

24 June 2024

Department of Climate Change, Energy, the Environment and Water (DCCEEW)
NSW Government
Via email: lds.review@dpie.nsw.gov.au

RE: Long Duration Energy Storage Review

Dear Madam/Sir,

Squadron Energy welcomes the opportunity to respond to NSW DCCEEW's Review of Long Duration Storage (LDS) requirements in NSW.

Squadron Energy is Australia's leading renewable energy company that develops, operates and owns renewable energy assets in Australia. We have 1.1 gigawatts (GW) of renewable energy in operation and an Australian development pipeline of 14GW. Our development pipeline has projects at differing stages of development and includes wind, solar and firming capacity such as batteries and gas peaking plants with dual fuel capability. With proven experience and expertise across the project lifecycle, we work with local communities and our customers to lead the transition to Australia's clean energy future.

We are supportive of the NSW Government's commitment to delivering the NSW Electricity Infrastructure Roadmap and acknowledge LDS as critical for meeting medium to longer-term reliability needs.

Stronger signals and alternative incentives are needed to support longer duration storage and solutions to meet firming and reliability needs

In principle we support the proposed change to a 4-hour minimum duration in the definition of LDS under the *Electricity Infrastructure Investment Act 2020 (EII Act)*. However, we remain uncertain of forecast storage infrastructure requirement for portfolios built largely on 4-hour batteries and consider that the system need for some storage longer than 4-hours will be a more likely outcome. As the AEMO Services' (ASL) advice to the NSW Government identified, there are assumptions in the existing reliability assessment methodologies that may lead to the underestimation of the value of longer-duration storage in mitigating tail-risk.¹ It is therefore probable that future reliability risks are more significant when forecast limitations are included. Put another way, the duration of unserved energy events (USE) is likely to be greater than expected - particularly if recent patterns of renewable energy droughts and unforced outages of coal plants persist. We can see this reflected in the Reliability Panel's *Review of the reliability standard and administered price cap* which showed a mean USE duration was 7 hours at 75% variable renewable energy (VRE) whereas ASL modelling shows 63% of USE at 4 hours or below in 2030.

This uncertainty in the duration of USE events underscores the importance of market and policy settings that support a diversity of solutions to meet the firming and reliability needs of a high VRE grid. The need to encourage greater technological diversification to meet NSW's needs was core to the Electricity Supply and Reliability Check Up (the Check Up) recommendation yet the proposed change in the Long Duration Energy Storage Review may inadvertently reduce the diversity of solutions and technologies (e.g. by narrowing incentives to focus on shorter duration storage in a market currently dominated by Lithium-Ion batteries). Accelerating shorter duration uptake to meet NSW's 2GW LDS target is, in part, a practical solution as increasing shorter duration storage solutions overall is a better outcome than having limited LDS solutions

¹ The Electricity Statement of Opportunities (ESOO) methodology makes several optimistic or idealised assumptions regarding a range of circumstances that affect system operation, with implications for unserved energy, including planned or unplanned transmission/generation outages, renewable droughts and/or early retirement of coal generators.

pre-2030. In the medium to longer-term, the overarching concern for Squadron remains whether system reliability needs can be met by shorter duration batteries alone and the subsequent cost implications of this approach to overbuild smaller capacity storage units rather than deepen storage. If the definition of LDS is changed to a 4-hour minimum, then the NSW Government also needs to:

- adopt the ASL recommendation to provide greater decision-making flexibility in LDS tendering processes so that longer duration storage can be valued for its reliability contribution over time and as to not undermine its viability.
- consider additional policies and programs to support greater technological diversification and incentivise other longer duration firming and storage solutions.

Other ways to incentivise LDS and support reliability outcomes during the transition

Longer-duration projects have the potential to mitigate tail-risks to reliability, however are not likely to be incentivised under current market frameworks in the absence of a strong signal or a direct program. This section sets out several potential options under the EII Act that could be considered to incentivise more diverse forms of technologies to meet the systems immediate and future reliability needs.

Changes to the requirements of Long-term Energy Service Agreements (LTESA) to support investment certainty in LDS

As discussed above, one potential option is to include greater decision-making flexibility in LDS tendering processes so that longer duration storage can be valued for its reliability contribution. Any change to this effect needs to ensure adequate transparency around how LDS is valued relative to other technologies. This will require an acute focus on how prices are set for medium-and long-term storage given the existing 'missing-money' issues under the current energy-only market design.² Consideration also needs to be given to if and/or how LDS can be valued differently in LTESA tenders to ensure alignment with the core objectives of the EII Act.

Another potential adjustment to the LTESA requirements to support LDS uptake could include expanding what is considered as eligible beyond pumped hydro and chemical batteries. The current definition under Part 6, Division 1, Section 43 (1)(b) of the EII Act characterises LDS as only relating to the storage of electricity. Expanding this definition to capture broader sources of storage would enable a wider range of possible LDS technologies and fuel sources capable of being stored and utilised for dispatchable electricity generation (such as hydrogen, ammonia, or biofuels).

The contribution of LDS to maximising the capacity of existing network infrastructure and providing storage can be enhanced

LDS, like many forms of storage, can reduce the technical curtailment of renewables if they are well located in the network. In the context of significant transmission infrastructure delays, there is the potential to uplift the overall transfer capacity of the network through utilising storage as a form of virtual transmission. This can improve the ability to manage power flows through the network and would enable the system to be designed to meet N-1 contingency in addition to any storage capacity. We consider that like the utilisation of the Waratah Super Battery (WSB) under the NSW's System Integrity Protection Scheme (SIPS), there is the potential to utilise LDS technologies to ensure constrained parts of the network are capable of operating at full capacity in the event that there is a sudden shock to the system or one of its lines is out of service. Importantly, the WSB project is being delivered as a Priority Transmission Infrastructure Project (PTIP). The ability to declare PTIP projects is a key mechanism within the EII Act that can be utilised to

² 'Missing money' is used here to describe barriers to accessing energy market revenue opportunities, meaning medium to long-duration storage cannot fully recover its costs.

address both the related challenges of bringing on more LDS and enhancing the transfer capacity of the existing network considering transmission delays, both of which will support better reliability outcomes. We therefore encourage further consideration of key areas of the network that can be enhanced by LDS and the potential for the PTIP mechanism to be utilised to support its delivery.

We look forward to the opportunity to continue to support the rapid uptake of renewable generation. If you would like to discuss this submission or any related content, please contact Rupert Doney, Director - Policy at [REDACTED]

Yours sincerely,



Graham Denton
Head of Energy Markets
For and behalf of Squadron Energy Services Pty Ltd