



Ben Hiron
Advisor
Australian Energy Market Commission
Level 6
201 Elizabeth St
Sydney NSW 2000

Lodged online via www.aemc.gov.au

Re Primary Frequency Response Rule Changes – Consultation Paper

Dear Ben,

Neoen welcomes the opportunity to respond to the AEMC's consultation paper regarding Primary Frequency Response rule changes (19 Sept 2019).

Neoen is one of the world's leading independent producers of renewable energy. Neoen is a responsible company with a long-term vision that translates into a strategy seeking strong, sustainable growth. We have over 2 GW of projects globally in operation and under construction, including in the NEM: Hornsdale Wind Farm (309 MW in SA); Parkes, Griffith, Dubbo, and Coleambally Solar Farms (combined 255 MW in NSW); Bulgana Green Power Hub (hybrid wind/battery system) and Numurkah Solar Farm (combined 314 MW in VIC); and the Degrossa Hybrid Power System (10.6 MW in WA). Neoen is also the owner of Hornsdale Power Reserve (100 MW/129 MWh battery system) in SA.

Summary

Neoen acknowledges that a PFR management system is required within the normal operating frequency band. Neoen supports the establishment of both an interim immediate and long-term primary frequency control framework.

Nevertheless, Neoen believes the creation of a mandatory PFR requirement on all generators does not constitute the most appropriate answer to the immediate issue. Neoen believes direct contracting would be more cost effective and would better recognise the generators who are best placed to respond to local frequency deviations at lowest cost.

Finally, **Neoen is strongly concerned about the negative impact of implementing mandatory PFR requirements on the development of new technologies, particularly batteries, which could be able to offer PFR service with highest quality standards (speed and accuracy).** Based on our analysis, it is very likely that unpaid mandatory PFR will substantially reduce highly needed incentives to invest in firming capacities such as batteries and pumped hydro. In effect, under the current proposal, these assets would be the first to contribute but would not extract any value from their high-level contribution.

Neoen requests 1) an in-depth assessment of how PFR would be operationally managed in interaction with already existing tools including FCAS Regulation and Contingency 2) the simultaneous creation of a Fast Frequency Response market that recognize the value of FFR.

Topics

Frequency issue and solution

Neoen strongly agrees that narrow dead band primary frequency response (PFR) is the required solution to improve NEM frequency stability within the normal operating frequency band (NOFB).

Mandatory PFR is only one of several proven methods of procuring the service. Neoen believes the other approaches should be favoured as we expect them to be more efficient both from operations and costs perspectives. For example: market dispatch of regional reserves, and portfolio level procurement.

Defining frequency control requirements

AEMO's requirement for PFR from all generators does not stem from a particular need, but the idea that spreading the load minimises the cost to any one generator. This does, however, maximise the cost of implementation and reduces transparency in operating costs.

Neoen would expect that a first necessary step before implementing a significant rule in urgency would be a quantitative assessment of the requirements and a detailed analysis of the operational interactions between primary frequency control and secondary frequency control. At this stage, it remains quite unclear which capacity is required to provide adequate PFR service on the NEM or at regional level.

Therefore, AEMO should define the speed and magnitude of responses that would stabilise frequency satisfactorily for a range of scenarios. This need can then be procured on a region by region basis.

A relatively small capacity of fast responding plants should be able to dampen frequency deviations, buying time for Regulation services to respond.

For example: the continental Europe (Germany, Netherlands, Belgium, France, Austria and Switzerland) power market shares PFR dispatch, with demand defined as an N-2 outage (currently representing 3000 MW). Taking into account local requirements and interconnections, each country has a minimum amount they must procure, and each generating station has a maximum share they can provide (no more than 5% of total need or 150MW). This limits the risk of any particular outage affecting the delivery of PFR. A similar approach could easily be implemented in the NEM with minimum regional requirements. Since July 2019, the PFR is procured at continental Europe level through a daily auction process (previously weekly auction process).

Urgency

Given the urgency and importance for grid security we believe that **contracting the PFR service from a smaller number of capable generators, with fair compensation, is more expedient than AEMO's proposed approach.** In either case Neoen believes the outcome of the rule change should be labelled Temporary or Interim by the AEMC to indicate that a more in-depth review will be undertaken.

