

Australian Energy Market Commission
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ERC0263 – Primary Frequency Response Incentive Arrangements

The Australian Energy Council (AEC) welcomes the opportunity to make a submission to the Primary Frequency Response Incentives Arrangements Directions Paper.

The Australian Energy Council is the peak industry body for electricity and downstream natural gas businesses operating in the competitive wholesale and retail energy markets. AEC members generate and sell energy to over 10 million homes and businesses and are major investors in renewable energy generation. The AEC supports reaching net-zero by 2050 as well as a 55 per cent emissions reduction target by 2035 and is committed to delivering the energy transition for the benefit of consumers.

Background, Scope and Assessment Framework

The AEC submitted to the September 2021 Draft Determination its disappointment that AEMC had recommended an enduring obligation upon scheduled and semi-scheduled units to provide narrow band Primary Frequency Response (PFR).

The AEC however welcomed the AEMC's early efforts to incorporate an incentive arrangement to at least provide a form of compensation that might encourage ongoing investment in PFR, noting that in the presence of an obligation to supply, any incentive arrangement was likely to be:

- Distorted, i.e. an efficient price was unlikely to emerge in the presence of mandatory supply; and
- Inefficient compared to a voluntary market-based arrangement where a PFR provider merit-order emerges with only the lowest cost PFR providers dispatched.

Whilst welcoming the AEMC's efforts to develop a design, the AEC considered the task incomplete, in that the design was described at a high-level and without quantitative modelling or backcasting. The AEC was particularly concerned that the AEMC intended to pass such an incomplete design to AEMO for implementation. The AEC was unconfident that AEMO would produce a timely design consistent with the AEMC's objectives.

The AEC strongly recommended that instead the AEMC defer its completion of the rule change in order to properly study, refine and ultimately specify a detailed design for AEMO to follow.

The AEC is pleased to recognise that the AEMC has done exactly this. In particular its engagement of Intelligent Energy Systems (IES) has obtained the greatest available expertise in the design and modelling of such an arrangement. Their modelling has greatly increased the AEC's confidence in the design.

In its October 2021 submission the AEC also proposed that following completion of the design and analysis, the AEMC should conduct an additional round of consultation. The AEC is pleased to note the Directions Paper appears consistent with this suggestion.

System Services Objective

The AEC considers the three pillars of the objective well described and consistent with good market design. In particular it focuses on efficiency, with respect to the operational *and* investment timeframe.

The latter is strongly welcomed, and contrasts with the Mandatory PFR rule change made in 2020 that was wholly focussed on resolving a problem in the operational timeframe. As a result it concluded upon the most expedient way to obtain PFR from the existing fleet, without consideration of the investment timeframe.

Enduring Mandatory PFR Obligation

The AEC understands that the AEMC considers the question of enduring narrow-band mandatory PFR was settled at the Draft Determination stage and this Directions Paper is not seeking comment on that. However, the AEC requests the AEMC reconsiders its draft position prior to the Final Determination, particularly in light of the excellent progress it has made on a PFR incentive mechanism.

Firstly, there is considerable evidence that an adequate frequency control characteristic can be obtained with a much smaller range of contributors from the existing fleet than the mandatory rule obliges, evidenced by the dramatic improvement achieved by tranche one of its implementation. This gives confidence that PFR can be adequately supplied through a voluntary market despite not having all potential providers participating.

Secondly, it is also clear that the mandatory PFR arrangements are distorting the existing Frequency Control Ancillary Services (FCAS) markets. In particular, mandatory PFR appears to be performing the majority of post credible contingency frequency control, for which paid FCAS contingency markets are intended to resolve. This in turn lowers the expectations upon participants' delivery in those FCAS markets, meaning the those markets' values are unlikely to reach the efficient level that would appropriately compensate for the delivery of post-contingent frequency control.

Thirdly, there is evidence of a skew in the frequency characteristic post the implementation of mandatory PFR. Whilst the exact cause of this is unknown to AEC, it suspects it relates to the asymmetry of mandatory PFR provision without energy reserve. The AEC warned of this as a likely outcome in its submissions to the mandatory PFR rule change.

