Australian Government
Australian Renewable Energy Agency

ARENA

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Primary Frequency Response Incentive Arrangements Rule Change
Australian Energy Market Commission
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ARENA submission to Primary Frequency Response Incentive Arrangements Rule Change - Revised Direction

ARENA has welcomed the opportunity to contribute to this workstream through the technical working group process and through its funding of the Australian Energy Council's Double Sided Causer Pays Studies that has helped paved the way for the AEMC's revised direction.

In summary, ARENA strongly supports:

- the introduction of incentives arrangements for primary frequency response (PFR) that will ensure that tight frequency performance can be maintained regardless of the future generation mix, and
- the inclusion of incentives to allow otherwise unscheduled loads to opt into the provision primary frequency response to reduce their contribution to scheme cost recovery. This will encourage greater participation by distributed energy resources (DER) as they become more capable in the future.

Key issues

As the Commission has noted, the current mandatory PFR arrangements have been effective in restoring a narrow band of frequency deviations under normal operating conditions. This has reduced the risk of frequency excursions and, over time, could reduce the cost of regulation and contingency FCAS for consumers. The mandatory arrangements are, however, heavily reliant on turbine generators that have inherent stored energy (in the form of steam pressure) and so are unsustainable as we transition to much greater instantaneous shares of inverter based generation that do not have this characteristic. While inverter-based resources are capable of

providing a quality frequency response, it requires them to maintain headroom in the form of inverter power transfer capacity, ‘spilled’ electricity, or stored energy (in the case of battery storage). As batteries are only required to participate when they are actively charging or discharging, this means they are unlikely to provide this service for much of the time.

The design of the incentive should consider that generators face different costs to provide these services and flexible incentives arrangements being proposed by the Commission, and that it is in the best interest of consumers to ensure that the lowest cost mix of resources is used at any time. They should also ensure that the largest possible fleet of resources is available to respond during normal operation or contingency events, increasing the resilience of the system. More geographically distributed response should, overtime, reduce the requirement for region-specific procurement of regulation FCAS further reducing costs to consumers.

ARENA is particularly supportive of the proposal that would allow the demand side of the market to share in the cost and benefits under a primary frequency response incentive arrangement. Unscheduled loads are likely to emerge as a major driver of frequency stability. A simple and striking example of this could be large (>1GW) aggregated behind-the-meter EV charging loads controlled to cease charging during a dispatch interval during a high-frequency period. Such events could be quite common and lead to substantial frequency variations either within the NOFB or even lead to major contingency events. Such aggregated loads could grow to >1GW.

Under the proposed arrangements, we understand that frequency performance payments would be made to market participants who have positive contribution factors and the costs of frequency performance payments would be recovered by market participants when they achieve a negative contribution factor. We understand that unscheduled loads would carry a proportionate share of cost of the provision of primary frequency response and it is proposed that flexible loads could minimise these costs by installing appropriate fast metering and demonstrating that they are making a positive contribution to frequency stability. While ARENA agrees that larger loads are most likely to participate in the near term, consideration should also be made to how smaller loads, aggregated as an Integrated Resource Provider, could participate. This could result in a major share of frequency response services in the future being provided by multi-GW fleets of EVs or other flexible demand side resources.

About ARENA

The Australian Renewable Energy Agency (ARENA) was established in 2012 by the Australian Government. ARENA's function and objectives are set out in the *Australian Renewable Energy Agency Act 2011.*

ARENA provides financial assistance to support innovation and the commercialisation of renewable energy and enabling technologies by helping to overcome technical and commercial barriers. A key part of ARENA's role is to collect, store and disseminate knowledge gained from

the projects and activities it supports for use by the wider industry and Australia's energy market institutions.

Please contact Jon Sibley, Principal Policy Advisor (jon.sibley@arena.gov.au) if you would like to discuss any aspect of ARENA's submission.

Sincerely

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