Although there are benefits to having PFR widely distributed, the primary objective should be swift improvement to NEM frequency under normal operations, delivered as economically as possible. Maximising the number of providers maximises the cost of implementation and acquires PFR from generators with poor capabilities or who would be economically impacted by operating in frequency sensitive mode. Distributing the operating costs of PFR amongst the largest number of generators reduces transparency on what these costs are. **There is a proper balance to be found between economic efficiency (minimising the number of PFR providers) and system reliability (maximising this number).**

Contracting for PFR services allows for the reserve of headroom, increasing the likelihood of consistent PFR provision. This solution also provides flexibility in managing such headroom. Given that rooftop solar and legacy model wind farms will not be able to provide PFR, when these sources are producing at high levels it will drive thermal generators to minimum load where they will also have limited ability to provide PFR. We are already experiencing these conditions in QLD and SA and must consider the procurement of PFR under a wide range of conditions and capabilities.

Regional Reserves for Contingency

Neoen disagrees that PFR should be used to protect against non-credible contingencies like the QNI separation event in 2018. The dispatch of Contingency services in that situation would have provided the required protection against uncontrolled frequency rise. In this situation AEMO already have the tools available to dispatch Contingency, indeed this is currently the approach to managing credible separation of SA. The reclassification of non-credible events is a separate issue to the decline in frequency stability during normal operations.

Implementation of spot market for PFR services

As an alternative solution better suited for the medium-term challenges that the grid will be facing, Neoen supports a spot market for PFR services to allow for the varying capabilities of plant to respond to frequency. With an aging coal fleet heading for retirement, and inconsistent PFR capability from wind and solar, we will need storage to provide this crucial service. However, Neoen is strongly preoccupied with the fact that the mandatory PFR proposal is a strong disincentive to building new batteries as it increases utilisation without payment – an opportunity cost related to the battery's reduced participation in other markets. The opportunity cost for generators has not been accounted for in the proposal.

Mandatory unpaid vs. market approach

The AEMC has highlighted various approaches to remunerating for PFR services. The UK's experience with short term contracts could be swiftly applied to the NEM, buying time for an in-depth review of how we should best procure PFR. **AEMO should specify the magnitude of response expected within the NOFB. Then that capacity can be bought via auction, with more responsive plant able to offer a larger portion of rated capacity into the auction.**

In requiring a broad application of PFR AEMO have reduced the minimum standards for PFR so many generators will be able to meet them. This will drive more responsive generators to reduce their capabilities, so they do not end up doing the heavy lifting. Nevertheless, how do we assure

it will be an efficient response to frequency rapid variations? If we have many generators providing PFR as late as 10 seconds will frequency be greatly improved? The existing issue with Regulation FCAS is that the delay in communications does not provide the ability to respond to rapid changes in frequency. Conversely, if generators are required to operate at their maximum responsiveness for PFR the economic burden on responsive plant is greatly increased. Neoen expects most responsive assets such as batteries will have to bear most of the operational load and will be strongly impacted while slow responsive generation will see little of no consequence. While AEMO proposal does not require generators to keep headroom for providing the service, how such headroom can be defined for a battery? **Mandatory PFR would then results in strong negative impact on existing batteries operations and revenues and create a massive disincentive for new batteries investment in the future.**

Moreover, mandatory PFR increases the risk that peaking plant are unable to cover their contracts during a price spike. Neoen has previously observed non-scheduled generation increases after a price spike that have resulted in costs due to a reduction in generation from responding to the resulting frequency rise. This effect would be enhanced by a tighter dead band.

In summary, here are the following main characteristics we could expect from the different options for implementing PFR in the NEM:

Mandatory

- Highest implementation cost
- High operating and opportunity costs
- Costs are not transparent, neither is their recovery
- Lowest wear and tear on individual units (excluding batteries)
- Service is resilient to single unit failure
- Large amount of service procured (too large?)
- No headroom guaranteed

Contracting

- Transparent costs
- Low or no implementation costs
- Modest ongoing costs – more than the operating cost, less than the opportunity cost
- Resilience to single unit failure to be managed by number of contractors and regionalisation
- Flexible headroom management

Spot Market

- Transparent price
- Low or no implementation cost

- Price reflective of opportunity cost
- Potential for volatility
- Can vary dispatch between generators at short notice
- Can vary procurement volumes at short notice

Neoen believes the best approach is a spot market for PFR with a secondary contract market, as this provides AEMO with dispatch flexibility in all conditions and a reduced ongoing cost.

In case a spot market is not immediately achievable, contracting is a simple, quick, and effective bridge to a market approach.

Neoen welcomes further discussions at the AEMC's behest.

Should you have any questions or seek to follow up this submission at any time, please feel free to contact the Neoen Energy Management team via email at ema@neoen.com.

We look forward to engaging with the AEMC and stakeholders further on this and future reviews.

Kind regards,



Tom Geiser,
Senior Market Manager,
Neoen Australia