MODOENERGY Q4 2026

The hybrid landscape

Why the market is going hybrid, and how to value and model hybrids

SPEAKERS

Marcus Freese
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Frances Hallen
Market Analyst

Tom Derrick
Lead Data Scientist

Agenda

01 **Welcome and introduction to Modo Energy**
Marcus Freese

02 **Market update: buildout, compressed spreads and the outlook to 2030**
How 12 GW of batteries in 12 months reshaped the NEM, and how the market is responding · Barnaby Winser

03 **Why the market is going hybrid: pipeline, revenues and dispatch**
Where hybrids are being built, what offtakers are buying and how operating hybrids run · Frances Hallen

04 **Forecasting and valuations: how we model a hybrid**
Coupling, loss factors, the network and sizing in Modo Energy's forecast · Tom Derrick

Join us on Slido

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Scan the QR code to ask questions and vote in live polls throughout the workshop.

Sydney Hybrid Workshop

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Modo Energy: three pillars of trusted data

Revenue Benchmarks

Every operational NEM battery, measured the same way. Used in contracts to manage optimiser performance.

Market Research

Trusted research on what moved, why and what it means for investors. Cited by Bloomberg, BBC & ABC

Bankable Forecasts

Revenue outlooks used in debt and IC processes. Uniquely at 5 minute granularity & nodal.

Ko your energy market analyst

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Why the market is going hybrid

Buildout, compressed spreads and the outlook to 2030

Barnaby Winser
Market Analyst

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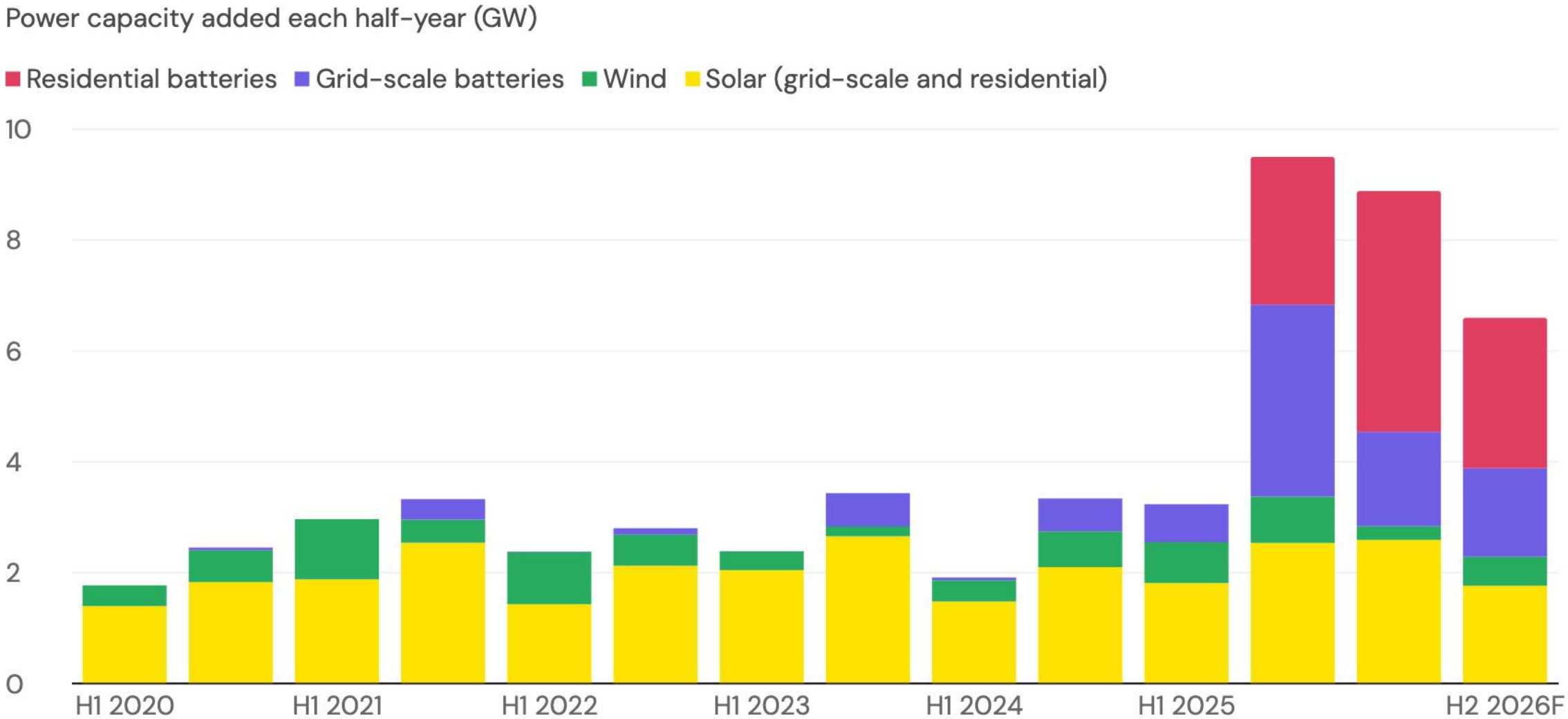
What we will cover

