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Submitted via website

RE: Clarifying mandatory primary frequency response obligations for bi-directional plant[1]

Iberdrola Australia delivers reliable energy to customers through a portfolio of wind capacity across New South Wales, South Australia, Victoria, and Western Australia, including both vertical integrated assets and PPAs. Iberdrola Australia also owns and operates a portfolio of firming capacity, including open cycle gas turbines, dual fuel peaking capacity, and battery storage. Our development pipeline has projects at differing stages of development covering wind, solar and batteries. This broad portfolio of assets has allowed us to retail electricity to over 400 metered sites to some of Australia's most iconic large energy users.

Iberdrola Australia is part of the global Iberdrola group. With more than 120 years of history, Iberdrola is a global energy leader, the world's number-one producer of wind power, an operator of large-scale transmission and distribution assets in three continents making it one of the world's biggest electricity utilities by market capitalisation. The group supplies energy to almost 100 million people in dozens of countries, has a workforce of more than 37,000 employees and operates energy assets worth more than €123 billion. Our global expertise positions us to deliver an integrated approach to decarbonisation across Australia, including through our hydrogen and networks businesses.

1. Overview of our submission

Our submission considers AEMO's rule change request as broadly comprising three parts, relating to the implementation and provision of mandatory primary frequency response (mPFR). These parts are:

1. A proposed correction of a drafting error that would have excluded bi-directional resources from the mPFR requirement.
2. Requiring bi-directional resources (BDR), such as batteries, to provide mPFR when enabled for FCAS
3. Requiring bi-directional resources, such as batteries, to provide mPFR when charging.

[1] https://www.aemc.gov.au/rule-changes/clarifying-mandatory-primary-frequency-response-obligations-bi-directional-plant

The first part of this rule change appears straight forward, and we agree should be corrected. We note that this could have been efficiently considered through a targeted and non-controversial change request.

Parts 2 and 3 relate to two Rules and a Review that were implemented over the past four years. The AEMC already provided recent final determinations on these issues, and AEMO has not provided in their submission any new analysis or evidence (nor have their been any fundamental changes in the grid or policy in the past 8 months) that should change the Commission's previous determinations. We note the Integrating Energy Storage rule change provided new registration categories, but did not fundamentally change investment cases or the physical grid.

Previous quantitative analysis undertaken by Iberdrola Australia shows that AEMO's proposed rule would impose material costs on new batteries, reducing their life by continuously charging and discharging. This rule change would therefore mandate additional costs on batteries, potentially deferring investment in critical resources and impairing system security, reliability, and emissions reduction opportunities. AEMO's request therefore conflicts with the NEO on reliability, security and (upcoming emissions grounds, and may put at risk the States' and Commonwealth's targets for investment in battery and firming technologies.

Furthermore, while AEMO and the AEMC have framed this rule change as "seeking to resolve uncertainty", it is problematic to reopen issues that were considered only 8 months earlier (and that were supported by three years' of discussion and analysis). Regulatory uncertainty risks delaying critical investment and places state and commonwealth decarbonisation targets at risk, which we consider should be a key focus of Australia's key regulatory bodies. Repeatedly returning to already resolved issues also distracts businesses from engaging on more critical and positive reforms, such as the Commonwealth Capacity Investment Scheme and state Renewable Energy Zones.

Finally, many batteries should choose to voluntarily provide this service, particularly when the Frequency Performance Payments framework commence in 2025[2] or simply to simplify operations.

On this basis, we do not support the balance of AEMO's rule change request at this time. It is important that the AEMC rejects this rule change quickly so as to restore investment certainty.

[2] AEMC's modelling suggested this: https://www.aemc.gov.au/sites/default/files/2022-12/GHD%20PFCB%20analysis%20-%20final%20report_21NOV2022%20%281%29.pdf

We suggest, however, that requiring mPFR from capable loads and energy storage systems when charging is reasonable once the frequency performance payments commence in 2025, and could be reconsidered at that time. We note that this change would recognise that energy storage systems are not the same as other loads, and should not be treated on the same basis. The AEMC should consider other frameworks, such as explicitly exempting TUOS and DUOS charges for energy storage systems that are not acting as loads, from this perspective.

We provide further detail below.

2. Background and context

Quantitative analysis does not support AEMO's proposal

AEMO's rule change has previously been considered across three key rule changes and reviews:

- Mandatory primary frequency response[3]
- Primary frequency response incentive arrangements[4]
- 2022 FOS Review[5]

Our submission should therefore be read in parallel with the 190 submissions already provided across these rule changes and, in particular, Iberdrola Australia and Infigen Energy's previous submissions.

