



**EnergyAustralia**

LIGHT THE WAY

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Dear Commissioners,

### **FREQUENCY CONTROL RULE CHANGES (ERC0263, ERC0296)**

EnergyAustralia (EA) welcomes the opportunity to comment on the Australian Energy Market Commission's (AEMC's) directions paper on Frequency Control Rule Changes for the National Electricity Market (NEM).

EA is one of Australia's largest energy companies with around 2.5 million electricity and gas accounts in NSW, Victoria, Queensland, South Australia, and the Australian Capital Territory. EA owns, contracts and operates an energy generation portfolio that includes coal, gas, battery storage, demand response, solar and wind assets. Combined, these assets comprise 4,500MW of generation capacity.

EA is dedicated to building an energy system that lowers emissions and delivers secure, reliable and affordable energy to all households and businesses. EA is, therefore, appreciative of the AEMC's efforts to investigate new regulatory settings for Fast Frequency Response (FFR) and Primary Frequency Response (PFR) in light of ongoing and significant market, technological and operational change. Ensuring these settings are fit for purpose will be a vital enabler of a rapid and robust energy market transition.

The critical points in this submission are:

- EA agrees with the AEMC that there is significant uncertainty around future, projected, system inertia levels owing to the large number of inertia and frequency reform initiatives on foot.
- Given this, EA strongly supports a comprehensive cost-benefit analysis being undertaken to compare FFR market establishment against other possible reform options. EA considers such an integrated approach is imperative to minimise implementation costs and ensure optimally efficient customer and reform outcomes.
- If an FFR market is shown to be economically superior to alternative options, EA will support the addition of two new markets to the existing suite of Frequency Control Ancillary Services (FCAS) markets. This would allow for the greatest

transparency, consistency with other FCAS arrangements and easiest implementation pathway.

- Although being supportive of differential pricing in concept, EA questions its value in practice, noting its administrative burden and uncertain economic benefits.
- In contrast, EA considers there is likely to be greater economic merit to valuing inertial response as part of an FFR market if a cost-benefit analysis shows such a market to be superior to alternative reform options.
- EA supports further exploration of the demand curve concept, given its potential to improve transparency and reporting of the Australian Energy Market Operator's (AEMO's) FCAS procurement performance.
- EA also supports the use of trials and regulatory sandbox arrangements to support an efficient FFR market implementation, should an FFR market be shown to be economically efficient.
- EA agrees with the potential for negative FFR and PFR interactions and considers these would be best obviated by dropping the mandatory PFR obligation and implementing a market-based solution in concert with EA's preferred solution under enduring pathway 3.
- Such a solution would be consistent with recent PFR implementation data showing the inefficient, mandatory requirement is not necessary to improve NEM frequency performance and would be better suited to promoting investment in new technology to underpin more efficient PFR delivery.
- EA supports the revision of the causer pays framework to provide greater clarity, transparency and timeliness on how participant behaviour affects FCAS cost allocation. Doing so would sharpen the economic incentives associated with generator actions, thereby promoting more efficient FCAS market outcomes.
- Similarly, EA strongly supports a comprehensive review of the Frequency Operating Standards (FOS) and the use of independent advice to inform FFR and PFR deliberations. However, EA considers the FOS review should occur first given its key determinative role in guiding rule-making and operational investment decisions.
- EA and other members of the Australian Energy Council (AEC) look forward to sharing and discussing outcomes of the double-sided causer pays work being progressed jointly with the Australian Renewable Energy Agency (ARENA) and Intelligent Energy Systems (IES).

Responses to specific questions are provided below, and we would welcome the opportunity to discuss this submission further with you. Should you have any questions, please contact me via [bradley.woods@energyaustralia.com.au](mailto:bradley.woods@energyaustralia.com.au) or on 03 8628 1293.

