Australian Government
Australian Renewable Energy Agency

ARENA

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Australian Energy Market Operator

By email: eges@aemo.com.au

GPO Box 643
Canberra ACT 2601
Tel: +61 2 9243 7773
ABN: 35 931 927 899
www.arena.gov.au

ARENA Submission in response to AEMO's Consultation on Emerging Generation and Energy Storage

This submission provides information regarding the Australian Renewable Energy Agency's (ARENA) role in the energy sector and insights gained through projects funded by ARENA as relevant to AEMO's consideration of market registration categories for standalone energy storage and hybrid energy systems.

About ARENA

ARENA was established to make renewable energy solutions more affordable and to increase the supply of renewable energy in Australia.

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.

A summary of current relevant ARENA supported projects is at Attachment A.

ARENA's interest in the AEMO proposal

ARENA has a strong interest in ensuring the rules and procedures that underpin the National Electricity Market are able to accommodate emerging energy technologies and services and allow for commercial innovation. It is important any new framework for registration provides flexibility for different commercial models and works to encourage new investments that strengthen the power system.

ARENA supports AEMO's work to reform market registration categories to accommodate standalone storage and hybrid energy systems. ARENA also agrees with AEMO that of the registration categories presented, Option 2a (Resource Provider Registered Participant), which is the most technology neutral performance-based approach, will provide the most efficient and durable solution.

Long term drivers of reform

ARENA sees significant potential for wind, solar and energy storage to increase across all sectors including in 'behind-the-meter' (BTM) applications. Bloomberg predicts that the rate of commercial and industrial PV installations will exceed residential uptake in the mid 2020s with over 25 GW of BTM industrial PV installed by 2050[1]. Combined with more ubiquitous demand response, this has the potential to contribute to a more dynamic and less predictable demand side that will have implications for AEMO's approach to operating the power system. This trend will necessitate new approaches to market participation of both generators and loads to make supply demand balances more forecastable and to reduce the costs associated with maintaining frequency regulation and any emergency energy reserves.

Across the electricity sector there is a growing appreciation of the equivalences between demand side and supply side energy services and consideration of a more symmetrical system of incentives and obligations. Supporting this, demand response is playing an increasing role in frequency control and under the Reliability and Emergency Reserve Trader mechanism. Demand response is also increasingly being considered a tradable hedge commodity for electricity retailers and was specifically provided for as an eligible hedge product under the reliability obligation mechanism under the National Energy Guarantee. An increasing range of customers are getting to access spot prices through new retail products. While the current wholesale demand response rule change processes may result in demand response participating directly in electricity spot markets, potentially making demand response schedulable, this is likely to represent only a percentage of overall BTM flexibility. Under AEMO's proposed registration framework for standalone energy storage and hybrid generators, ramp rates and other performance standards would be applied similarly to generation and load further demonstrating the growing equivalence of generation and load reduction.

ARENA considers the long-term theoretical conclusion to a technology neutral, performance-based approach to market registration may be a simplified market designed around a single category of participant, that self-forecasts, bids and is scheduled variably in positive or negative amounts. This could be supported by performance-based, decentralised approaches to managing for system security such as the deviation pricing approach described in Appendix A to AEMC's Frequency Control Frameworks Review Final Report[2]. Such approaches could reduce the costs of achieving system security in a future electricity grid characterised by high penetrations of low-cost variable renewable energy generation, energy storage and a more dynamic demand side. We note the potential for the current joint ARENA-AEMO short term forecasting trial to continue developing knowledge and experience that would inform practical viability of this type of approach.

Future collaboration

ARENA considers the approach being taken by AEMO is fit-for-purpose in the context of the issues currently facing proponents of stand-alone energy storage and hybrid generation

[1] Bloomberg New Energy Outlook, 2018

[2] https://www.aemc.gov.au/sites/default/files/2018-07/Final%20report.pdf

systems. We also think it is useful to situate these changes in the context of longer term trends which may call for more profound changes to rules and procedures in the future.

Our ARENA-AEMO MOU provides for close collaboration on proof-of-concept demonstrations and knowledge sharing activities across a range of areas. We would welcome the opportunity to build on the the success of collaboration projects to date and explore the potential for leveraging existing projects or further projects in this space.

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

Yours sincerely

Darren Miller

Chief Executive Officer

<u>Attachment A</u> - ARENA supported energy storage system and hybrid projects at various stages of feasibility assessment or development

Project	Parties	Configuration	Type
ESCRI	ElectraNet / AGL	30MW / 8MWh	Energy storage system
Gannawarra	Edify	25MW / 50MWh	Energy storage system
Ballarat	Ausnet / Spotless	30MW / 30MWh	Energy storage system
Lake Bonney	Infigen	25MW / 52MWh	Energy storage system
Kidston	Genex	250MW / 2000MWh	Energy storage system
Battery of the nation	HydroTas	14 projects in Tasmania	Energy storage system
Shoalhaven	Origin	475MW	Energy storage system
Cultana	Energy Australia	225MW / 1770MWh	Energy storage system
Snowy 2.0	Snowy Hydro	2GW / 350GWh	Energy storage system
Gannawarra	Edify / Wirsol	Solar: 50MW Battery: 25MW / 50MWh	Hybrid generation projects
Lake Bonney	Infigen	Wind: 279MW Battery: 25MW / 52MWh	Hybrid generation projects
Gullen Range	Goldwind	Wind: 165.5MW Solar: 10MW	Hybrid generation projects
Kennedy	Windlab	Wind: 43MW Solar: 15MW Battery: 2MW / 4MWh	Hybrid generation projects
Kidston	Genex	Solar: 50MW PHES: 250MW / 2000MWh	Hybrid generation projects
Emu Downs	APA Group	Wind: 80MW Solar: 20MW	Hybrid generation projects
White Rock	Goldwind	Wind: 377MW Solar: 20MW	Hybrid generation projects
Lakeland	Conergy	Solar: 13MW Battery: 1.4MW / 5.3MWh	Hybrid generation projects