

NSW Department of Climate Change, Energy, the Environment and Water

By Email: lds.review@dpie.nsw.gov.au

Re: ZEN – LDS Review Consultation Feedback

ZEN Energy (ZEN) is actively developing a gigawatt-scale pumped hydro project, the Western Sydney Pumped Hydro Project, targeted to come online in the early 2030s.

We welcome the opportunity to comment on the review of the long-duration storage (LDS) definition in relation to how it operates under the Long-Term Energy Service Agreements (LTESA).

About ZEN Energy

ZEN is the first electricity retailer in Australia to have a near-term, science-based emissions reduction target in line with limiting global warming to 1.5°C.

ZEN has brought together a community of sustainability-driven customers (governments, businesses, industries, and residents), renewable energy suppliers, and capital partners. Some of our key customers include the South Australian Government, CSIRO's sites in NSW, Victoria, and the ACT, and the Southern Sydney Regional Organisation of Councils (SSROC), comprised of 25 local councils.

ZEN has contracted renewable energy and environmental certificates from 25 solar and wind farms, and is actively growing its firm renewable energy supply. ZEN has just commenced construction on the 111 MW/291 MWh Templers BESS in South Australia, and is progressing a development pipeline of storage and generation assets across the mainland National Energy Market (NEM).

As an electricity retailer, ZEN provides long-term contracts to its customers, typically of 10 years. Its customers do not directly see wholesale electricity market conditions, they see a risk-managed product through ZEN's electricity portfolio. ZEN perceive the biggest price risk to customers (and consumers more broadly) as being prolonged wind droughts over winter and the high reliance on gas-market coupling that results during these periods. Suitable LDS is the true mitigant to this risk for consumers, particularly longer duration pumped hydro, sized and designed to blunt both price volatility and its duration.

Key feedback on the Long Duration Storage Review

1. What is the minimum duration for long duration storage infrastructure in NSW for 2030?

The minimum duration for classification as LDS should remain at no less than 8 hours. Increasing the minimum duration beyond 8 hours is also worth considering; however, the benefit of longer duration can more simply be considered as a merit criterion in future LDS assessment rounds. Future LTESA Firming tenders can continue to focus on shorter duration storage (2-4 hour), with technologies able to be quickly deployed to address forecasted reliability gaps.

The state's Electricity Infrastructure Roadmap (Roadmap) committed to providing the industry with greater investment certainty. The LDS LTESA, combined with EnergyCo's Pumped Hydro Recoverable Grant process, was designed to support the industry's investment in developing long-duration storage projects, particularly pumped hydro. The LDS LTESA tender was originally intended to provide LDS investment to replace coal

closures. Industry followed government policy in targeting projects that could provide at least 8 hours' duration.

This resulted particularly in pumped hydro projects. These projects are the most mature alternate storage technology to batteries, and are competitive specifically for durations longer than 8 hours. Pumped hydro also has a greater ability to match the retiring inertia and system-strength contribution of synchronous thermal generators than asynchronous short-duration batteries. The other positives of pumped hydro projects are their high local content and substantially lower greenhouse gas emissions over a life cycle than battery storage technologies.

The LDS LTESA provides a level of comfort (and a clear market signal) that a well-developed, logical, pumped hydro project (or other well-conceived long-duration storage project) can receive a government underwrite to support its financial model, and ultimately be financed and constructed. Removal of that market signal will send the wrong message to industry at a time when a range of reputable parties are independently concluding that LDS has an important role to play in the future energy system. Examples include:

1. AEMO's draft 2024 ISP notes that: "forecasting both energy demand and weather can never be perfect. It is prudent to provide a buffer of deeper solutions to add resilience against known yet unpredictable risks. Market and policy settings will need to evolve to enable deep storage solutions with cost recovery mechanisms that are not limited to actual use."
2. The Reliability Panel conducted a review of the reliability standard in April 2024, and found 75% VRE penetration in the NEM would increase the mean unserved energy event (USE) duration to seven hours. This is different to AEMO Services' modelling which states that 63% of USE events will be less than four hours in 2030.
3. Simshauser et al¹. highlight the limitations of assuming gas-fired generation will be the backstop firming solution, noting the effects on adjacent gas markets and gas-supply infrastructure. There are prominent gas shortages in winter peak-demand events, with Simshauser modelling showing that including 18hr pumped hydro in the technology mix materially improved gas-supply shortfalls. (These shortfalls were reduced almost five-fold, from 29 PJ to 6 PJ annually.)
4. AEMO Services' own modelling (produced for this review) found near-optimal economic outcomes with assuming some contribution from 24hr NSW pumped hydro (of which there are no current proposals). However, the modelling did not look for more optimum outcomes using durations between 8 and 24 hours (e.g. 10-18hrs). An optimum outcome may well have been found within this range that also provided better protection against reliability tail-risks as directly flagged by AEMO Services.
5. The AEMC has increased the cumulative price threshold (CPT) to 8.5 hours at the market-price cap, and notes that the CPT is expected to continue to increase each year. The AEMC's modelling consultant IES noted that long-duration events (10+ hours) make up a material share of the expected unserved energy volumes – up to 25% in NSW.

The current spot and wholesale markets do not currently reward investment in providing these vital solutions to the electricity market. However, pumped hydro projects play a unique and important role in the future energy system. For industry to be able to continue developing these projects, it is crucial that the minimum duration for long-duration storage infrastructure is not reduced from 8 hours. Rather than altering the LDS definition, the Roadmap should use an existing, parallel mechanism. The Energy Security Target and associated Firming tender rounds can be used to address reliability gaps, with future rounds able to be

¹ [Solving for 'yy': demand shocks from Australia's gas turbine fleet](#) (Paul Simshauser and Joel Gilmore, March 2024; Griffith University)

To be clear, ZEN acknowledges there are roles for both short-and long-duration storage, and that these two separate functions should not compete. Hence, ZEN's suggestion for different tenders.

2. Should the Minister have regulation making powers to change the minimum duration of long duration storage infrastructure over time?

3. How can the infrastructure objectives and LDS tenders be improved to support a diverse range of long duration storage infrastructure?

ZEN agrees with the Review's acknowledgement that the benefits of LDS are not entirely captured in government tenders. The Review specifically cites LDS's capacity to mitigate high-impact, low-probability USE events (referred to as tail-risks), reduce economic curtailment, reduce technical curtailment and avoid costly network solutions.

ZEN recommends the merit criteria assessment in the LDS LTESA Tender be modified to recognise the benefits of LDS. These include:

ZENENERGY

3	Impact on the electricity system	<ul style="list-style-type: none"> Consider 2-3 day duration of renewable-generation shortfall (Impact on Electricity System) Assess long asset life Points for technology diversity needs – system inertia and other system-strength benefits Long-ramping services needed to balance renewables and extended outages
4 (b)	Pathway to commercial operation – securing approvals, network connection, and land	<ul style="list-style-type: none"> Positively assess access to existing network infrastructure and land
6	Community engagement, shared benefits and land use consideration	<ul style="list-style-type: none"> Consider land-use impacts and benefits of brownfield sites using existing infrastructure
7	Regional economic development	<ul style="list-style-type: none"> Reward projects with high local-content contribution Consider macro regional economic development / total investment Consistent benchmarks for PHES pumped hydro and battery storage, as well as consideration of project scale

The latest LDS LTESA extended the contract term for pumped hydro projects to 40 years. This is a good step in the right direction.

4. Should the NSW Government introduce amendments to LDS definition to clarify it can include aggregated LDS infrastructure across multiple sites.

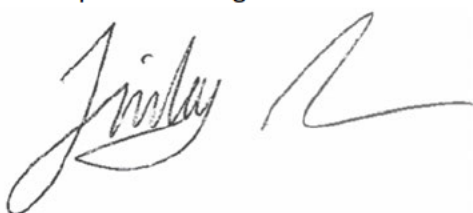
No comment.

Conclusion

ZEN would welcome the opportunity to discuss our submission further. Please don't hesitate to contact [REDACTED] or via phone as noted within my email signature.

Yours Sincerely,

Fin Adamson
Development Manager



18/6/2024