Regards,

**Bradley Woods**

Regulatory Affairs Lead

**Question 1: What are stakeholders' views on the problem definition and reform objective for FFR as set out in section 4.5.3 of the directions paper?**

EA agrees with the AEMC's analysis of the problem definition and reform objective. EA also appreciates the 'size of the prize' research on establishing an FFR market. Despite this, EA considers that there is significant uncertainty around future, projected, system inertia levels and notes that any reform which mitigates the expected reduction in system inertia will undermine the case for an FFR market. Presently, there are a number of such reforms which could directly or indirectly influence this, including:

- Hydro Tasmania's Synchronous Service rule change proposal, which would explicitly value inertia and other synchronous services in dispatch;
- development of an inertia spot market as mooted through the Energy Security Board's (ESB's) Essential System Services (ESS) Market Design Initiative (MDI);
- the new System Strength Framework being developed by the AEMC which would see requisite levels of system strength being maintained at all times rather than at minimum levels, and which could also be applied to inertia;
- the Engineering Framework being developed by the Australian Energy Market Operator (AEMO), which will prioritise solutions to technical system issues such as inertia in different parts of the grid; and
- consultations relating to the technical standards and access regimes of Renewable Energy Zones (REZs) such as the ESB's Stage Two REZ consultation and the New South Wales' Energy Roadmap.

Other possible implications for FFR may stem from frequency developments. As noted in the consultation paper, this could occur from changes to Primary Frequency Response (PFR) obligations. However, it could also result from changes in generator technical performance standards, the forthcoming review of the Frequency Operating Standard (FOS) and any other initiative aimed at improving contingency frequency response.

Given these developments, EA strongly supports a comprehensive cost-benefit analysis being undertaken to compare FFR market establishment against other possible reform options. EA notes that the investigations into many of these options are due for completion by Q3 2021. This is also consistent with the proposed timing of AEMO's annual inertia review and related constraints formulation. It would therefore seem to present the best opportunity for a final 'horse-race' style cost-benefit analysis, where all options can be appropriately and adequately evaluated.

Although this may require a small delay to proposed implementation timing to accommodate, EA considers such an integrated approach is imperative to ensure that optimally efficient customer and reform outcomes result. For example, by reducing the need for other future consultation and associated implementation costs if solution preferences change.

**Question 2: What are stakeholders' views on the pros and cons of establishing new FCAS market arrangements for FFR services versus revising the existing arrangements to incorporate FFR within the fast raise and fast lower services? Do stakeholders agree that the existing arrangements for contingency FCAS provide an appropriate model for FFR market arrangements? What are stakeholders' views on how each of the proposed procurement arrangements**

**for FFR would interact with the arrangements for the existing contingency services? Are there any aspects of the existing contingency FCAS arrangements that should be varied for procurement of FFR services?**

If an FFR market is shown to be economically superior to alternative options, EA will support the first procurement option. That is, the addition of two new markets to the existing suite of Frequency Control Ancillary Services (FCAS) markets. Although requiring new market ancillary service classifications, EA considers this is to be preferred over option 2 which would likely require changes to the Market Ancillary Service Specification (MASS) and have consequential impacts on registration eligibility for some existing FCAS service providers. As highlighted in the consultation paper, option 1 would also allow better tailoring of performance characteristics and operational considerations as part of FFR provision.

**Question 3: What are stakeholders' views on the pros and cons of maintaining the existing FCAS pricing arrangements for FFR services? What are stakeholders' views on the potential pros and cons of incorporating performance based multipliers into the pricing arrangements for FFR services? Do stakeholders have any other comments or suggestions in relation to the pricing arrangements for FFR services?**

EA considers that maintaining the existing FCAS arrangements in line with option 1 would allow for the greatest transparency, consistency with other FCAS arrangements and easiest implementation pathway.

Although recognising the conceptual benefit from differential pricing, such as greater investment incentives for faster responding technology, EA questions whether this would be required or optimal in practice. For example, it may be cheaper overall not to pay performance scalars if adequate frequency response can be procured, even if it is slightly slower than if scalars were employed.

