

**Lawrence Molloy
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4 February 2026

Re: Clarifying hydro and pumped hydro classifications, and power (GW) versus energy (GWh) reporting for deep storage in the draft 2026 Integrated System Plan

Dear Nicola Falcon,

I am a PhD candidate in engineering at the University of Melbourne, with a research focus on pumped hydro energy storage and long-duration energy storage policy in Australia. I welcome the opportunity to provide comments on AEMO's Draft 2026 Integrated System Plan.

The ISP is a critical and evolving piece of system planning work, developed in a context of rapid change in generation, storage and demand. The comments below are offered in support of the 2026 Draft, with the sole aim of seeking greater clarity in how hydro and pumped hydro classifications are expressed in the narrative, and consistent with the modelling framework described in Appendix A2.

Summary

The Draft 2026 ISP reflects a technically coherent treatment of hydro and pumped hydro in the modelling framework described in Appendix A2. Reservoir-backed hydro is modelled as energy-constrained dispatchable generation governed by water budgets and operating obligations, while pumped hydro is modelled as closed-loop storage with engineered duration characteristics.

The comments below relate to how these modelling distinctions are expressed in the ISP narrative, rather than to the modelling itself. In particular, the Draft ISP uses multiple classification lenses—technology type, system role, and duration—without always making explicit which lens is being applied. This creates a reasonable risk of additive interpretation where none is intended. The suggested changes are editorial in nature and are intended to improve interpretability while remaining fully consistent with Appendix A2.

1. Relationship between “existing deep hydro” and “pumped hydro storage”

In the Draft ISP, references to approximately 7 GW of existing deep hydro and 6 GW of pumped hydro storage appear in close proximity and are both expressed in GW. Without explicit reconciliation, this can reasonably be read as two distinct capacity pools.

We have to infer from the text that:

- 7 GW “deep hydro storage” \approx Snowy + Tas hydro + QLD (incl. Wivenhoe) + smaller schemes (some pumped, some not).
- 6 GW “pumped hydro storage” = all pump-turbine schemes in 2050: existing ones plus Snowy 2.0, Borumba, Kidston, Phoenix.

Appendix A2 indicates that these figures arise from different classification lenses:

- “Existing deep hydro” reflects a system role (deep energy availability over time), largely associated with reservoir-backed hydro; while
- “Pumped hydro storage” reflects a technology class (pump-turbine schemes), some of which also contribute to the deep storage role.

Suggested editorial clarification:

A short reconciliation statement or table explicitly noting that these are overlapping descriptors (role-based versus technology-based), and that assets appearing in both descriptions are not double counted in the modelling, would remove the appearance of additive accounting. A single sentence would likely be sufficient.

2. Power (GW) versus energy (GWh) in discussion of deep storage

The Draft ISP appropriately uses GW when discussing capacity adequacy. However, “deep storage” is primarily an energy adequacy concept, defined by deliverable energy over time during extended lulls and seasonal stress periods.

Appendix A2 shows that reservoir hydro deliverability is constrained by water budgets and operating obligations (including environmental releases), which directly limit sustained output over multi-day or seasonal horizons.

Suggested editorial clarification:

Where deep storage and seasonal firming are discussed, a brief statement distinguishing:

- GW as instantaneous output capability, and
- GWh (or equivalent full-load hours) as the determinant of sustained delivery for deep storage,

would materially reduce the risk of misinterpretation, even if presented only at a system level.

3. Reservoir hydro versus pumped hydro in long-duration contexts

Appendix A2 draws a clear operational distinction:

- reservoir hydro is dispatchable generation constrained by hydrology and operating rules; and
- pumped hydro is closed-loop storage constrained by engineered duration.

In the Draft ISP narrative, both are frequently discussed together under “deep storage” without always making this distinction explicit.

Suggested editorial clarification:

A short, boxed explanation or schematic mapping:

- technology type,
- system role, and
- primary constraint (water budget versus engineered duration),
would improve internal consistency and reader comprehension without changing any modelling outputs.

Closing

Clarifying these definitional boundaries in the ISP narrative would improve interpretability and reduce the likelihood of overlapping category labels being read as additive totals. The suggestions above are intended to make explicit, within the Draft ISP text, distinctions that already exist in the modelling framework described in Appendix A2.

Sincerely,

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