The original mandatory PFR rule incorporated a three-year sunset. This was consistent with the sense of urgency that existed at the time yet provided an opportunity to replace it with a more efficient mechanism that also included an investment signal. It was consistent with the AEC's suggested "[pathway](#)" of first implementing such a mechanism in the presence of narrow-band mandatory PFR, then, when experience and confidence was achieved, it could be safely adjusted to mandatory wide-band PFR. The mechanism would then provide sufficient incentive for low-cost providers to voluntarily maintain acceptable normal operating frequency.

The AEC requests that the AEMC take this opportunity to revisit the AEC's pathway. The AEMC has now developed what appears to be a very promising incentive mechanism consistent with the expectations of the pathway. After an initial period of operation, the market will be confident to move the Primary Frequency Control Band (PFCB) out to wide control, e.g. $\pm 0.5\text{Hz}$ where it would act as a last-resort protection to extreme events but not greatly interfere with voluntary provision for normal operation nor the FCAS contingency markets.

Rather than deleting the sunset at the conclusion of this rule change, the AEC suggests that it be *deferred two years, into mid-2025*, which would place it 12 months post the expected implementation of the incentive mechanism. The retention of a sunset, even if deferred, would keep the pathway's expectations clear and would not require re prosecution of the reasons for relaxing mandatory PFR.

Broad design of the Incentive Mechanism

With support from the Australian Renewable Energy Agency (ARENA), the AEC engaged IES in 2021 to develop and study in detail a “[double-sided causer pays](#)” mechanism to reward PFR frequency deviation correctors, funded by frequency deviation causers. At the time of engagement, this mechanism was envisaged to apply without mandatory narrow-band PFR. The AEC is pleased with how this consultancy furthered the acceptance of such mechanisms, but recognised two serious design shortcomings should mandatory narrow-band PFR be retained:

- The original design intended for the value of the incentive to be proportional to the frequency deviation, i.e. the signal progressively strengthens as the frequency deviates further from 50Hz. This self-correcting approach is entirely consistent with a voluntary market, with price being low when supply exceeds requirements, but increasing as it comes closer to balance. However mandatory narrow-band PFR creates a perpetual over-supply which would destroy the signal. Without such a signal, there would be no incentive for investment to replace the current providers as they exit, with the result that the value would lurch from very low to extremely high at some future date.
- The design relied on a parameter tuned by the market operator to find the appropriate frequency control. This would require judgement based on historical frequency performance – it would be reduced if standards are bettered and vice-versa. This is analogous to how AEMO historically determined the volume of FCAS regulation procurement. However, the feedback mechanism would be distorted by mandatory PFR which produces a tighter frequency than the mechanism itself is incentivising.

The AEC is pleased to observe that the work by AEMC and IES has improved the earlier design and appears to address the above two concerns:

- Scaling the value of the incentive by the maximum gross dispatch error within a dispatch interval appears to elegantly resolve the first distortion created by the presence of mandatory PFR. This is because it determines the strength of the incentive based on the amount of “work” that frequency correctors are observed to be performing, rather than on the outturn frequency. The reason the outturn frequency with mandatory PFR is so tight is precisely because providers are doing so much “work”, and this design appears to recognise and reward this work.
- The use of a transparent external price signal, the Regulation FCAS price, averts the need for the design to rely on a parameter tuned by AEMO. Naturally this is more attractive to the AEC. However the AEC observes that the Regulation FCAS price is not a perfect analogy to the value of PFR as it arises from the enabling of frequency response, rather than the delivery of actual response, and incorporates energy reserves. However the other alternatives suggested in the paper, such as energy price, are not necessarily superior. At this time the AEC supports the AEMC's choice.

Reference Trajectory

The AEC appreciates the AEMC's efforts to consider and discuss the merits of basing the base reference trajectory on either the pure energy dispatch target trajectory or the target plus regulation component for those generators enabled for FCAS regulation.

Including the regulation component seems more intuitive however the AEC understand it results in implementation difficulties and some anomalies. The analysis provided by IES suggests that not including the regulation component should not materially disadvantage FCAS providers. In any case, if it is perceived to do so, then at least FCAS Regulation providers can incorporate the expected disadvantage into their FCAS Regulation offers.

On balance, the AEC prefers the AEMC's recommended design, but also supports excluding this choice from the rules and permitting AEMO the freedom to adjust the design as more experience comes to light.