EA also notes that implementing differential pricing would place additional administrative and cost burden on AEMO. For example, from having to calculate the speed of response to a standard frequency disturbance in each dispatch interval, and which would require accounting for the complexities of system inertia, system load and size of the largest credible risk.

With respect to the issue of effective double-counting of fast response technology under the current volume weighting approach, EA notes this would be much less of an issue should option 1 be implemented. That is, given the increased specificity afforded by the additional service categories. EA also considers this could be readily solved by amending the calculated registered capacity of fast response providers or increasing the procurement quantity to account for such double counting. Given this and the other reasons noted above, EA considers the value from differential pricing and the use of scalars to be questionable at best, and potentially uneconomic at worst.

**Question 4: What are stakeholders' views on the arrangements for the allocation of costs for FFR services? Would it be appropriate for the cost of FFR**

**services to be allocated in a similar way to the existing arrangements for the allocation of contingency FCAS costs?**

EA supports FFR costs being allocated in a similar manner to contingency FCAS costs. However, consistent with the answers to 16 and 19 below, EA considers that existing arrangements for apportioning contingency and regulation FCAS costs could be improved to promote more effective and efficient outcomes. That is, by providing more granular, real-time information to participants on their performance so they can better align operational actions with their commercial imperatives.

**Question 5: Are stakeholders aware of any additional issues that the Commission should take into account in developing market ancillary service arrangements for FFR?**

EA has no comments on this question.

**Question 6: What are stakeholders' views on the valuation of inertial response as part of the contingency services, including the proposed new FFR contingency services?**

Assuming a rigorous cost-benefit analysis was undertaken and an FFR market was deemed to be most economic, this would suggest that other measures for increasing the general level of system inertia were economically suboptimal. In this context, there would therefore seem to be greater value to rewarding the inertial response as part of an FFR market. Even if, as noted in the consultation paper, this would not accurately reward the entire inertia response given the measurement differences (MW for FFR against MWs for inertia).

**Question 7: What are stakeholders' views on the potential pros and cons associated with the implementation of a "demand curve" approach to procurement of FCAS? What are stakeholders' views on the priority of such a change to the market frameworks? If such an approach was to be implemented, what are stakeholders' views on the appropriate governance arrangements, including the potential oversight role for the AER?**

Current arrangements permit AEMO wide latitude in determining the procurement quantity of market ancillary services based on power system security needs. EA supports such flexibility but considers reporting transparency and economic justification of current arrangements could be improved. For example, the need for recent increases in the quantity of regulation FCAS as a result of Automatic Generation Control (AGC) tuning has not been justified economically. EA considers a demand curve approach coupled with an adequate reporting, auditing and governance framework, and including an oversight role for the Australian Economic Regulator (AER), could improve this. Once again, however, it is critical that a rigorous cost-benefit analysis is undertaken to establish whether the successful international application of demand curves can be replicated domestically. Given the complexities associated with such work, EA supports a separate review process to consider the application of demand curves to all ESS appropriately.

**Question 8: What are stakeholders' views in relation to the potential interactions between new FFR arrangements and the Mandatory PFR arrangement?**

EA agrees with the AEMC's assessment on the potential interaction issue between PFR and FFR when there is a mandatory requirement outside of a narrow frequency response band. Unfortunately, the mooted variable droop solution would not be appropriate for all technologies. For example, even some recent grid-scale battery installations are limited to a fixed number of potential settings. This may not allow the requisite control desired to obviate interaction issues while still allowing participants the freedom to operate plant consistent with their business objectives. EA considers this is yet another reason why the mandatory obligations around PFR should be dropped, with an alternative market-based, wide deadband solution implemented to replace it as described in answer to question 10.

**Question 9: What are stakeholders' views in relation to the process for the implementation of FFR arrangements in the NEM? What are stakeholders' views on the potential need for interim or transitional arrangements as part of the transition to spot market arrangements for FFR?**

EA agrees with the need for staged implementation, noting the actual steps will differ depending on what FFR design choices are ultimately implemented. In this respect, EA supports the use of trials and sandboxing arrangements to facilitate the necessary learnings to underpin a successful and efficient, full-scale FFR roll out.