Iberdrola Australia previously agreed with AEMO and the AEMC that, given the deteriorating frequency performance, greater frequency control was required, subject to an ongoing cost-benefit analysis. Our primary historical concern was that the lack of an appropriate incentive framework would result in shortfalls on investment or operational timeframes or both, triggering expensive interventions in the future.

To date, AEMO has not provided analysis of current or future system frequency control needs. This includes no analysis of future system frequency control needs (demand), likely provision from available resources (supply), or the ultimate frequency distribution that would be acceptable from a system security perspective. This remains a significant gap in market knowledge of system needs, and we recommend this should be included in the upcoming Integrated System Plan modelling.

[3] https://www.aemc.gov.au/rule-changes/mandatory-primary-frequency-response
[4] https://www.aemc.gov.au/rule-changes/primary-frequency-response-incentive-arrangements
[5] https://www.aemc.gov.au/market-reviews-advice/review-frequency-operating-standard-2022

Therefore, Iberdrola has undertaken significant quantitative analysis of the various proposals in order to understand the function of the proposed mechanisms and the costs on participants. Full details are available in our previous submissions[6] including benchmarking against real-world performance in 2021[7].

Requiring PFR when dispatched at zero MW for FCAS services would require the battery to continuously charge and discharge. Each charge and discharge cycle produces wear and tear on the battery. Furthermore, batteries are only warranted for a fixed number of charge-discharge cycles over its lifetime (typically one per day). Our analysis found that the impacts of mPFR depend significantly on the frequency distribution of a future grid. Even if the frequency distribution ultimately settles at a historically acceptable distribution (which we modelled as the 2005 frequency distribution), a short-duration battery that provided only contingency FCAS (cFCAS) could use up to 17% of its warranted cycles in delivering the mPFR service. This could be a material cost impact on batteries, and would consume warranted cycles that would not then be available to deliver critical services at other times.

We note that the AEMC explicitly considered AEMO's rule change through these rules:

> *"The Commission considers that the application of the mandatory PFR requirement to battery energy storage systems that are not dispatched to generate electricity would be discriminatory"* (p46, Mandatory Primary Frequency Response Final Determination)
>
> *When operating in a charging mode, battery energy storage systems will be treated the same as other scheduled loads, which are not required to provide PFR.* (p46, Mandatory Primary Frequency Response Final Determination)

The AEMC subsequently confirmed the decision on mPFR from batteries in September 2022:

> *The final rule includes a minor amendment to NER clause 4.4.2(c1) to clarify that the mandatory PFR requirement applies to "each Scheduled Generator and Semi-Scheduled Generator that has received a dispatch instruction in accordance with clause 4.9.2 to generate a volume greater than zero MW". The reference to a dispatch instruction in accordance with clause 4.9.2 has been included in the final rule in response to stakeholder feedback that there was some ambiguity as to the application of the mandatory PFR obligation to battery energy storage systems that have a*

[6] https://www.aemc.gov.au/sites/default/files/2019-11/Rule%20Change%20Submission%20ERC0274%20-%20Infigen%20Energy%20-%2020191101.pdf
[7] p9 of https://www.aemc.gov.au/sites/default/files/documents/rule_change_submission_-_erc0263_erc0295_-_infigen_energy_-_20210207.pdf

> *zero dispatch target in the energy market but are dispatched to provide contingency (or regulation) FCAS.* (p29, Primary Frequency Response Incentives Arrangements Final Determination)

Incentives framework

We further note that AEMO subsequently advocated for a frequency performance payment mechanism (where Iberdrola again undertook first quantitative analysis of the scheme[8]) on the basis that it would provide a sufficient financial signal to cover the costs of providing mPFR and therefore participants would not be penalised by the mandatory requirement.

It is therefore unclear why AEMO or the AEMC would now advocate for *further* mandatory requirements, given that their proposed mechanism was accepted by the AEMC. It would also be contradictory for the Commission to now recommend further mandatory requirements, given that modelling commissioned by the AEMC through the FOS Review (2022) also reported that the framework would provide sufficient signals.

Mandatory requirements are not suitable for a future grid

Through their submission, AEMO argues that by requiring "all" resources to provide PFR at "all" times, AEMO will have "consistent and predictable PFR" availability.

However, this will not be how the future market operates. The future grid will be highly variable, both in supply and demand. In some periods, demand will be met entirely by inverter based VRE. In other periods, distributed rooftop PV systems may supply most or all of the NEM's demand.

