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To: AEMO
Submitted via email

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Re: Response to **Primary Frequency Response under Normal Operating Conditions**

Infigen Energy (Infigen) welcomes the opportunity to make a submission. Infigen owns portfolio of wind and firming capacity across New South Wales, South Australia, Victoria and Western Australia. Our renewable portfolio includes 670 MW of vertically integrated wind plus c90 MW of contracted capacity in Victoria. Infigen also owns and operates a portfolio of dispatchable firming capacity including a 123 MW open cycle gas turbine in NSW, a 25 MW / 52 MWh battery in SA, and will soon take ownership of 120 MW of dual fuel peaking capacity in SA. Infigen has also bought Power Purchase Agreements (PPAs) from wind farms, and is seeking additional wind and solar PPAs. Our development pipeline has projects at differing stages of development covering wind, solar and dispatchable firming capacity.

It is difficult to evaluate the proposed changes to the Market Ancillary Services Specification (MASS) and Causer Pays Procedure in the absence of at least a Draft Determination to the relevant AEMC rule changes.

As noted in Infigen's submission to the AEMC, Infigen does not support exempting providers of PFR from causer pay requirements (proposed amendment to clause 2(f)), including the proposed exemption from negative causer pays factors upon meeting certain PFR requirements. This, in our opinion, does not reflect the intended purpose of the Causer Pays framework and the full set of causes of regulation requirements.

The proposed changes are problematic in that they will not incentivise Generators who are not consumers of Regulation FCAS to provide PFR or compensate them for providing the service. Conversely, Generators who consume Regulation FCAS can avoid those costs by providing PFR, shifting those costs to consumers. This method does not quantify or value the cost of PFR and also distorts the costs of regulation FCAS to the consumers (it now includes the costs of PFR but bluntly rounded to zero).

We agree that, as needed, the MASS should be altered so that the Contingency FCAS requirements do not incentivise a delay in the delivery of PFR. Similarly, we support removing disincentives imposed by Causer Pays factor on Generators providing PFR, but this should be done in a targeted way.

More broadly, we note that battery energy storage systems may not be being fully utilised under current arrangements. For example, a battery can deliver up to twice its nameplate rating in contingency response within six seconds (and indeed faster), but may not be eligible to register that full capacity, depending on droop settings. Future primary frequency response and fast frequency response markets should ensure that this rapid response can be fully valued and utilised.

1. REMOVING NEGATIVE AGGREGATE FACTORS FOR PFR PLANT MEETING PFRR

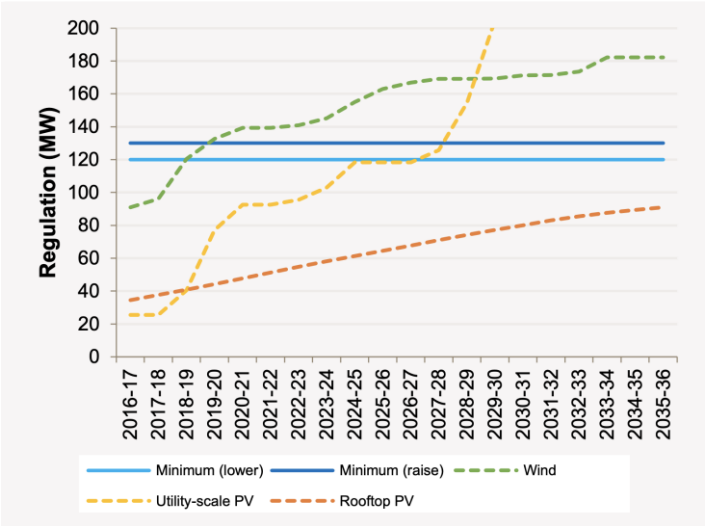
Infigen supports measures to ensure that participants who voluntarily support the system do not incur additional costs and are compliant with the NER.