**Question 10: Do stakeholders agree that a mandatory PFR arrangement provides a valuable safety net to help protect the power system from significant non-credible contingency events? Do stakeholders agree that the narrow, moderate and wide settings for a mandatory PFR response band, adequately represent the broad policy options for the frequency response band for Mandatory PFR?**

EA agrees that the three settings broadly encompass the breadth of potential policy solutions. Further, that the current mandatory PFR obligation provides a safety net to protect the power system from significant non-credible contingency events. However, the question as to whether the current approach is an economic or valuable approach can only be answered in the negative.

Although it is true that the most recent reports on the NEM frequency distribution have shown a marked improvement in frequency performance, this has occurred with only those generators above 200MW having applied the new, tighter PFR settings. Moreover, the incremental benefit in frequency performance has decreased as more machines have been included. Both these results show that imposing costs on all generators via a mandatory obligation is:

1. not required to effect an improvement in NEM frequency performance,
2. much less efficient than a market-based approach that would provide the optimal level of PFR based on the marginal cost of procurement from machines that supply the most effective frequency response, and
3. does nothing to promote development or investment in new technology to provide more efficient PFR delivery that would be incentivised under a market-based, wide deadband approach.

**Question 11: What are stakeholders' views on the problem definition and reform objectives for enduring PFR arrangements set out in section 5.4?**

EA agrees with the problem definition and reform objectives. In particular, the necessity and value from a review of the Frequency Operating Standards (FOS). However, EA contends such a review should occur as a primary step before the others. The role of the Reliability Panel is to set desired frequency performance by balancing system security and cost trade-offs, with mechanisms to achieve these implemented through various rule changes and technical advice. The current plan seems to invert this process with a FOS review coming after such mechanisms have been decided. EA does not see how such an inversion can usefully aid the setting and attainment of optimally economic frequency outcomes.

**Question 12: What are stakeholders' views of the example curves for costs and benefits of Mandatory PFR with respect to the frequency response band settings, set out in figure 5.4? Do stakeholders agree that the frequency response band setting is a key variable for the determination of enduring PFR arrangements that meet the power system needs and are economically efficient over the long term? What are stakeholders' views on the effectiveness of the exemption framework under the Mandatory PFR arrangement? What are stakeholders' views on the role that the allowance for variable droop settings plays in relation to the cost impacts of Mandatory PFR? Based on the initial roll out of the Mandatory PFR arrangement to generators over 200MW, what are stakeholders' views on how the cost impacts of Mandatory PFR are impacted by the proportion of the fleet that is responsive to frequency variations? What other considerations are there in relation to developing effective and efficient arrangements for PFR in the NEM?**

EA agrees with the AEMC's characterisation of the economic trade-offs associated with PFR provision. Further, that the response band setting and the marginal cost of provision are key variables impacting this trade-off. However, EA notes this is a purely conceptual framework and questions how the AEMC can reasonably back enduring pathway 2, per question 17 below, without a comprehensive cost-benefit being undertaken to substantiate this preference.

EA also notes that the conceptual framework does not readily capture the effect of investment incentives on the long-run supply of PFR. That is, the likelihood of PFR supply remaining if unrewarded. For these reasons, EA considers a cost-benefit analysis be undertaken to compare the relative merits of each enduring pathway under various cost curve and long-run supply assumptions. This will help to ensure that the chosen pathway is in the economic interests of all market participants, particularly customers.

In terms of the exemptions framework, EA notes that this question becomes redundant under a market-based approach. That is, where each individual participant chooses whether to participate based on the relative efficiencies of its potential PFR service offering.

**Question 13: What are stakeholders' views of the Commission's proposed approach to obtaining independent advice to inform its determination of enduring arrangements for PFR in the NEM?**

EA strongly supports this approach and notes that further information on the double-sided causer pays trial will also be forthcoming. EA and other members of the AEC welcome the opportunity to discuss this work, and other independent findings, when available.

