Format for submissions

Common quality and wholesale market arrangements for BESSs and BESS-hybrid stations – Issues and options consultation paper

Submitter	**Pacific Power Resources Limited (PPR)** **Email: pburnaby@pacificpowerresources.co.nz** PPR is a standalone, utility-scale battery energy storage developer. We place BESS at specific points on the transmission grid — close to main load centres, behind transmission constraints, where there is no co-located generation and where storage is most valuable and most needed by the power system. This locational focus is central to the system value we provide, including for locational ancillary services such as voltage support and local frequency response. BESS-hybrid stations, by contrast, is generally sited where there is sufficient land for intermittent generation, and generally cannot occupy these optimal network locations. Our central theme is that common-quality and market arrangements should be technology- and configuration-neutral: a standalone BESS should never be disadvantaged relative to a BESS inside a hybrid, and owners should retain the option to own and operate a BESS separately from generation — including the BESS component of a co-located arrangement.

Section 3: Terminology

Questions	Comments
Q3.1. Do you support the proposed 5-level structure for generating asset definitions?	Yes, we support the proposed five-level structure subject to our comments below on clarifying definitions. A BESS-hybrid is not defined by a single point of connection, as several separate owned / operated projects can use a single point of connection with Transpower (e.g. a transmission line). Rather a BESS-hybrid would be defined by a common generator resource ID with Transpower - set up operationally as a singular generator entity reflecting how it will be operated and coordinated. In the

	situation where two or more projects are identified separately by Transpower, and operated and coordinated separately, then it's no longer a BESS-hybrid – even if it uses a common gentie line / point of connection. From a standalone BESS perspective, the key benefit is that a standalone BESS is clearly captured at Level 4 (BESS station) and is distinct from a Level 5 hybrid generating station. We support retaining that clear separation so standalone BESS continue to be treated on their own terms and are never swept into hybrid-specific obligations (including when they are co-located with renewables, but owned and operated separately).
Q3.2. Do you foresee any implementation issues or unintended consequences associated with the 5-level structure for generating asset definitions?	The main risk we see is definitional 'bleed' between levels — in particular, drafting that inadvertently brings a standalone BESS (Level 4) within hybrid (Level 5) obligations, or that treats a BESS differently depending on whether it sits inside a hybrid. The structure should map cleanly and consistently into Parts 8 and 13 so that a standalone BESS is always assessed as a standalone station. We would also caution against the definitions hard-coding any assumption that a hybrid is necessarily 'operated as a single resource' for every purpose (unless it is set up that way with Transpower with a singular generation ID), since owners may wish to own, offer or operate components separately. The structure should preserve that choice.
Q3.3. Do you have any feedback on the System Operator's recommendations in its *Hybrid Plant Integration* report?	

Section 4: Asset owner performance obligations for 'idle' BESSs and BESS-hybrid stations

Questions	Comments
Q4.1. Do you agree with how the Authority has defined the 'idle' operating state of a	Yes, we agree with the definition of the 'idle' operating state — electrically

BESS and a BESS-hybrid station? Please give reasons if you do not agree.	connected but neither injecting nor consuming active or reactive power and not cleared for dispatch.
Q4.2. Do you consider that frequency management obligations should apply to an idle BESS and an idle BESS-hybrid station? Please give reasons if you do not agree.	We strongly oppose this. An idle BESS should be treated the same as any other generator that is not operating. A generator that is not synchronised or not running carries no frequency-management obligation; an idle BESS — connected but neither charging, discharging nor cleared for dispatch — is in the same position and should carry none either. We support Option 1B: neither frequency nor voltage AOPOs apply when idle. Applying frequency AOPOs to idle BESS would impose operational and wear costs with no associated revenue stream to recover them, would dampen investment signals, and would treat BESS differently from every other technology that has no obligation when not operating. It could also create perverse incentives to manipulate operating states purely to manage AOPO exposure. If the system needs frequency capability from connected-but-idle resources, the efficient answer is to procure it, not to mandate it for free from BESS.
Q4.3. Do you consider that voltage support obligations should apply to an idle BESS and an idle BESS-hybrid station? Please give reasons if you do not agree.	No, for the same reasons as Q4.2. An idle BESS should face no voltage support obligation, consistent with the treatment of any generator that is not operating. We support Option 1B. We acknowledge the incremental cost of voltage support while idle may be lower than for frequency support. But that is an argument for procuring it where it is needed — not for mandating it without compensation. A mandated, unfunded obligation on idle BESS would distort investment and competitive neutrality. Further, as a standalone BESS company who places BESS close to load centres behind constraints, we believe any local voltage support we can provide – because of the locational advantage – should be compensated.