01 How 12 GW of batteries in 12 months have reshaped the NEM

02 Spreads compressed, reducing battery revenue and lifting the solar opportunity

03 The market response: longer duration and hybrid assets

12 GW of grid-scale and residential batteries in 12 months



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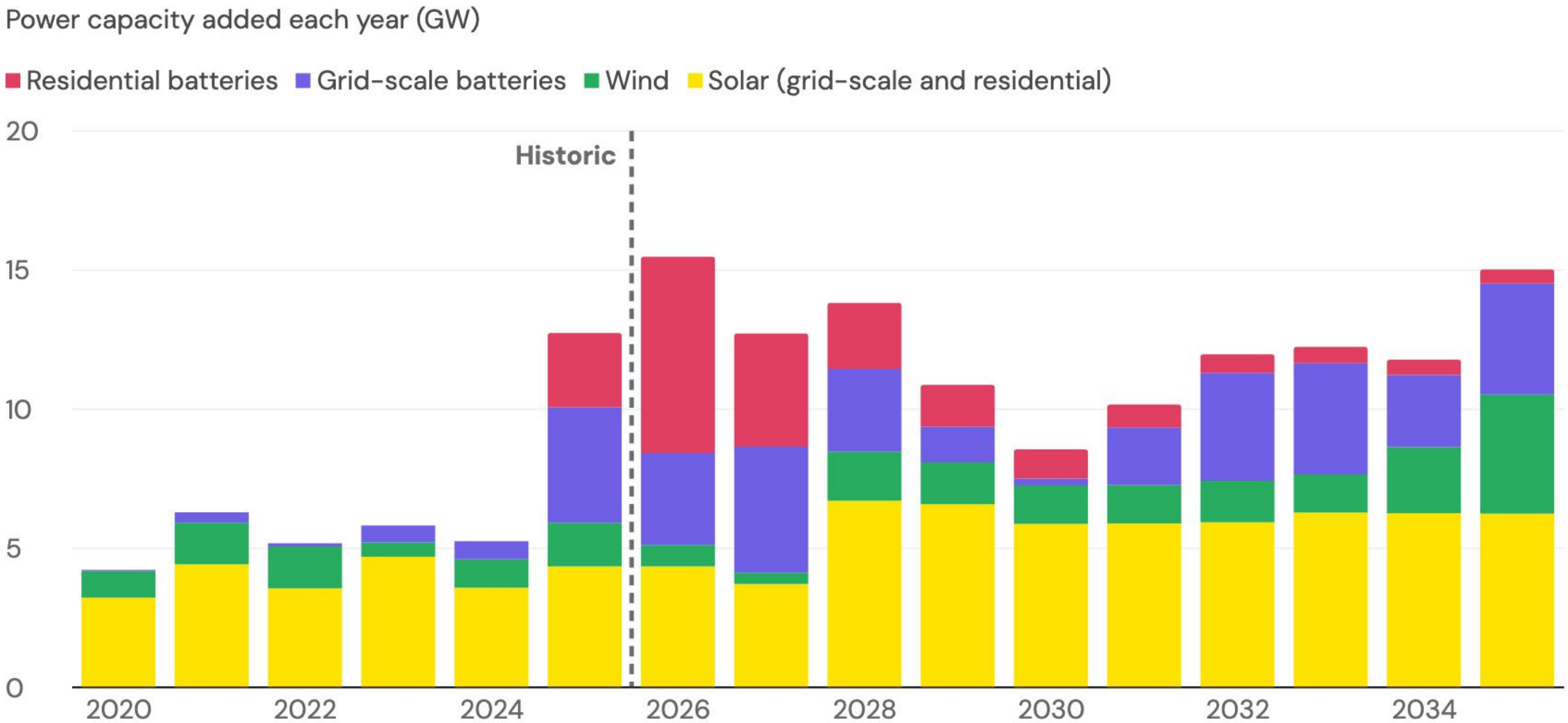
2026 is likely to remain the record for battery deployment for at least a decade



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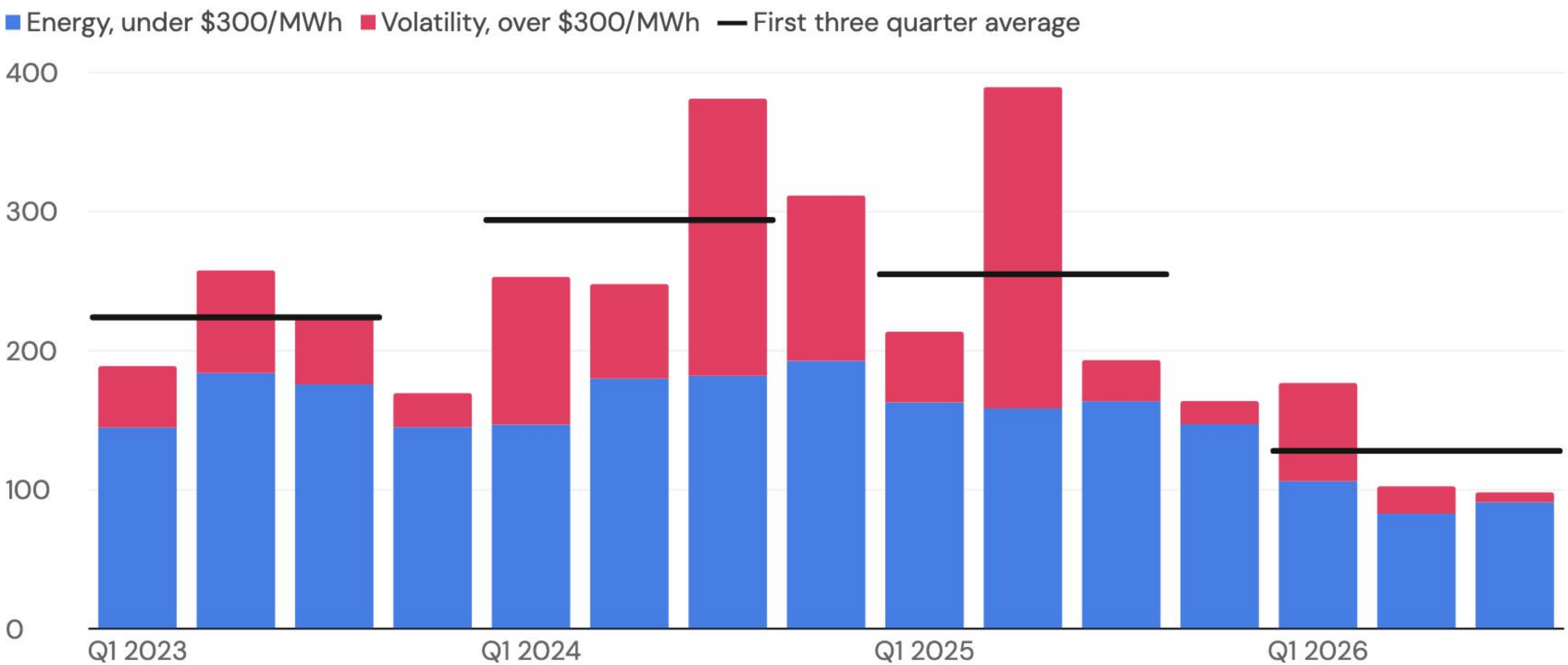
Price spreads down 50% in the first three quarters of 2026