Impact on existing Causer Pays

The proposed reforms create a PFR incentive *and* significantly reform the existing causer pays mechanism for funding FCAS regulation. The AEC observes:

- FCAS regulation costs will be split into two:
 - Recovery of services "used" in a dispatch interval, i.e. to the extent enabled providers are given deviation signals, will be recovered from deviation causers within the same dispatch interval, thus avoiding the four-week lag in the current process. This will provide a sharper signal and seems fairer with respect to the causers of the real-time deviation.
 - Recovery of services enabled but "not used" in a dispatch interval will continue to be funded from lagged causer-pays factors. This is analogous to a form of capacity payment for maintaining a safe level of FCAS Regulation support even if, with hindsight, that level was not required for a particular dispatch interval. Recovery from historical causers remains appropriate, as they set the bounds of what ongoing capacity must be recruited. This design also avoids settlement anomalies in intervals where dispatched units perform very close to target.
- Causer pays factors will be determined on a Dispatch Unit Identifier (DUID) basis and not aggregated by portfolio as they are at present.

The AEC notes that in 2017-18 AEMO undertook a [review](#) of the causer pays process. That review determined that factors should be determined closer to real time, and should not be aggregated by portfolio. These recommendations were however not acted upon, which the AEC [criticised](#) at the time.

The AEMC's redesign however appears to deliver on these overdue recommendations and are thus supported.

Results of IES analysis

The backcasting exercise performed by IES is a very important part of the design process which has well justified the decision to extend the final determination. The finding that the design would have resulted in a gross turnover of similar order to the FCAS Regulation market provides some confidence in the appropriateness of the design.

Further that the bulk of the value directs to frequency enabled large-scale batteries and black coal units subject to mandatory PFR is appropriate and expected. The value won by frequency correcting batteries gives initial confidence that an appropriate investment incentive is created.

Rule structure and implementation

The AEC has not performed due diligence into the proposed rule drafting and trusts it has been adequately reviewed by AEMC and AEMO as to its consistency with the presented design.

In codifying any market reform that is to be implemented by AEMO, a balance must be struck between specificity and flexibility. Participants are often concerned that if the design is not explicitly detailed in the Rules, then AEMO may not implement it as intended. However, as the AEMC has developed and modelled a reasonably clear design through this process, the AEC is less concerned about a lack of specificity as it was at the Draft Determination stage.

The AEC recognises that AEMO has freedom to consult further and specify more or alter some features of the design, such as the target trajectory. Given the circumstances, the AEC supports this and considers that the AEMC has broadly found the right balance in the draft Rules.

Reporting

The AEC supports the addition to AEMO's reporting requirements in 4.8.16(b).

The AEC notes the additional cost reporting requirement upon the Australian Energy Regulator in 3.11.2A(b)(1)(v). The AEC agrees that this is a consequential extension of 3.11.2A(b)(1)(i) following implementation of frequency performance payments, however it also notes there is no equivalent proposal to describe the value of the payments to the system nor for a consequential extension of the volume information of (i) or (iv). The AEC suggests that the AER's reporting arrangements should extend to these factors.

Conclusion

The AEC welcomes the valuable progress the AEMC has made, supported by IES, during the extension to the Final Determination. This has resulted in a superior and better understood incentive mechanism and the AEC looks forward to its implementation. The AEC notes the following key advancements:

- An incentive design less diluted by the presence of oversupplied mandatory narrow-band PFR from the traditional fleet;
- A design that is not reliant on a parameter derived and adjusted from AEMO's judgement;
- Backcasting analysis indicating a turnover that is material yet fair considering the importance of PFR to system security and the need for an investment incentive;
- Significant changes to the existing Causer-Pays FCAS regulation cost recovery mechanism that elegantly deliver on overdue reforms.

Whilst not consulted in this Discussion Paper, the AEC maintains its view that mandatory narrow-band PFR should not be enduring. Noting that this very promising incentive regime is expected to be implemented in mid-2024, the AEC suggests extending the existing sunset to mid-2025, and thereafter replacing it with mandatory wide-band PFR.

Any questions about this submission should be addressed to me directly, by email to ben.skinner@energycouncil.com.au or by telephone on (03) 9205 3116.

Yours sincerely,



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