Q4.4. Do you foresee any implementation issues or unintended consequences that we have not discussed in this paper?	The principal unintended consequence of applying AOPOs to idle assets is the competitive distortion and gaming risk the paper itself identifies: owners altering controller or operating states solely to manage AOPO exposure, and the System Operator needing new telemetry and monitoring to detect idle states. More fundamentally, applying AOPOs to a new operating state extends a mandate-based framework that is increasingly strained as the generation mix changes. We think the better long-run direction is competitive, technology-neutral procurement of these services.
Q4.5. What do you consider to be the key benefits and costs associated with applying frequency- and voltage-related AOPOs to BESSs and BESS-hybrid stations in the 'idle' operating state? Please quantify these benefits and costs if possible.	We cannot put precise figures on these without a defined obligation to cost against, but qualitatively: the benefits of mandating idle AOPOs are modest and largely duplicative — the same frequency and voltage capability can be obtained, when actually needed, from connected resources. The costs are real and fall on BESS owners: battery cycling/wear and auxiliary losses to hold capability while idle, with no dispatch revenue to offset them; dampened investment signals from being singled out relative to other technologies; and System Operator costs to monitor and enforce state-dependent obligations. On balance the costs of applying idle AOPOs outweigh the benefits, and the benefits that do exist would be better revealed and met through procurement than hidden as an unfunded mandate.

Section 5: Applying the AOPOs to BESS-hybrid stations

Questions	Comments
Q5.1. Which option for applying frequency AOPOs to BESS-hybrid stations that are in the injection or consumption operating state do you support? Please give reasons for your answer.	In Q3.1 we stated our rationale for defining a BESS-hybrid including when it's a true BESS-hybrid and when it's two or more separate projects, even if behind the same point of connection (which wouldn't necessarily mean it's BESS-hybrid).

	As such we support Option 2A insofar as it's a true BESS-hybrid – i.e. set up operationally with Transpower as a singular generator entity reflecting how it is registered and will be operated and coordinated. However, if a 'BESS-hybrid' definition would also mean there are two or more separate projects behind the same point of connection, as separate generation entities registered with Transpower; or co-located projects with separate points of connection; then these should be treated as separate components in-line — component-level frequency management obligations, assessed for each technology component. Component-level assessment keeps obligations aligned with ownership. We want to retain the option to own and operate the BESS component of a co-located BESS-plus-solar arrangement — potentially behind a shared point of connection — without becoming entangled in another party's compliance.
Q5.2. Do you consider there to be options for applying frequency AOPOs to BESS-hybrid stations in the injection or consumption operating state that are preferable to those identified by the Authority? Please give reasons for your answer.	The more durable answer — which sits beyond this question — is to AOPO frequency keeping and reserves toward competitive, technology-neutral procurement, so the service is provided by whichever resource is most efficient rather than prescribed as an obligation..
Q5.3. Do you foresee any implementation issues or unintended consequences associated with applying the frequency AOPOs to BESS-hybrid stations in the injection or consumption operating state that are not identified in this paper?	
Q5.4. What do you consider to be the key benefits and costs associated with the options for applying frequency AOPOs to BESS-hybrid stations that are in the injection or consumption operating state? Please quantify these benefits and costs if possible.	

Q5.5. Which option for applying the voltage support AOPO to BESS-hybrid stations that are in the injection or consumption operating state do you support? Please give reasons for your answer.	We support Option 3A — station-level voltage support assessed at the point of connection. We support this on the basis that it aligns with our definitions of a true BESS-hybrid in Q3.1 and Q5.1. Where co-located components (even with the same POC) are separately registered, owned, operated, and coordinated, each should be assessed on its own contribution rather than as a single combined entity. We separately support modernising clause 8.23 so that a standalone station's voltage obligation is assessed at its own point of connection. Standalone BESS near load centres are well placed to provide voltage support where the network needs it, and should be assessed on their own performance.
Q5.6. Do you consider there to be options for applying the voltage support AOPO to BESS-hybrid stations in the injection or consumption operating state that are preferable to those identified by the Authority? Please give reasons for your answer.	
Q5.7. Do you foresee any implementation issues or unintended consequences associated with applying the voltage support AOPO to BESS-hybrid stations in the injection or consumption operating state that are not identified in this paper?	
Q5.8. What do you consider to be the key benefits and costs associated with the options for applying the voltage support AOPO to BESS-hybrid stations that are in the injection or consumption operating state? Please quantify these benefits and costs if possible.	
Q5.9. Do you consider that clause 8.23 should be revised to move the point of compliance from the generating unit terminals to the point of connection to the transmission network (on the high voltage	Yes. Moving the point of compliance from the generating-unit terminals to the point of connection is the right, technology-neutral modernisation insofar as operational separation of generation and BESS functions is achievable in the scenario when co-located components are owned, operated,