Average daily 4-hour spread by quarter ($/MWh)



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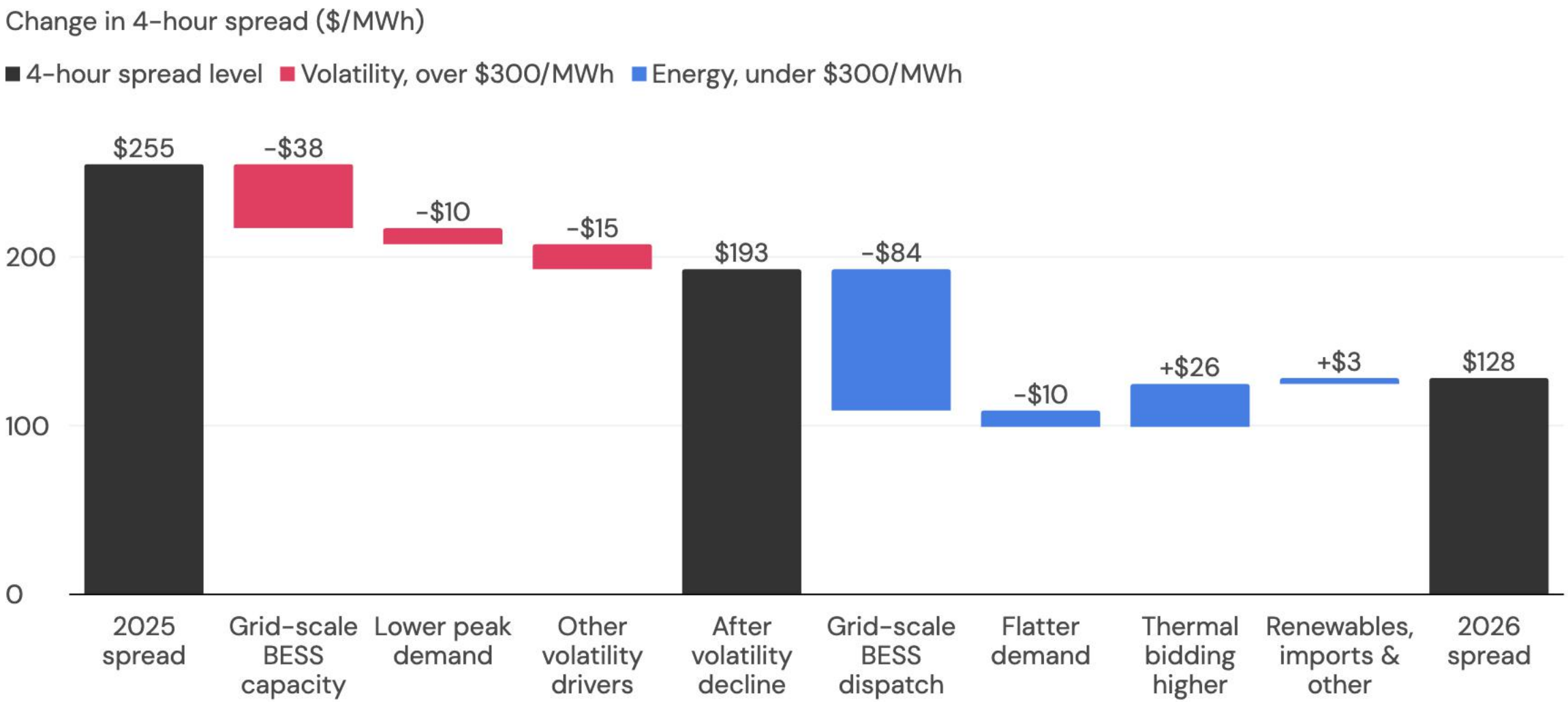
New BESS capacity is the main driver of spread compression



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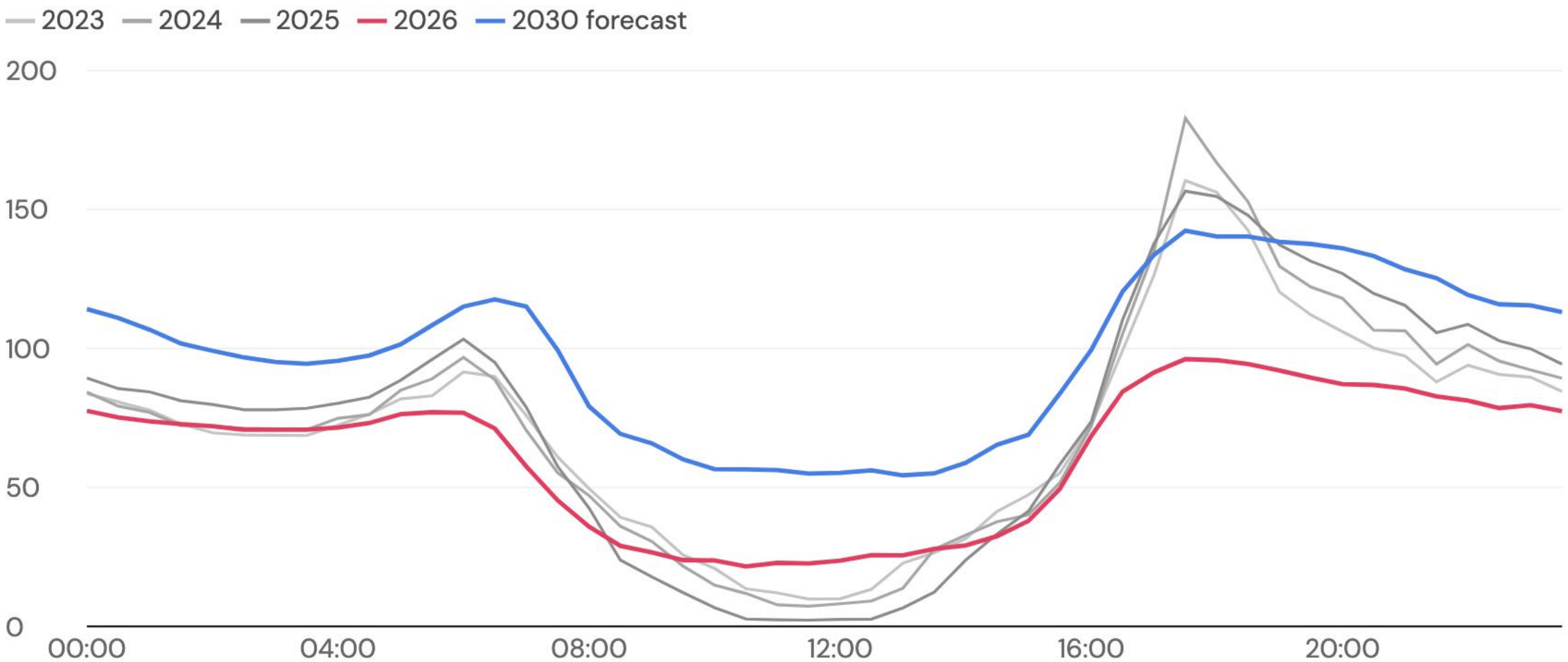
The duck curve is flattening but lifts as coal retires

