Submission

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Subject Infigen submission on storage integration

Infigen delivers reliable energy to customers through a portfolio of wind capacity across New South Wales, South Australia, Victoria and Western Australia, including both vertical integrated assets and PPAs. Infigen also owns and operates a portfolio of firming capacity, including a 123 MW open cycle gas turbine in NSW, a 25 MW / 52 MWh battery in SA, and will soon take ownership of 120 MW of dual fuel peaking capacity in SA. Our development pipeline has projects at differing stages of development covering wind, solar and batteries and we are also exploring further opportunities to purchase energy through capital light PPAs. This broad portfolio of assets has allowed us to retail electricity to over 400 metered sites to some of Australia's most iconic large energy users. Infigen has recently been acquired by Iberdrola, one of the world's leading energy companies.

1. Future system and challenges with the existing frameworks

Energy storage will play a critical role in the future grid, where variable renewable energy (VRE) will be the dominant source of energy, firmed by storage, peaking capacity, and increasing flexibility facilitated by digitally responsive loads and distributed energy resources. Therefore, having clear frameworks for the integration of these resources will reduce complexity for both developers and operators.

The existing frameworks (bidding as a separate load and generator) have been adequate to date, but do not seem well suited to capturing the operational capabilities of a single physical unit where the services from generation and load are linked. In particular, Infigen agrees with the issues raised by AEMO:

- Having separate DUIDs that refer to the same physical asset risks conflicting instructions or non-compliant bids, and creating less transparent dispatch constraints to ensure that the FCAS trapezium is appropriately applied
- Interpreting market data is more confusing, particularly for ancillary services where data for both DUIDs is typically assigned to just the generator DUID.
- Infigen agrees that there is a lack of clarity around ramp rates requirements, for both energy storage units and aggregated units more broadly.
- Improve clarity around technical obligations and connection requirements

In the future, we also agree that 'hybrid' facilities may become more common. This could include renewable generation and storage co-located with mine sites or other major loads, or the integration of storage behind existing connection points to minimize the impact of constraints or losses. Providing a framework for AEMO to manage multiple types of assets behind a single connection point, with clear metering and data reporting requirements, would be beneficial.

2. Interaction with ESB Post-2025 review

We consider that linking this package to the Two-Sided Market work of the ESB is critical. How increasingly responsive loads and embedded generation should be dispatched, metered, and reported will be important as these technologies capture more market share. We broadly support the principles of establishing guidelines for services rather than technologies (generation or load) where possible.

Given that this change is important, but not necessarily urgent, the AEMC should consider whether actioning some or all this rule change should be incorporated into (or deferred until after) the ESB Post-2025 process.

3. New registration category

Infigen in principle supports establishing a new registration category for energy storage systems, and a clear framework for managing multiple registration categories behind a single connection point. The AEMC has identified the key issues to be considered, however we note:

- Some care will be required to ensure that all capabilities are retained (for example, ensuring that definitions that refer to maximum capacity do not restrict a storage unit's offers into FCAS). We expect that this will ultimately be simpler than the current arrangements, however.
- While the ability to linearly transition between all setpoints in load/generation is important, there may be alternatives for resources such as pumped hydro that cannot smoothly transition between pumping and generating that still allow registration as a single entity (e.g., modifications to the FCAS trapezium to incorporate a No-Go zone similar to Basslink, to ensure Regulation and Contingency can be delivered, with while still allowing bids from a single unit). For the avoidance of doubt, we expect that pumped hydro units (or other technologies) should not be explicitly referenced in the Rules, but rather a technology neutral approach applied.
- New frameworks must avoid a wind or solar farm being forced to register as a scheduled generator if it co-locates a battery on site, or otherwise being forced to operate energy storage in a non-economic manner[1]. This will maximise the efficiency of the grid, and minimise distortions to locational decisions.

4. Responses to other questions

Ramp rates

Infigen would also support providing greater clarity on appropriate ramp rates from aggregated units. In our view, ramp rates should be based on the maximum aggregated generation, consistent with Chapter 2 of the NER, as proposed by AEMO. This provides consistency across generation types, and avoids spurious ramp rate requirements driven by the 1 MW minimum.

Grandfathering

All else equal, we consider there would be benefit in existing assets transitioning to the new registration category – simplifying future upgrades, as well as providing a consistent platform for AEMO to manage energy storage.

