



8 MAY 2020

To: AEMO

Submitted via email

Re: Response to **Interim Primary Frequency Response Requirements**

Infigen Energy Limited

Level 17, 56 Pitt Street
Sydney NSW 2000
Australia
T +61 2 8031 9900
F +61 2 9247 6086

www.infigenenergy.com

Infigen Energy (Infigen) welcomes the opportunity to make a submission. Infigen 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 Power Purchase Agreements (PPAs). Infigen also owns and operates a portfolio of 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. Our development pipeline has projects at differing stages of development covering wind, solar and batteries and we are also exploring further opportunities to purchase energy through capital light PPAs. 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.

Overarching comments

Overall, the Interim Guidelines document reflects the spirit of the Mandatory Primary Frequency Response (PFR) rule change, and is consistent with Infigen's understanding of the practical implementation of the Rule.

We note that AEMO is seeking to keep the document as high level as possible and for the document to not be specific for any one technology. However, in contrast to thermal generators that may have simply detuned or disabled governors in the past, many Variable Renewable Energy generators (VRE) generators have never operated in frequency response mode and their technical capabilities, or lack thereof, may not have been explored to date.

Infigen's comments are primarily around:

- clarifying the operational, testing, and exemption/variation requirements, particularly for VRE generators ;
- adopting appropriate implementation timelines (including credible response times for queries); and
- providing greater flexibility around deadband settings to ensure that the most capable units are not disadvantaged.

Requirement to provide PFR

Infigen suggests the requirement for Affected Generators to "*commence providing PFR every time they receive a dispatch instruction in the spot market of >0MW*"

needs to be further clarified. At present, it is not clear if this instruction includes regulation markets, enablement for FCAS markets or just dispatch in the energy market.

If AEMO's intention is for Generating Systems (GS) dispatched in the regulation market to provide PFR, AEMO should explicitly state the expected response for those units. For example, if PFR is to reduce output and AGC signal is to increase output, whether the response should be the sum of the signals or should the AGC signal be discarded. Similarly, for semi-scheduled generators when a cap is received lower than your maximum available output, but a frequency deviation would cause an increase in output (where possible), is there a priority of signals that should be followed? AEMO should provide explicit guidelines as to how conflicting signals should be treated.

Primary Frequency Response Parameters

The costs imposed on any single unit will depend on how active that unit will be in delivering PFR. Therefore, especially for smaller units, it is important that deadband settings are coordinated across all participants (to ensure, for example, that a small number of more capable units are not penalised for having that capability).

Infigen therefore does not support the *maximum* (most relaxed) deadband in the Primary Frequency Response Parameters (PFRP) being set to the *minimum* (most restrictive) threshold permitted in the Rules. AEMO has not provided evidence that this is the "right" deadband for **all** scheduled and semi-scheduled generators in the NEM. If the most flexible assets are forced to have much tighter deadbands, they will incur much higher costs than less flexible assets – disincentivising further capabilities, as highlighted in Infigen's previous submissions to AEMC and AEMO.

We therefore suggest that the required deadband setting be adjusted based on the outcome of self-assessments – with the maximum deadband setting being adjusted to reflect the "typical" capability of the fleet (e.g., the 90th percentile – if 90% of capacity can achieve a 0.015 deadband, then 0.015 likely to be appropriate).

Exemption criteria

The clause requiring participants to "demonstrate this incapability no matter what changes are made to the Affected GS by providing AEMO with copies of relevant original equipment manufacturer (**OEM**) specifications or test results" (emphasis added) seems onerous and arguably impossible to comply with – one cannot prove a negative. While this rule may be appropriate for thermal power stations, wind farms and inverter-based technologies have significantly more options available (e.g., replacement of control systems, etc., with exponential cost increases). We suggest a reasonableness test be applied – with consideration of the relevant OEM specifications, test results, and incremental changes to the plant.

It is also unclear what magnitude of costs will be deemed too excessive by AEMO in order to apply for a variation or exemption.



Providing evidence of expected ongoing costs will be difficult when there is little known about the outcome of this rule change, especially on generators that have never provided frequency response. We recommend that exemption principle 7.1.4 of the interim guidelines be made ongoing, such that participants relax deadband settings or be exempted if actual costs prove to be too high. This will maximise initial participation in the market and reduce costs to businesses (by not forcing participants to request exclusion upfront to manage uncertain risks).

Timeline

AEMO should clarify the explicit dates and timelines for implementation (rather than relative days, where possible).

AEMO's expectation of a 5-business day turn-around to queries from AEMO is unrealistic. For example, if the OEM needs to be contacted, this would be unachievable even under normal global business conditions. Infigen suggests given the potential complexity, a 20-business day timeframe (in line with AEMO's timeframe) is necessary. While AEMO has suggested that participants should already have all answers on hand, this is not realistic. Equipment that was not specified, nor designed to provide these services may require more extensive investigations and/or studies. Infigen does not accept that extensions can only be at AEMO's sole discretion; a negotiated framework is required.

CONCLUSION

We look forward to the opportunity to continue to engage with AEMO, particularly for technical aspects of wind farm and battery operation. 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

A handwritten signature in blue ink, appearing to read "T. A. Clark".

Tony Clark
Executive General Manager of Operations & Projects