Median wholesale price by half hour of the day, 1 January to 9 November ($/MWh)



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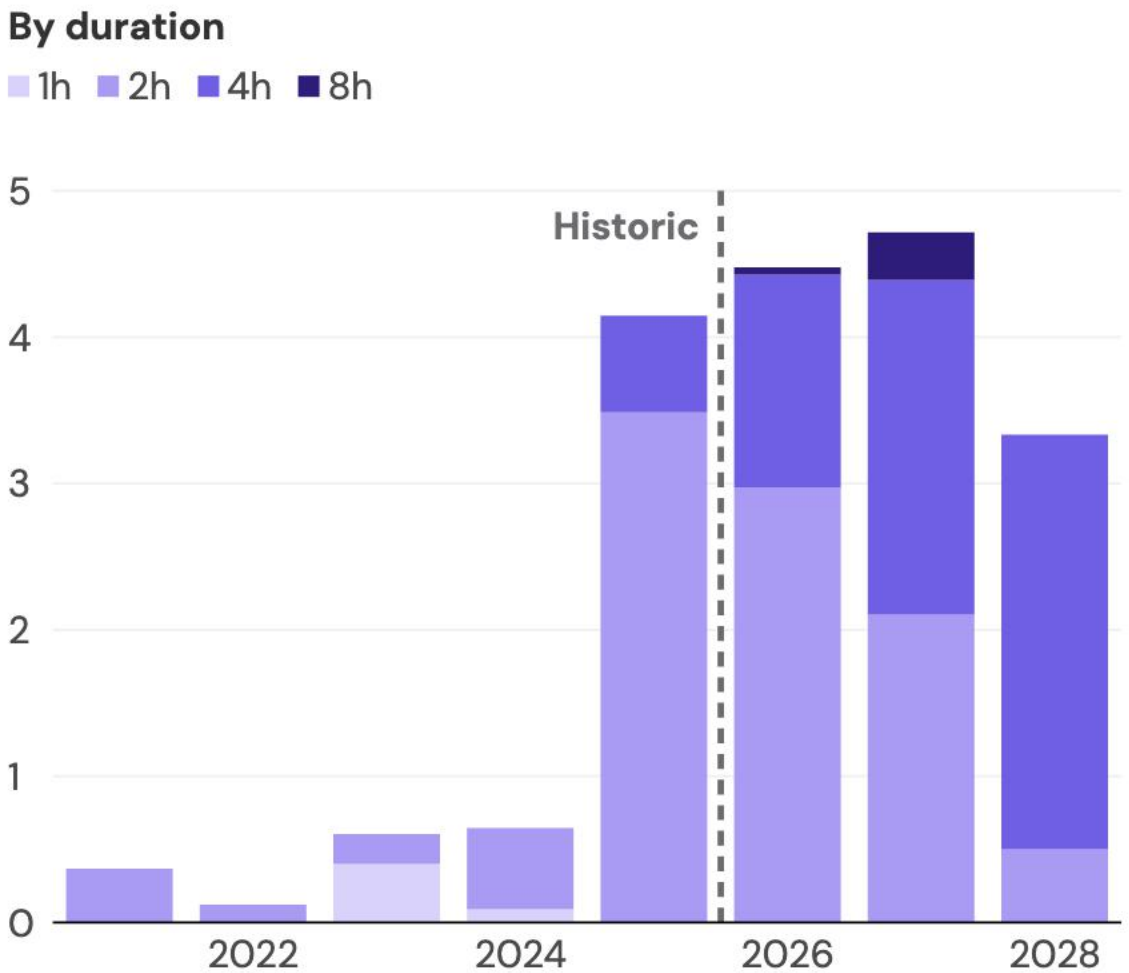
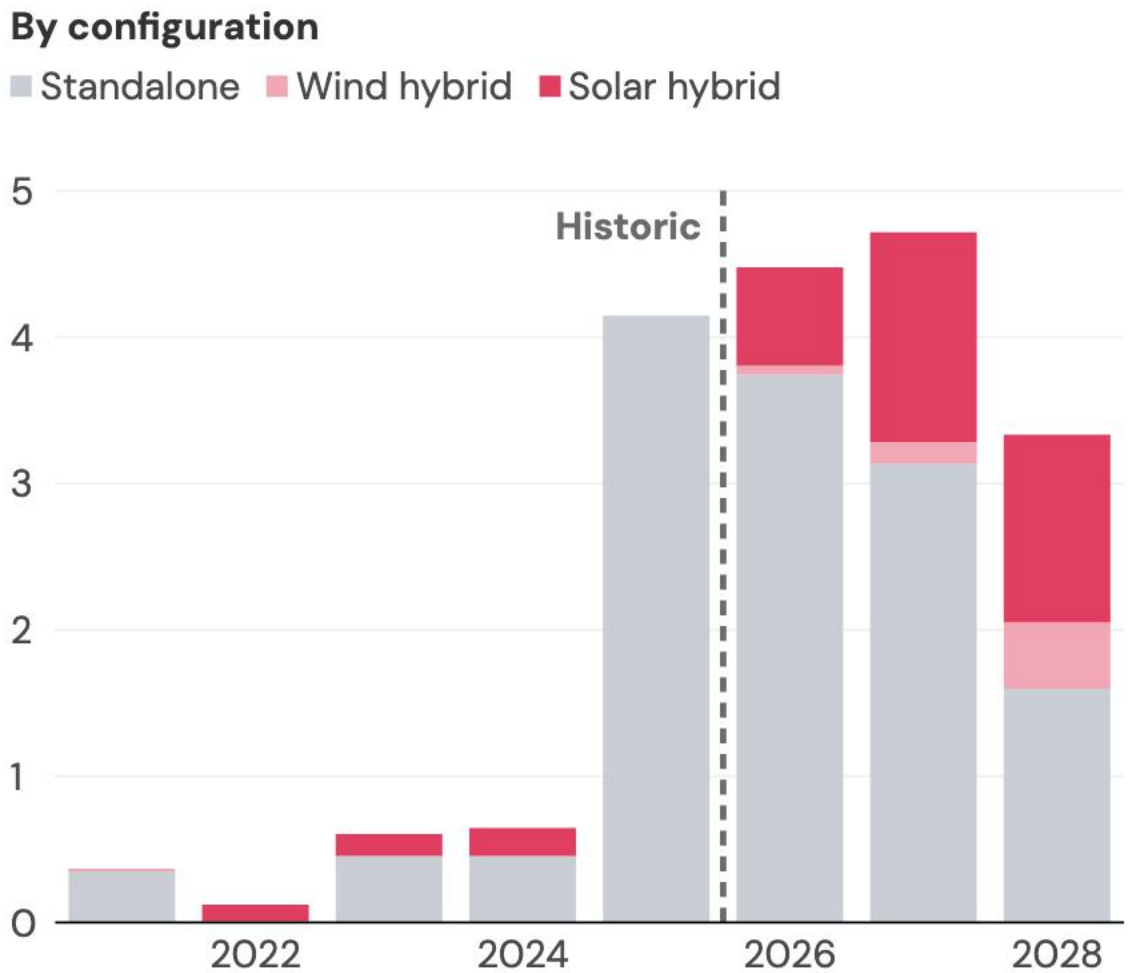
The pipeline is shifting to longer durations and hybrids

