

## Notes relating to contribution to CIGRE 2022 Technical Discussion Session for C5, PS1 – Question 6

The Special Reporter posed the following question:

***Are other jurisdictions experimenting with the potential for wind and solar (including distributed PV) providing ancillary services directly or via aggregators? Are there existing business cases for this? Is hybridisation a viable option?***

From August 2017 to February 2018 the Hornsdale Wind Farm 2 (HWF2) trial<sup>1</sup> was the first in-market technical demonstration of a wind or solar farm providing frequency control ancillary services (**FCAS**) in the Australian National Electricity Market (**NEM**). This proof-of-concept trial confirmed that inverter-connected wind plant can provide some frequency control services in accordance with the requirements of the Market Ancillary Service Specification (**MASS**).

A further trial from March 2020 to May 2021 at Musselroe Wind Farm<sup>2</sup> (**MRWF**) aimed to demonstrate the ability of an existing wind farm with Vestas turbines to deliver FCAS and summarise the commercial and economic assessment of wind farm participation in the FCAS market. The final public report<sup>3</sup> highlighted that;

- FCAS capability has been successfully enabled on MRWF.
- Given some of the existing wind curtailment issues on site at MRWF, ‘filling’ a storage device (and providing FCAS capability) is a technically plausible and economically viable option.
- In the preliminary business case model runs, several configurations’ options have been considered and appear economically feasible.

The final public report also highlighted the feasibility of a wind/battery hybrid facility. It was noted that the addition of a battery energy storage system (**BESS**) would assist MRWF in the delivery of FCAS, in particular contingency services.

A recent trial in Southern Tasmania, the Bruny Island Battery Trial<sup>4</sup> (**BIBT**), involved the hybridisation of aggregated solar and battery services. BIBT used the aggregated services to provide network peak load support, ensuring network capacity was not exceeded. Whilst the provision of ancillary services was not within the scope of this trial the hybrid aggregated services were able to dispatch both import and export energy to the network, highlighting potential participation in the FCAS market and additional business case benefits.

In summary, with numerous wind and solar aggregators registered with the Australian Energy Market Operator to provide ancillary services across all jurisdictions of the NEM there is no doubt that there are positive benefits for inclusion in a business case. Further, the MRWF trial has shown that whilst wind farms can provide FCAS on their own there are added advantages of hybridisation, such as the addition of a BESS.

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<sup>1</sup> <https://arena.gov.au/assets/2017/07/aemo-hornsdale-wind-farm-fcas-trial-report.pdf>

<sup>2</sup> <https://arena.gov.au/assets/2021/09/mussleroe-wind-farm-provision-of-fcas.pdf>

<sup>3</sup> <https://arena.gov.au/assets/2022/02/musselroe-wind-farm-public-report.pdf>

<sup>4</sup> <https://brunybatterytial.org/>

Table 1 - List of Wind and Solar market participants

Participant	Station Name	Region	Generation Type
<b>Enel X Australia Pty Ltd</b>	ENOC MASP NSW	NSW	Embedded Network Operator Customer
<b>Energy Locals Pty Ltd</b>	VPP Energy Locals NSW 2	NSW	Virtual Power Plant
<b>sonnen Australia Pty Limited</b>	VPP sonnen NSW 1	NSW	Virtual Power Plant
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<b>Enel X Australia Pty Ltd</b>	ENOC MASP QLD	QLD	Embedded Network Operator Customer
<b>Hydro-Electric Corporation</b>	VPP HT QLD 1	QLD	Virtual Power Plant
<b>AGL South Australia Pty Ltd</b>	VPP AGL SA 1	SA	Virtual Power Plant
<b>Discover Energy Pty Ltd</b>	DiscoverEnergy VPPSA	SA	Virtual Power Plant
<b>Enel X Australia Pty Ltd</b>	ENOC MASP SA	SA	Embedded Network Operator Customer
<b>Energy Locals Pty Ltd</b>	Energy Locals SA VPP	SA	Virtual Power Plant
<b>Energy Locals Pty Ltd</b>	VPP Energy Locals SA 1	SA	Virtual Power Plant
<b>HWF 2 Pty Ltd</b>	Hornsedale Wind Farm 2	SA	Wind
<b>HWF1 Pty Ltd</b>	Hornsedale Wind Farm	SA	Wind
<b>HWF3 Pty Ltd</b>	Hornsedale Wind Farm 3	SA	Wind
<b>Shine Hub Pty. Ltd.</b>	VPP ShinHub SA 1	SA	Virtual Power Plant
<b>Simply Energy</b>	VPP Simply SA 1	SA	Virtual Power Plant
<b>Hydro-Electric Corporation</b>	Musselroe Wind Farm	TAS	Wind
<b>Enel X Australia Pty Ltd</b>	ENOC MASP VIC	VIC	Embedded Network Operator Customer
<b>Energy Locals Pty Ltd</b>	VPP Energy Locals VIC 2	VIC	Virtual Power Plant