



NSW Department of Climate Change, Energy, Environment and Water

Submission on the Long Duration Storage Review Part 6

The Smart Energy Council welcomes the opportunity to submit on this important 'Review of Long Duration Storage Part 6' by the NSW Department of Climate Change, Energy, Environment and Water.

The Smart Energy Council (SEC) is the peak independent body for Australia's smart energy industry, representing over 1,300 residential, commercial, and large-scale renewable generation and storage companies, smart transport firms, as well as the renewable hydrogen and the ammonia industry. This submission will predominantly Answer Question 1 of the consultation paper: "What is an appropriate minimum duration for long duration storage infrastructure in NSW", however, the paper will also address Question 4 in part at the end of the submission.

The Smart Energy Council supports flexibility in reaching reliability goals to firm the energy grid. The Smart Energy Council supports the objectives of trying to optimize our energy planning and tendering process to deliver for the medium to long term interest of energy consumers. It is an imperative the NSW Electricity Infrastructure Roadmap to adapt to work with the latest technological developments in the industry. Nonetheless, a flexible approach to delivering firmed capacity for NSW cannot come at the cost of clear and consistent investment signals for LDES technology solutions that will provide energy for at least 8 hours. The maintained commitment to solutions which can provide 8 hours of storage is crucial given USE data indications, fast retiring coal plants, the rise of Power flexibility options in the grid, the lack of intra-day storage and the volatility in the transition to renewable energy. 8hr+ LDES needs bespoke support to get built in the absence of a complex

THE INDEPENDENT BODY FOR THE SMART ENERGY INDUSTRY IN AUSTRALIA

PO BOX 231, MAWSON ACT 2607
INFO@SMARTENERGY.ORG.AU
SMARTENERGY.ORG.AU
ABN 32 006 824 148



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capacity market. Furthermore, waiting for the modelling to have identified a LDES gap will likely be too late given the long lead times.

Section 2. Mechanisms to support LDES need to become more sophisticated to reflect current technology capacity.

The Smart Energy Council strongly urges NSW to enable any storage solution in the LDES tenders to stack upon one another in order for shorter batteries which do not meet the LDES 8hour definition to form 8hrs of energy storage virtually, between multiple assets. This would mean that projects, likely batteries, that do not meet the 8-hour duration requirement on their own, could aggregate with others, and reduce their discharge at the appropriate times to become an aggregated LDES that could, between the assets discharge for 8 hours. If this aggregation of the assets only occurred when necessary to meet LDES needs, the remainder of the time the assets could optimise their economic utilisation as projects with far greater power capacity assisting in providing system strength on a shorter-term basis, and thus providing better value to NSW energy consumers.

The critical part of this concept is a trigger or mechanism in the LTESA contract which can, with the appropriate timing amalgamate a series of shorter duration projects to act collectively as an 8hr asset. We accept that this form of contracting innovation will likely require an amendment to the act to enable this innovation. Nonetheless if undertaken, the tenders for LDES could both deliver clear signals for LDES solutions and simultaneously offer flexibility in meeting the firming capacity needed by 2030.

To further elaborate this mechanism could contain a provision that the LTESA payments are conditional upon these shorter duration batteries amalgamating, or holding back from discharge, to become virtual 8hr batteries when needed by the grid.

Short duration does have the advantage of significant power flexibility, which will be useful, perhaps more often over the course of the energy transition. If their power capacity was utilised selectively to meet power needs, it would increase the economic utilisation of these assets, hence reducing the

overall cost to consumers. Nonetheless, this adaptation cannot be at the cost of the original intention of the tender to deliver 8hrs storage solutions.

Section 3. Significant Reliability gaps beyond 4 hours in NSW demand continued bespoke support for 8hr Storage.

Unserved Energy events by 2030 will need significant energy storage beyond 4 hours

According to AEMO 37% of Unserved Energy events (USE) will be more than 4hours in duration in 2030. Without the proper market signals for batteries to draw out their dispatch, the need for 8hr storage is still required to keep the lights on in NSW up to 2030.

The AEMO Services review notes that support for LDES as currently defined is necessary to meet medium to long term energy reliability needs. If investment into LDES is needed in the medium term, then the investment signals must be set clearly today, and with the volatile nature of coal closures it is not an option to push LDES investment signals down the road any longer.

Section 4. The Big Picture

Delivering the Electricity Infrastructure Roadmap

The aim of this policy was to support LDES outside of the general market to meet fundamental needs of the state to achieve its energy transition while keeping the lights on. The purpose of these bespoke tenders is to solve problems set out strategically through a whole of system plan, which recognises the inevitable market gaps and flaws in the rapid construction of a renewable energy system.

To simply adjust the definition of LDES to 4 hours is to deconstruct the original purpose of distinctly supporting LDES as part of a central plan to ensure we transition to renewables while keeping the lights on. The forecasting models will change every review, for what is needed in firming capacity, but support for long lead time LDES cannot be subject to short term market adjustments based off a volatile and ever-changing deployment of VRE.