Annual NEM battery additions (GW)





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The NEM hybrid landscape

Pipeline, contracts, and operations

Frances Hallen
Market Analyst

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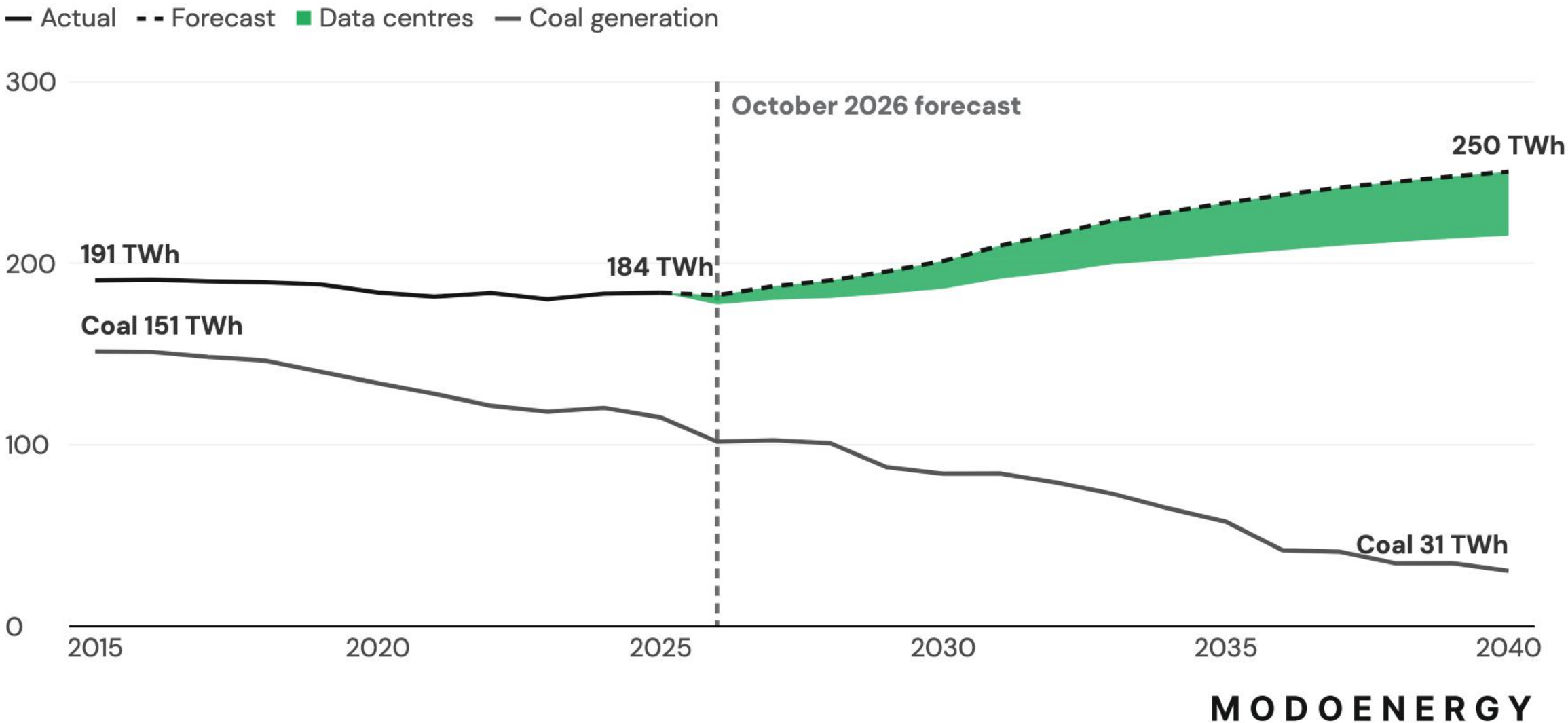
Operational demand, flat for a decade, grows 36% by 2040, led by data centres