However, exempting generators that deliver tight deadband PFR from Causer Pays seems out-of-step with the underlying causes of regulation FCAS and there is no reason to connect provision of PFR to regulation FCAS cost recovery. Tight deadband PFR does not guarantee that any response will be available (as it depends on headroom), and that it will remove the contribution of that unit to the regulation FCAS requirement[1]. Deviations from dispatch instructions, unplanned outages, and forecasting errors for renewable generators all contribute to the regulation requirement Therefore, some FCAS regulation service will still be required *even if* all units were providing PFR.

AEMO modelling indicates that utility scale solar farms will contribute to both Raise and Lower regulation FCAS requirements, driven particularly by uncontrolled movements. Enabling PFR from such stations would not remove or reduce this contribution to regulation FCAS. It would however, shield them from the costs they consume in regulation FCAS, potentially reducing incentives for improving performance within a 5-minute dispatch interval or, alternatively, from providing Regulation if technically capable.

[1] For example, Section 9 of ROAM Consulting's report to the IMO provides detailed analytics on the contribution of various errors to the load following service in the WEM (similar to regulation FCAS).
https://www.erawa.com.au/cproot/14768/2/ROAM%202014%20Ancillary%20Service%20Standards%20and%20Requirements%20Study%20Draft%20Report.pdf

Figure 1 AEMO modelling of contributions to regulation FCAS requirements[2]



Units that already do not have causer pay factors are not incentivised to provide PFR, or they provide additional services for no additional benefit. Participants are currently incentivised to reduce their contribution to the Regulation requirement, including by optimising their portfolios to minimise contribution factors. This incentive will be lost if the enablement of PFR zero's out a causer pay factor.

Exempting large portions of the generator fleet from Causer Pays would impose a greater share of costs on consumers, which is not consistent with the NEO.

Furthermore, this change would now seem incompatible with AEMO's proposal for *mandatory* tight deadband response. If both were implemented, a majority of the generation sector would be exempt from Causer Pays while still contributing to the need for regulation FCAS.

Infigen recommends that any modifications to Causer Pays be considered once the AEMC rule change process has been finalised, as part of the analysis on correctly valuing these services.

2. ALTERING THE MASS FOR CONTINGENCY FCAS PROVISION WITHING THE NOFB

Infigen broadly supports the general concept of recognising frequency response within the NOFB as contingency FCAS. Infigen agrees that Contingency FCAS should not disincentivise the operation of PFR within the NOFB and conversely should not penalise

[2] From p62, 2016 NTNDP, https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/NTNDP/2016/Report/2016-NATIONAL-TRANSMISSION-NETWORK-DEVELOPMENT-PLAN.pdf

enabled contingency FCAS providers for providing a response before frequency deviation outside of NOFB.

If a mandatory requirement is implemented, Infigen agrees that Method 3 seems to be the preferred option for assessing the total volume of contingency FCAS delivered, subject to sufficient data being available. In the case where data cannot verify the unit's response from when it crossed its frequency deadband to NOFB, that Method 1 could be fallen back on. An example would be an individual enabled for Contingency FCAS crosses its frequency deadband several minutes before the event and there was no availability of this data.

In the future, when a PFR mechanism is formalised Infigen supports a detailed consideration for the trade-off between PFR procurement and Fast Contingency FCAS market procurement. As above, Infigen recommends that any modifications to the MASS be considered once the AEMC rule change process has been finalised. We believe that depending on the outcome of the rule change process the design of this mechanism will need to be carefully analysed.

We note that counting response within the NOFB may lead to insufficient reserves being available if a contingency event occurs towards the edges of the NOFB (e.g., due to natural (slow) variations in supply and demand, the frequency is sitting at 49.86 Hz and a contingency event occurs; any contingency FCAS providers also enabled for PFR will have already used some response, and will not be eligible to deliver their full enabled response). This seems to be a reasonable trade-off of risk and cost, but AEMO should make these assumptions explicit (which becomes easier once a formal market for PFR is developed).

3. CONCLUSION

We look forward to the opportunity to continue to engage with AEMO. If you would like to discuss this submission, please contact Dr Joel Gilmore (Regulator Affairs Manager) on joel.gilmore@infigenenergy.com or 0411 267 044.

Yours sincerely

Joel Gilmore
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