side of the connection transformer)? Please give reasons for your answer.	and coordinated separately (even if behind the same point of connection). It aligns the obligation with where voltage impacts are actually experienced on the network and with a station's real export capability, and it reflects the more distributed layouts of modern inverter-based resources. As a standalone BESS operator connecting into transmission near load centres, we are well placed to provide voltage support at the point of connection, and we prefer obligations defined there rather than at unit terminals.
Q5.10. Do you consider there to be an alternative that is preferrable to a reactive power export/import requirement of ±39.5% or ±33% of maximum continuous MW output power, measured at the generating station's point of connection to the transmission network (on the high voltage side of the connection transformer)? Please give reasons for your answer.	
Q5.11. Do you foresee any implementation issues or unintended consequences associated with moving the point of compliance under clause 8.23 from the generating unit terminals to the point of connection to the transmission network that are not identified in this paper?	An unintended consequence would be not allowing for owner / operational separation of generation and BESS functions if they were registered and operated as separate projects with Transpower, even if they sat behind a common point of connection.
Q5.12. What do you consider to be the key benefits and costs associated with moving the point of compliance under clause 8.23 from the generating unit terminals to the point of connection to the transmission network? Please quantify these benefits and costs if possible.	
Q5.13. Do you consider that legacy arrangements would be needed for existing generation? Please give reasons for your answer.	A tightly-scoped legacy arrangement for existing generation is reasonable, to preserve the reactive-power import support the System Operator currently relies on and to avoid stranding investments made under the prior standard. Any legacy provision should be limited to genuinely existing

	assets, be time-bound, and not be extended in a way that entrenches a durable advantage for incumbents over new entrants. New connections should move to the modernised, point-of-connection standard.

Section 6 questions: Wholesale arrangements for BESS-hybrid stations

Questions	Comments
Q6.1. Do you agree with the preferred option of requiring BESS-hybrid stations to offer by technology component except in certain circumstances, over the alternative option of creating new obligations for BESS-hybrid stations? If not, why not?	Yes — we support the preferred Option 4A: requiring BESS-hybrid stations to offer by technology component, applying the existing trading obligations to each component as if it were a standalone station, with the option to offer as a single station where that genuinely reflects operation and the System Operator does not require component-level offers. It keeps standalone and hybrid BESS on the same footing: the BESS component of a hybrid trades under the same rules as a standalone BESS, so neither configuration is advantaged, and owners retain the option to own and operate a BESS separately from generation.
Q6.2. Do you agree with our characterisation of the benefits and costs with our preferred option? Are there any other aspects we should consider?	We agree with the Authority's characterisation. The main benefit — leveraging established arrangements and preserving competitive neutrality — is correctly identified, and the main cost (some additional offering complexity for multi-component stations) is modest and is a consequence of the hybrid owner's own configuration choice, not something that should be socialised or smoothed away through special arrangements.
Q6.3. Do you agree station dispatch arrangements should be extended to accommodate BESS-hybrid stations that are offered by technology component? What, if any, other issues do you see with	We have no objection to extending station-dispatch arrangements as an option for hybrids that offer by component, provided it is genuinely optional and does not erode scheduling and SoC-forecast accuracy. As set out in our companion submission, the integrity of SoC information and the System

the station dispatch arrangements that are in addition to those identified above?	Operator's post-gate-closure security assessments matters; any additional freedom to update offers within gate closure for station-dispatch hybrids should be confined to what is necessary to reflect actual operation. That flexibility should not become a means for hybrids to obtain looser gate-closure treatment than standalone BESS.
Q6.4. Considering the options above, how should the System Operator manage network injection from a BESS-hybrid station where injection is limited by inverter capacity? What implications would this have on your processes or systems?	This issue arises principally for DC-coupled hybrids whose injection is inverter-limited. The System Operator should model the constraint in whatever way is most operationally robust and accurate — the static market-node constraint appears reasonable — but the cost and obligation of providing and maintaining accurate inverter-capacity information should sit entirely with the hybrid owner. The need for this modelling flows from a private configuration choice; it should not impose cost on other participants or attract any special accommodation.
Q6.5. Do you agree with our preferred approach to calculating constrained costs for DC-coupled BESS-hybrid stations? Can you provide any insights about what metering arrangements would be required to enable this approach?	DC-coupling is a configuration developers adopt for their own benefit — principally to reduce system losses — and it should attract no special allowance or compensating market advantage. We therefore do not support the Authority building, and effectively socialising, a bespoke DC-side metering and constrained-cost regime as the default. If a DC-coupled owner wishes to be assessed on a component basis, it should be permitted to install the necessary DC-side metering only at its own full cost, with no socialised cost and no resulting market benefit relative to AC-coupled or standalone stations.