NEM operational demand and coal generation, actual and October 2026 central forecast (TWh)



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What we will cover

01 Solar's shift from retrofits to greenfield hybrids

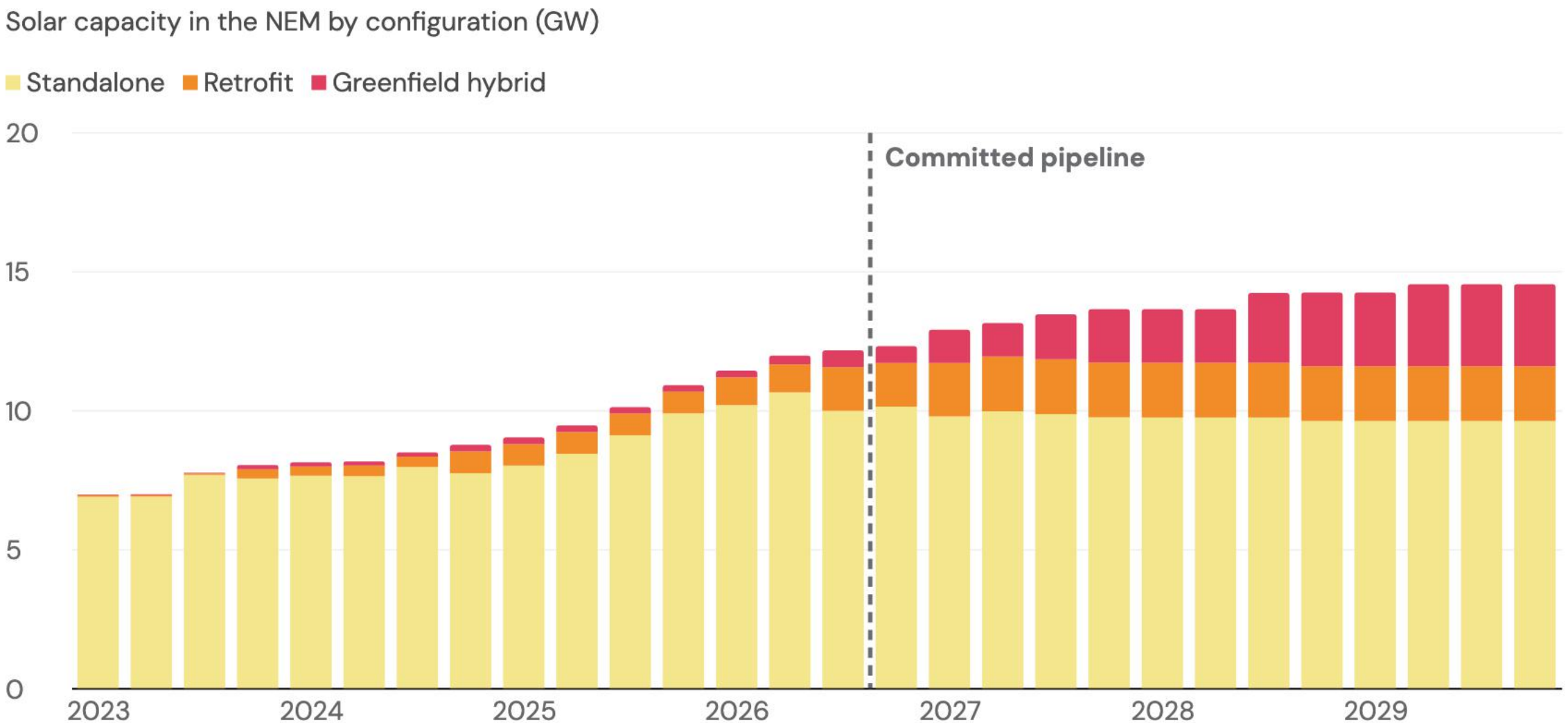
02 Battery-to-renewable ratios

03 Why data centres are buying hybrids

04 Battery and solar revenue movements

05 How Broadsound solar-plus-BESS dispatched on two different days

The hybrid pipeline is shifting from retrofits to greenfields



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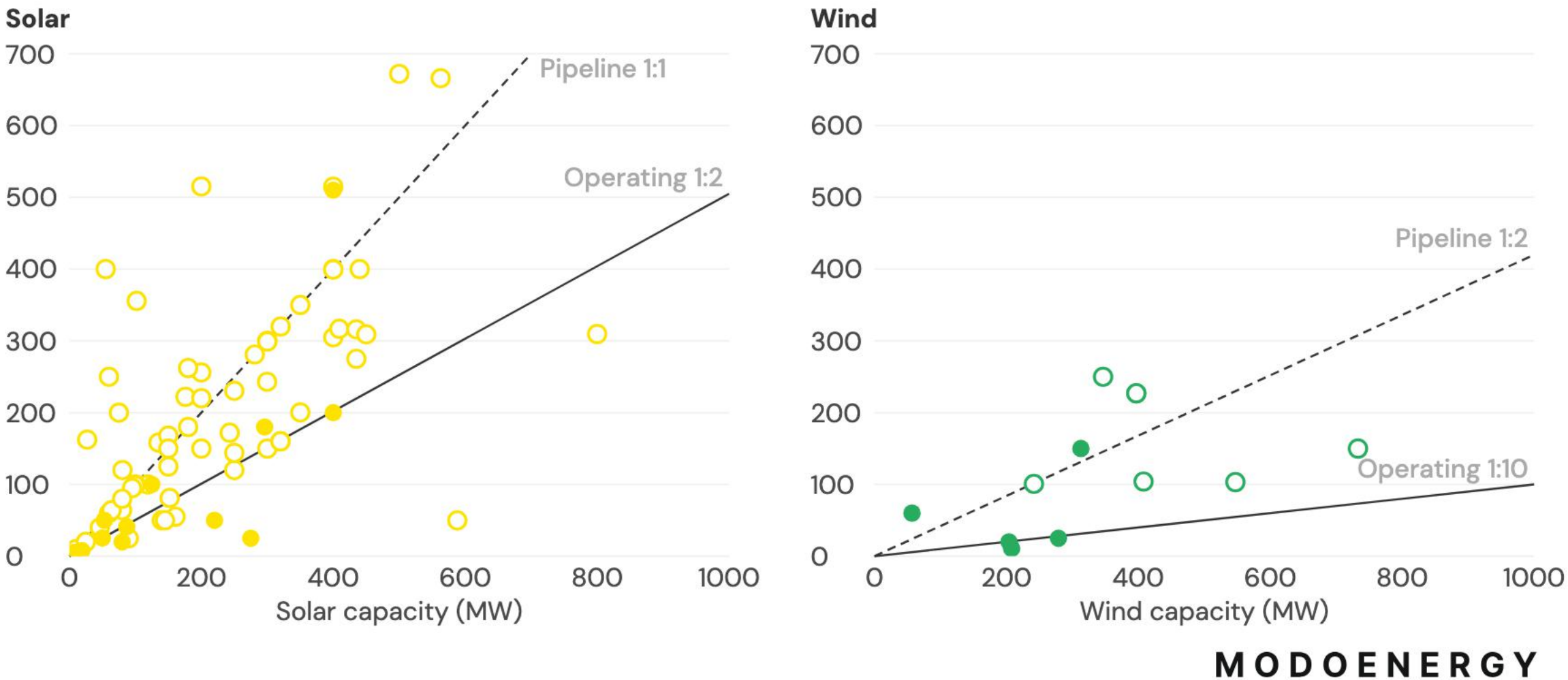
Batteries are half the solar at operating hybrids, and one to one in the pipeline

Battery capacity at each site (MW)