[1] Infigen recently provided a detailed submission to the AER on the costs of forcing semi-scheduled generators to "self-firm" within a dispatch interval (rather than using the Regulation or similar markets). These same arguments would also apply if wind or solar farms were forced to use on-site storage to firm output.
https://www.infigenenergy.com/assets/Uploads/Regulatory-Submissions/AER-Semi-scheduled-submission-Infigen.pdf

However, the cost of the transitioning to an asset is not yet clear, and could be material depending on the system changes required. Furthermore, given the pace of regulatory reform underway, it may be challenging to transition existing assets to the new registration category in a timely manner. As such, existing energy storage providers should have the option, but not the obligation, to transition to the new registration category. We recommend clear transition arrangements are developed and published, demonstrating there would be no new operational constraints and no risk of reopening the connection agreement.

Technical standards

Currently, in a number of cases, Customer and Generator technical standards conflict; a new registration category that consolidates standards (and reflects the primarily generation role of batteries) would simplify operations.

The Customer standards are generally written as maximum (not to exceed) requirements (for example S5.3.5 with power factor), whereas the Generator standards are written as minimum standards that must be met or exceeded (with some exclusions). In this respect, there are conflicts where the capability of storage may not theoretically be able to be utilised whilst acting as a load as opposed to that which would be available when being considered as a Generator (with negative generation). This is currently managed through development of a 'merged' set of performance standards but this is not ideal.

Allowing positive and negative bids from a single DUID would greatly simplify operations. While allowing 20 bid bands would preserve maximum flexibility from storage units, this would also require more system changes for both AEMO and participants. We note that AEMO's market management systems are currently only positive integer based and hence will require changes to allow negative bids and potentially fractional dispatch.

PASA

We acknowledge that system reliability is less deterministic than in the past. This is reflected in AEMO's move to statistical models for both PASA (multiple Monte Carlo iterations) and LOR conditions (the Forecast Uncertainty Measure metric).

We disagree, however, that storage is not currently "co-optimised" in pre-dispatch. Market participants such as Infigen regularly update bidding to ensure that the proposed dispatch schedule is physically (and financially) deliverable. This includes batteries, where software determines the most efficient dispatch, and continues to update bidding as conditions change, providing a consistently up to date – and co-optimised – schedule to AEMO. This necessarily takes into account the risk of dispatching "now" for a moderate prices versus "later" for an uncertain but potential high price event. We therefore do not see any need to change the pre-dispatch process, or any evidence now that pre-dipsatch is less accurate (or less fit for purpose).

In contrast, there are opportunities to improve the PASA framework, including clearer treatment of interregional transfers, reserve sharing, and local reserve requirements, which are critical for Infigen's Operating Reserves proposal but also for more transparent NEM operation. Incorporating greater information on energy storage, including available hours of storage capacity, and potentially state of charge information. We caution that this should not be treated as bid data, and that pre-dispatch should remain the "source of truth" for expected storage usage. In particular, if there is a conflict between projected reliability in PASA and in pre-dispatch, pre-dispatch should be treated as the projected use of storage.

Any changes to PASA should be progressed in conjunction with AEMO's current review.

RRO

We agree that energy storage should not be considered a liable party or contribute to the liable demand for the purposes of the RRO. In principle, storage might be charged over an identified gap period (e.g., to restore energy for future services). However, storage would never be charged at times that would lead to unserved energy, and therefore should not contribute to or exacerbate any reliability issues. Clarifying this would simplify future RRO compliance activities.

NEM fees and TUOS/DUOS charges

Infigen agrees with AEMO's proposed solution that Market Small Generator Aggregators and the proposed bidirectional resource provider participant categories should pay non-energy cost recovery and NEM Participant fees and charges based on consumed and sent out energy separately (consistent with current arrangements for grid-scale batteries). Implications for other categories of participants should be considered through the broader 2SM work being undertaken by the ESB.

Infigen supports energy storage units being exempt from TUOS charges, consistent with their primary function as a generator and only limited "consumption" of energy (i.e., roundtrip losses). As noted in our previous submissions, batteries already negotiate connection with TNSPs, and do not receive (or require) the same level of guaranteed reliability that a consumer would. [JG to grab additional comments from past submissions]

Further analysis of DUOS charging is required. We note that transmission charging is currently being explored through several rule changes, as well as the ESB's 2SM process. In general, exempting energy storage from DUOS would be most consistent with the way that storage uses the network, and align with TUOS. Charging large-scale energy storage DUOS may discriminate against embedding storage in distribution networks (where additional value stacking can be delivered). Conversely, exempting large-scale energy storage from DUOS may potentially discriminate against storage co-located with loads (where charging cannot be distinguished from consumption).

We again consider this needs to be considered as part of the 2SM process, ensuring a technology neutral approach.

Conclusion:

We look forward to the opportunity to continue to engage with the AEMC. If you would like to discuss this submission, please contact Dr Joel Gilmore (Regulator Affairs Manager) on joel.gilmore@infigenenergy.com or 0411 267 044.

Yours sincerely

Ross Rolfe
Managing Director