmented to explicitly require fast contingency FCAS response to be initiated before frequency exits the NOFB. The application of a price floor could also be considered with a view to providing certainty that a minimum level of PFR would always be made available, noting a price floor would incentivise generating units to stay online for longer periods and start-up earlier in advance of expected volatility.

Consistent with our views on enabling FFR service provision within the fast contingency service (at least initially), the key advantage of this approach is that it would avoid splitting responsive capacity across multiple markets. This would likely lead to more stable and predictable price outcomes for ancillary service providers and increase the pool of providers available to respond to price volatility. It is also consistent with AEMO's justification for amending the MASS as described above, namely that any PFR provided by an enabled contingency FCAS generating unit acts to contain a frequency deviation and should therefore be recognised as contingency response.[3]

2.2.2 The role a mandatory requirement

Establishing an effective market-based framework for procuring PFR (as discussed above) would remove the need to retain a mandatory requirement as tool for managing frequency within the NOFB or generation event containment band. We are therefore strongly opposed to retaining any form of mandatory narrow/moderate dead-band requirement.

If the AEMC remains of the view that some form of mandatory requirement should be retained as a safety net to protect against significant non-credible contingency events, we generally agree that moving to a wide deadband setting would assist with reducing the cost and distortionary impact of the mandatory requirement on existing markets. However, if a mandatory wide deadband requirement is to be retained,

[3] AEMO, *'Market Ancillary Service Specification and Causer Pays Procedure – Draft Determination'*, February 2020, pg. 3.

the AMEC should clearly demonstrate the requirement provides a more economically efficient solution to managing significant non-credible contingency events than other emergency frequency control schemes designed for that purpose.

2.3 Additional reforms relating the cost allocation for regulation service

As noted in the Directions Paper, the AEMC is currently considering a number of additional reforms relating to the cost allocation for regulation services. Our views on aspects of these changes are provided below.

- Measurement of plant performance: Further analysis is required to understand the overall benefits that would be derived from measuring plant performance with respect to system frequency rather than the frequency indicator (FI). While conceptually the proposed change would improve economic incentives to control power system frequency, it is not clear based on the current discussion whether the use of the FI indicator is giving rise to materially inefficiencies.

- Sample and application periods: Reducing the 28-day average period for the calculation of contribution factors may result in more volatile causer pay's factors for market participants. In evaluating the case for reducing the sampling period, the AEMC may therefore need to balance the objectives of improving cost-reflectivity and providing market participants with adequate certainty to manage their exposure.

- Calculation of local contribution requirements for local FCAS requirements: Origin agrees it is not appropriate for a market participant's plant in one NEM region to be allocated costs for a local requirement for regulation services in another region. We are therefore supportive of developing local contribution factors for each NEM region to more accurately apportion regional FCAS costs.

- Allocation of costs to non-metered generation: Origin is generally supportive of allocating residual costs on a proportional basis to non-metered generation/load to correct the oversight identified with the existing causer pay's framework that exempts that category of market participants from any cost liability.

3. The frequency operating standard

Changes to the FOS will be required to guide the procurement approach for PFR, noting the FOS only specifies the boundaries of the NOFB, not how frequency needs to be managed within the NOFB. As discussed above, we also consider the FOS has a potential role to play in developing a RoCoF standard that could be used to guide the procurement of FFR/inertia volumes. In the absence of this guidance, it is difficult to evaluate the overall costs/benefits that could be derived from different reform options. A review of the FOS should therefore occur prior to the AEMC finalising its position on changes to the frequency control framework, rather than after the consultation process has concluded as currently proposed.