● Operating ○ Pipeline (committed and planning)



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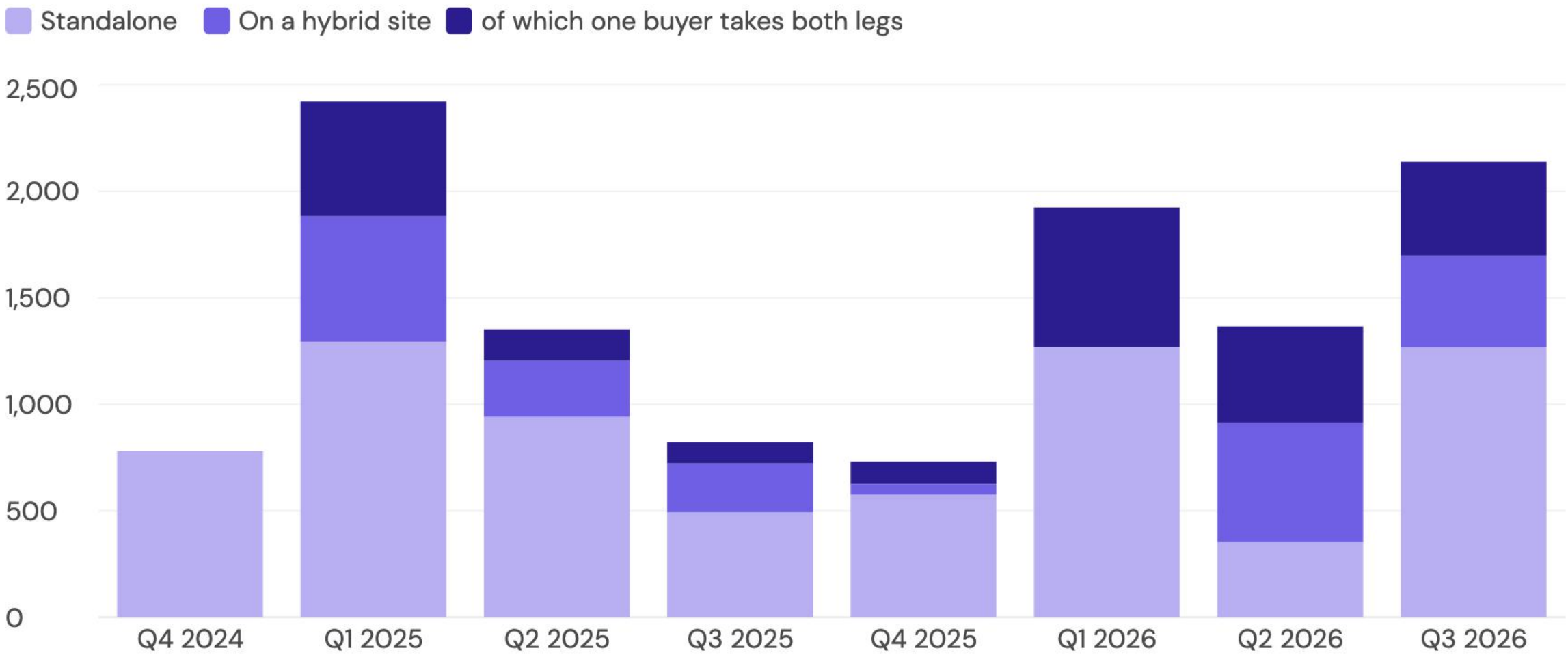
One buyer took both legs on 17% of capacity in 2025 and 29% this year

Wind, solar and battery capacity contracted each quarter, hybrid sites darker (MW)



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Data centres took a quarter of the capacity contracted in 2026, half of it on hybrid sites

Capacity contracted by buyer group and year, hybrid sites in the darker shade (GW)



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Data centre regulations in the NEM could buy 17% of renewable growth by 2035

Contracted new capacity by state at 90% cover with gas, 2035 (GW)



