AUSTRALIAN GRID STORAGE INSTALLATIONS / INDEPENDENT RESEARCH

What a battery can deliver at the evening peak

Three Australian installations show how projects with similar power ratings can cover very different calls on the grid. Buyers can test a bid by specifying the export duty and the hours for which it must be sustained.

4.0 h

Rated discharge duration across both stages of the Collie Battery



Rated discharge time at maximum power

Hours · published energy capacity divided by power capacity



Hornsdale: 193.5 MWh / 150 MW. Victorian Big Battery: 450 MWh / 300 MW. Collie: 2,240 MWh / 560 MW across its two operating stages.

Neoen • operating project ratings Net Zero Economy Authority • Collie stages

EXHIBIT 02 · GRID STORAGE

What a 100 MW evening obligation would require

Tender condition	Illustrative duty	Procurement implication
Export for two hours	200 MWh delivered	Check net AC energy at the meter.
Export for four hours	400 MWh delivered	Obtain a separate installed-price quote for the extra energy.
Recharge after four hours	≈444 MWh grid input at 90% round-trip efficiency	Check that the charging window and import limit permit the next dispatch.

Illustration assumes a flat 100 MW export and a net 90% round-trip efficiency. The efficiency is a modelling assumption, not a warranty for the Australian assets.

Why the shape of the peak matters

With a 100 MW grid connection, two hours of uninterrupted export requires 200 MWh delivered at the meter. Four hours requires 400 MWh. The interconnection can stay the same size while energy storage, land, thermal management and recharge needs change.

Service commitments can reserve part of the plant

Victoria’s system integrity scheme can reserve 250 MW of the 300 MW Victorian Big Battery during the summer period. The state identifies 50 MW for market participation during that period. A model that sells all 300 MW into the spot market at the same time would overstate available revenue.

PROJECT AND CONTRACT EVIDENCE

Collie’s four hours serve a defined evening obligation

The Australian government records two operating stages with a combined rating of 560 MW and 2,240 MWh. A separate capacity contract specifies how much of the second stage must be available at the evening peak.

Project observation	Power / energy	What it measures
Stage 1 · operational October 2024	219 MW / 877 MWh	Published installed capacity. The stage-wide energy-to-power ratio is approximately four hours.
Stage 2 · operational July 2025	341 MW / 1,363 MWh	Installed rating. Combined with stage 1, this reconciles to 560 MW / 2,240 MWh.
Stage 2 · contracted peak service	300 MW for four hours	Equivalent to a 1,200 MWh service obligation at full call. The contract has its own terms and operating window.

Why the difference matters

The second stage has 41 MW more installed power than the stated service obligation. The arithmetic difference does not establish that all 41 MW can earn simultaneous market revenue. State of charge, the contract and system constraints determine what can be offered.

Net Zero Economy Authority · operating Collie stages Neoen · stage-two four-hour service contract

BUYERS, SUPPLIERS AND QUALIFICATION

Who buys the service, and who carries the risk?

A reliability buyer buys a duty over time. The project owner must translate that duty into equipment, dispatch and a performance guarantee. Collie's stage-two agreement and Victoria's summer reserve show why system needs can produce different contracts.

Participant	Decision	Evidence that governs delivery
System or reliability buyer	How much power, over what hours, in which seasons?	Dispatch notice, performance window, availability definition and treatment of missed delivery.
Owner or operator	How much usable energy to hold in reserve?	Metered state of charge, charging rights and an agreed hierarchy of competing service calls.
Integrator and equipment vendor	How much installed energy sustains the required AC duty?	Net energy and power guarantees, auxiliary loads, degradation curve, augmentation and warranty remedies.

Avoid double selling the same MW

Victoria identifies 50 MW available to energy markets in summer at the 300 MW Victorian Big Battery. A base-case model that simultaneously allocates 300 MW to spot arbitrage and 250 MW to the summer grid service has committed 250 MW twice.

Victoria Department of Energy · summer service allocation

COMMERCIAL SENSITIVITY / ILLUSTRATIVE CASE

What annual payment covers two additional hours?

Compare a 100 MW two-hour design with a four-hour design at commissioning. The second adds 200 MWh of usable energy. A constant annual payment for the longer duty must cover the incremental installed cost and operating expense.

Assumed USD/kWh added	Incremental capex	Annual recovery + O&M	USD per MW-year
$120	$24.0m	$3.09m	$30,919
$180	$36.0m	$4.64m	$46,379
$240	$48.0m	$6.18m	$61,838

Illustrative installed cost for the incremental usable AC energy, 15-year life, 8% discount rate and annual fixed O&M equal to 1.2% of incremental capex. Annual capital recovery = capex divided by the annuity factor. Each result is spread over the same 100 MW.

Metered energy over the contract life

At USD 180/kWh, the extra energy costs USD 36m upfront. The annual-payment threshold covers only the stated incremental costs. Price charging energy, performance penalties and future augmentation separately when a contract requires four hours throughout its life.

DECISION AND DILIGENCE

Test the most difficult dispatch day

Write the acceptance test around delivery at the agreed meter. Nameplate duration is the first screen. The investment case depends on whether the plant can deliver after degradation and recharge in time for the next obligation.

01 Dispatch specification

Provide the export profile, minimum recharge window, import limit and relevant seasonal operating conditions.

02 Reliability and warranty

Ask for net AC guarantees at commissioning and at the end of the commitment. Document auxiliary loads, augmentation and who pays for unavailable capacity.

03 Commercial comparison

Request the availability payment, any energy settlement and penalties on a consistent basis. Simulate overlapping calls using the same stored energy once.

When a shorter battery could compete

If the buyer can reduce the delivery window or accept lower MW later in the peak, a shorter-duration plant may qualify. Compare the value of that revised service with the saving in installed energy.

OPERATING IMPLICATIONS

Size for performance late in the contract

Ask vendors for warranted usable AC energy at the point of interconnection, the ambient conditions behind that guarantee, the allowed state-of-charge range and the augmentation schedule. Degradation and auxiliary loads can change the usable export even when equipment nameplates stay fixed.

DECISION

Give each bidder the same hourly dispatch profile and end-of-term energy requirement. Compare guaranteed delivery, recharge time and whole-life cost on that basis.

Method

Divide each published MWh rating by its corresponding MW rating. Add Collie's two stage ratings before division. The tender example independently calculates energy as power multiplied by time and recharge input as delivered energy divided by assumed efficiency.

Scope of the evidence

Published ratings do not establish guaranteed end-of-life energy, actual dispatch or merchant revenue. The three projects illustrate design choices and service obligations in different power systems.

Source documents

Neoen • operating project ratings
Net Zero Economy Authority • Collie stages
Victoria Department of Energy • service reservation
Neoen · stage-two four-hour service contract