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Australian Energy Market Operator
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Australian Energy Storage Alliance Response to Draft ISP

The Australian Energy Storage Alliance (AESA) is an independent advocate and information hub, whose mission is to advance the role of clean, safe and reliable energy storage solutions in Australia and Oceania. The AESA represents views presented by participants of the group on issues relevant to the uptake of energy storage solutions.

The AESA supports the development of a 2020 Draft Integrated System Plan (ISP) as an important resource and a guideline for developers and investors of energy storage in the NEM.

However, concerns have been raised by a number of our members regarding the narrow focus of the current 2020 draft plan on specific energy storage technologies. In particular, these concerns relate to the lack of large-scale battery storage (BESS) projected over the next two decades as indicated in the draft ISP.

The AESA welcomes this opportunity to provide feedback received on these aspects of the ISP and has received the following comments and input for AEMO's consideration.

Dr Lachlan Blackhall, Head of the Battery Storage and Grid Integration Program, at the Australian National University (ANU) supports "a technology-neutral, least-cost approach to the future planning of the electricity system." He adds that "from a generation perspective, this least cost approach will mean a significant amount of new wind and solar generation, as captured by the most recent CSIRO GenCost report." Lachlan also notes that "to ensure energy reliability and energy security in a high-renewable electricity system there is a need for significant amounts of energy storage."

In determining the least-cost portfolio of energy storage, Dr Blackhall emphasises that "it will be important to ensure that the value of storage flexibility is incorporated into the cost assessment". He further notes that the "least-cost assessment of the energy storage portfolio should recognise the additional value that may be realised by energy storage participating in markets for energy, ancillary and network services."

Dr Blackhall notes that in this context "we would expect to see significant uptake of distribution-connected battery storage installed in front of the meter." As an example, he

cites “the increasing opportunities for community and suburb scale energy models including battery storage that are currently being investigated by the ESB and through several ARENA-funded projects. In these models, there may be several additional revenue streams that hasten the reduction in the effective costs of distribution connected battery storage as compared to other forms of energy storage like PHES that will typically be transmission connected.”

Tesla Motors Australia (Tesla) has provided the following comments. “Given grid-scale BESS assets have already demonstrated their competitiveness against other assets that are being substituted in the ISP modelling, Tesla recommends AEMO re-open its inputs and scenario assumptions for sensitivity testing.”

Tesla adds, “In addition, AEMO should be agnostic on storage technologies and instead present storage outcomes based on proposed roles (e.g. characteristics rather than technology types) to ensure technology neutrality – letting the market decide based on real-world value potential. AEMO should define storage as a single category (and not split out batteries from pumped-hydro at the grid scale). This will ensure the market drives suitable investment decisions without prejudice from ISP forecasts.”

A further comment from Tesla expresses concern about highlighting a preference for particular storage technologies, and notes that, “the Draft ISP does consider non-network alternatives, however only PHES is mentioned. In practice, we are already seeing RIT-T assessment of grid-scale battery storage as non-network alternatives.”

Fluence, technology supplier for AusNet Services’ 30 MW Ballarat energy storage project, provided comments on the additional services that could be valued from large-scale BESS.

"Fluence believes it is important to model in multiple revenue streams the BESS can stack to evaluate its net benefit to the system. For example, when the least-cost model determines if a BESS can be built, it should factor in multiple value benefits of energy shifting, Synthetic Inertia, Transmission augmentation and value of Frequency regulation. Our understanding is only one application is modelled in when the forecast determines new builds. This may be a significant omission that impacts the LCOE of a BESS in the least-cost modelling. In addition to this, to include the benefits of Large-Scale Batteries the integrated model would need to factor in the least cost benefits of each technology in conjuncture with other dynamic inputs:

- transmission constraints but also the ability to optimize transmission requirements with the benefits Large- Scale Storage can bring as virtual transmission lines with lower cost upgrades in the near term (right sized for the requirement) and at a quick rate of deployment. Additionally, Large-Scale Batteries can be positioned near renewable generation to provide services and potentially improve the MLF of a plant.
- The Ancillary Services market and benefits from supporting synthetic inertia”

The ISP and GenCost study seem to be missing a 1-hour duration battery, which has proven cost-effective in Australia for frequency regulation and other system security services. Including this valuation would make clear in the ISP’s the near-term outlook the significant value battery-based storage offers to support required system reliability.”

Matthew Pellow of Pellow Energy Insights has provided the following from his knowledge of the uptake of large-scale BESS in USA and he makes the added point about spreading the risk for an investor.

Matthew comments that: "In an interesting counterpoint to the 2020 Draft ISP, a number of utility companies in the U.S. have recently selected lithium ion batteries over pumped hydro storage when determining lowest-cost roadmaps to meet forecast system seeds in their recent integrated resource plans.[1] The integrated resource plan (IRP) for a U.S. electric utility is similar AEMO's ISP in some important respects: it considers system needs over a 10-20 year time horizon, and determines lowest-cost pathway for the utility to meet the forecast system needs. Examples include the electric utilities that serve New York City, Los Angeles, and parts of Colorado, North Carolina, and Arizona.

Pumped hydro storage tends to be most cost effective at a much larger scale. A significant financial commitment is therefore required in order to cost-effectively develop pumped hydro storage capacity. In contrast, battery energy storage can be cost effective in installations of under ten megawatts. (Recently completed lithium ion battery systems typically range in size from less than 10 MW to around 100 MW, and several systems of several hundred MW are in development.) Generally speaking, when using battery technology, a large capacity of energy storage can be deployed in smaller increments than if pumped hydro is used, and therefore may potentially require smaller increments of capital commitment and entail smaller increments of project risk."

In summary, while the projections in the ISP are useful, the AESA sees that limiting technologies based on current costing and abilities is counter-productive and may discourage investment. A final comment comes from Samantha McGahan of VSUN Energy who commented that "the market should choose the technology that best fits".

This AESA submission is an overview of the some of the concerns of those in the energy storage Industry who responded to AESA's request for comment. By providing this snapshot of views, the AESA hopes to ensure that the final 2020 ISP plan will demonstrate that it is flexible to adapt to both the current and future range of energy storage options.

Kind Regards

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1 *Pumped Storage Hydro in Resource Planning in the United States: A Survey of Recent Results and Methods*. EPRI, Palo Alto, CA:2019. 3002015414.