For example, the energy transition in NSW may deliver a high penetration of renewables faster, from social licence issues become more neutralised and standardised. In this scenario coal retirement will be accelerated and intraday storage will become more pressing sooner than anticipated. Only addressing immediate firming risks in NSW has caused significant issues and is evident in the tax-payer funded delay of the Eraring Coal fired power station closure. The transition to a renewable energy system is too uncertain and volatile to change long term planning objectives, such as distinct support for LDES in the face of incremental changes in forecasted firming capacity. LDES investment signals are in place to insure against volatility in the renewable energy build out, keep the lights on and thus maintain what is fickle social license for a rapid energy transition.

The rise of co-ordinated CER is also likely to reduce the need for KW or power support in the grid, but a maintained requirement for intra-day stability. Discussed below in section 5.

We support the flexibility of AEMO services to provide for energy reliability, but a reduction of permissible projects 4 hours of duration must be accompanied by a trigger or mechanism to hold projects when needed to provide 8hrs of support through an amalgamation of shorter duration projects.

Section 4. The rise of Power Flexibility in the grid

The Smart Energy Council sees Power based flexibility in the grid will increase significantly given the rapid electrification process currently underway in Australia. In light of this change prioritising Power flexibility at the expense of long dispatch is a strategic planning risk. Power flexibility is and must be guided and incentivised through pure market processes. LDES however, is far from any market incentive or signal for support, and therefore LTESA's for LDES need to remain focused primarily on addressing the delivery of a reliable power system as a whole, as envisioned by the Electricity Infrastructure Roadmap.

The rise of Consumer Energy Resources in contributing to power flexibility is expected across a range of sectors.

We expect that AEMO will deliver Scheduled lite, better integrating Consumer energy resources to manage peak demand accompanied by market incentives for participation. This extends and should begin to incorporate batteries on wheels, which from 2025 should have a regulatory pathway to begin supporting the grid at scale with bi-directional offerings. The Federal government has just announced its National Energy Performance Scheme, which aims drive the energy institutions to better incentivise energy performance across the economy. Locally, NSW has shown leadership in this domain with the rollout of the Peak Demand Response Scheme, which as developed and matured we expect to contribute to flattening periods of peak demand. This scheme may also be complimented by a growing movement for a national scheme to support solar batteries in homes, by 2030 delivering a million batteries. This would see NSW home to approximately 200,000 batteries, or 2GW of peak demand reduction in people’s homes. These changes together will reduce the need for utility storage assets to provide short duration power support and instead push projects to provide significant time shifting of excess renewable energy.

Section 5. Long Duration Energy Storage Industry Perspective

From the long-duration industry perspective, there is considerable desire to keep the definition to 8 hours. The change in the definition will remove the clear and consistent investment signals needed to support a diverse set of LDES technologies contributing to the firming of the energy grid now and into the future.

Supply chain constraints have been a key issue in firming the grid throughout the energy transition, previously seen in the gold rush for lithium batteries in the utility Grid. The forecasted need for Long duration storage has been subject to change since the initiation of the NSW Electricity Infrastructure Roadmap, and we expect the forecasted need for LDES will continue to shift up and down over the energy transition. In that context and the reality of long lead times for many LDES technologies, it is unacceptable to have stop-start investment signals for deep storage technologies. Without consistent signals for investment in LDES solutions NSW will face serious hurdles to deliver projects when the times comes and there is a more urgent need for LDES in the energy system. Supply chain constraints

and delivery hurdles will threaten timely coal closure and a steady energy transition made worse by many jurisdictions turn their planning focus to LDES in a short window of time.

If the definition is changed from 8 to 4 hours, despite the reasons given above, there should be differential LTESA incentives in place to encourage longer duration solutions.

Question 4:

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

Yes, the LDS definition should be amended in order to include amalgamated or aggregated LDS infrastructure. This will support technology in two distinct ways.

Firstly, it will allow for smaller scale LDES technologies such as Flow batteries to aggregate projects as these technologies scale up their solutions.

Secondly, solid state batteries such as Lithium-ion should be able to aggregate batteries that are less than the LDES definition, to form together an 8hr LDES. I.e. two 4hr batteries operating commercially, and where needed, 'combine' to be an 8 hour battery, as explained in section 2.

Conclusion

Bespoke support for LDES in NSW is crucial, especially given the rapidly moving scale of the energy transition, which has so far tended to present new unexpected challenges every few years. Support for firming does need to become far more sophisticated in order to meet the needs of the energy transition, and innovative policy support can both increase the economic utilisation of well proven technologies as well as maintain strong investment signals for emerging LDES technologies.

Should you wish to discuss any of this submission further, please contact:
Wayne Smith, External Affairs Manager, Smart Energy Council
0417 141 812
wayne@smartenergy.org.au and connor@smartenergy.org.au