The availability of PFR will therefore be highly variable over time, with no certainty of available response in terms of either capability or in terms of headroom. While we appreciate that AEMO is now recognising these risks, as previously raised by Iberdrola Australia[9] and other industry submissions, it is clear that mandating further response only from available resources will not address the fundamental challenges of uncertainty and frequency control.

If AEMO and AEMC no longer consider that the frequency performance payment mechanism will incentivise sufficient response, then the AEMC would need to properly reopen the previous processes. In particular, we consider that the AEMC

[8] https://www.aemc.gov.au/sites/default/files/2021-11/Iberdrola%20Australia%20-%20PFR%20Incentive%20Arrangements.pdf

[9] Section 2.2, https://www.aemc.gov.au/sites/default/files/2019-11/Rule%20Change%20Submission%20ERC0274%20-%20Infigen%20Energy%20-%2020191101.pdf

finally establish a new FCAS market that would require AEMO to identify the quantity of PFR that is required at all times and the amount of headroom required to meet it (which is not required under current PFR rules). Such a service could be procured through a new market that could be defined relatively simply as a 15 mHz FCAS market with suitable droop requirements.

3. Iberdrola Australia's recommendations

Our response to the three components are below.

Drafting change

We support the proposed drafting change to include BDU in the mPFR requirement.

Provision of mPFR when enabled for FCAS

The significant body of analysis by Iberdrola and others show that AEMO's rule change risks imposing material new costs on batteries, particularly as capacity exits. In turn, this risks deferring investment in high value, zero emissions firming capacity. This Rule is therefore not consistent with the NEO, as it would risk both reliability and security, emissions reduction targets, and increase system costs with no identified benefits.

Given there have been no material changes in assumptions since the Commission's determination in September 2022, we support the Commision's previous determinations and so recommend no changes to the NER at this time.

In practice, many batteries will choose to provide the service when enabled for cFCAS, either because there will be sufficient market incentive to do so or because it reduces the overall complexity of operation (i.e., if it is challenging to switch the response on and off). This is an appropriate, market-led response. We also note that the AEMC accepted Iberdrola Australia's recommendation to include a "lever" in the frequency performance payment framework, to ensure that incentives can be optimised over time. At this time, there is no new evidence to contradict the AEMC's previous determination.

Future provision of mPFR from batteries when charging

In the future, requiring batteries to provide mPFR while charging is not unreasonable, pending feedback from existing battery operators. At this time, Iberdrola Australia already voluntarily provides this service from our batteries to support the operation of the grid.

We note however, that this was considered by the AEMC across the previous rule changes, and it is not clear why it would now need to be addressed. We note the AEMC has referenced the Integrating Energy Storage rule change which introduced the bi-directional resource registration category, but this did not fundamentally change the operation of the grid or of investment in storage. If the AEMC has further quantitative evidence to support this mandatory requirement, it should only be re-considered after the frequency performance payments commence in 2025.

We note that AEMO and AEMC's approach to this component effectively recognises that energy storage systems are not the same as other loads. The AEMC should consider other frameworks, such as the application of TUOS and DUOS charges to energy storage systems, from this perspective.

AEMC's alternative proposals

Overall, as no material need has been identified in the rule change, or raised by AEMO in parallel with the previous processes, we do not see a justification for further changes to the Rules based on this proposal.

Voluntary reporting of frequency response settings could be addressed holistically through the parallel processes identified by the AEMC. The AEMC should be particularly cautious about creating any mechanism that is likely to operate as a one-way "opt in" framework. That could deter batteries and other resources from providing additional voluntary response when available. Batteries are highly flexible but energy limited resources, and it will be critical that this flexibility can be allocated to where it delivers most value.

4. Conclusion

By AEMO submitting the rule change and the AEMC progressing it, Australia's regulatory bodies could create increased uncertainty that on its own risks delaying investment. This follows years of similar uncertainty around day ahead market design proposals, transmission access reform proposals, and the capacity market proposals. Ultimately, state and Commonwealth ministers have refocused attention on more materially important issues to deliver a climate credible future.

We therefore recommend that the AEMC quickly resolve this rule change so that industry can quickly move to deliver investment so that government schemes such as the Commonwealth Capacity Investment Scheme, the Victorian Energy

Storage Target, and the NSW LDS and Firming LTESAs can be implemented quickly and at low cost.

We look forward to continuing to engage with the AEMC. Please do not hesitate to contact me if you have any questions on joel.gilmore@iberdrola.com.au.

Regards,

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