**Question 14: What are stakeholders' views on three options identified for further consideration?**

EA agrees that the three options presented cover the appropriate range of solutions for procuring narrow band PFR. Of these, EA considers options 2 (new market ancillary service arrangements) and 3 (incentive-based provision) would be most compatible with a market-based procurement approach. In particular, if the Primary Frequency Control Band (PFCB) is widened via EA's preferred enduring pathway option 3, and there is no mandatory PFR requirement.

**Question 15: What are stakeholders' views on the arrangements for the pricing of PFR as described in section 5.6.2?**

Consistent with the answers above, EA supports pricing arrangements that provide robust and transparent signals to market participants to invest in and operate generation plant to deliver maximally efficient PFR outcomes. EA, therefore, does not support a regulated pricing approach which, although administratively simple, is unlikely to value PFR provision accurately, especially as market conditions change. The results of the double-sided causer pays work currently underway will help to inform which other pricing options are to be preferred.

**Question 16: What are stakeholder's views on the allocation of costs for narrow band PFR services as described in section 5.6.3? Do stakeholders agree that the any additional costs for narrow band PFR be allocated through the existing causer pays procedure for the allocation of regulation costs, or a revised version as described in section 5.9?**

EA highlights that double-sided causer pays and deviation pricing options are internally self-funding and will not require any allocation through existing mechanisms. If another pricing option results, then consistent with the answer to question 19 below, EA would support the revision of the causer pays framework to provide greater clarity, transparency and timeliness on how participant behaviour affects regulation cost allocation. Doing so would sharpen the economic incentives associated with generator actions and promote more efficient FCAS market outcomes.

**Question 17: What are stakeholders' views on the enduring PFR pathways? Do stakeholders agree with the Commission's preliminary preference for pathway two? (the widening of the PFCB and the introduction of market arrangements for narrow band PFR)**

EA strongly supports enduring pathway 3, which would abolish the mandatory PFR requirement. EA considers this is the pathway that will promote the greatest economic

efficiency and investment incentive in PFR provision. For example, by allowing market competition to generate the most cost-efficient procurement outcomes.

EA notes this outcome would be somewhat retarded under enduring pathway 2 given its mandatory provision requirement. However, EA would support a version of enduring pathway 2 (mandatory PFR with a moderate or wide band response) if the economic benefits of maintaining a less onerous mandatory PFR requirement on the grounds of resiliency is shown to be greater than those seen from enduring pathway 3.

**Question 18: What are stakeholders' views of the Commission's proposed approach towards a future review of the FOS as part of the development of enduring PFR arrangements?**

EA strongly supports a review of the FOS and considers they play a key determinative role in guiding rule-making and operational investment decisions to ensure relevant frequency performance measures are set and met. Given this role, EA considers such a review should come before the other mechanistic and rules-based work proposed in the AEMC timeline.

**Question 19: What are stakeholders' views on the proposal to allocate regulation costs on the basis of performance against system frequency as opposed to Frequency indicator(FI)? What are stakeholders' views on the proposal to align the sample and application periods for determination of causer pays factors and shorten the application period to 5 minutes, in line with the NEM dispatch interval? What are stakeholders' views on the removal or shortening of the ten-day notice period for causer pays contribution factors? What are stakeholders' views on AEMO's proposal to pre-calculate seven sets of contribution factors including local contribution factors? What are stakeholders' views of AEMO proposal to include non-metered generation in the residual component for allocation of regulation costs?**

EA strongly supports changes to the causer pays arrangements and considers the intent should be to strengthen the connection between generator action and FCAS cost allocation as far as possible. Doing so will promote the most efficient FCAS market outcomes by allowing participants to better assess and respond to market signals. In this respect, EA supports all the initiatives listed in the consultation paper, particularly those that support more accurate and timely information provision to participants. For example, access to real-time plant performance metrics.