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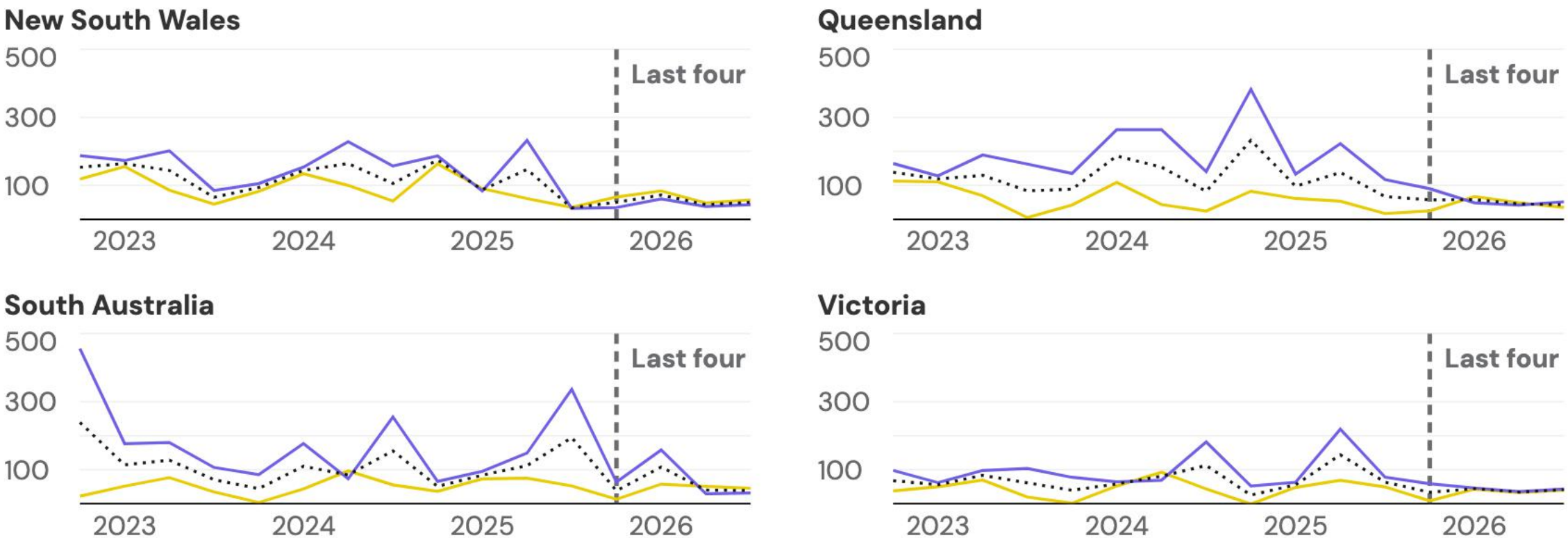
Until 2026, batteries earned more than solar

Quarterly merchant revenue per MW of fleet, annualised ($k/MW/year)

Solar and batteries | With wind

Solar — Battery — Wind --- Solar and battery, equal MW



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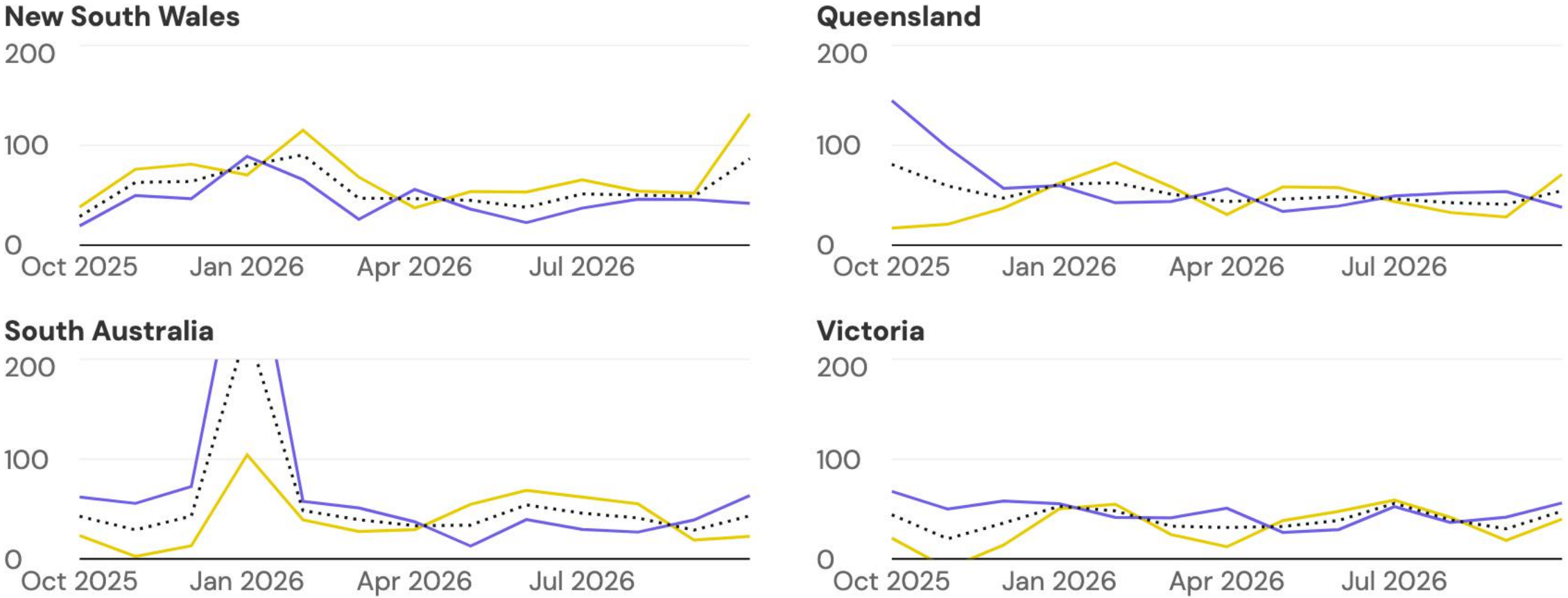
The combination has less downside than either leg

Monthly merchant revenue per MW of fleet, annualised ($k/MW/year)

Solar Battery Solar and battery, equal MW



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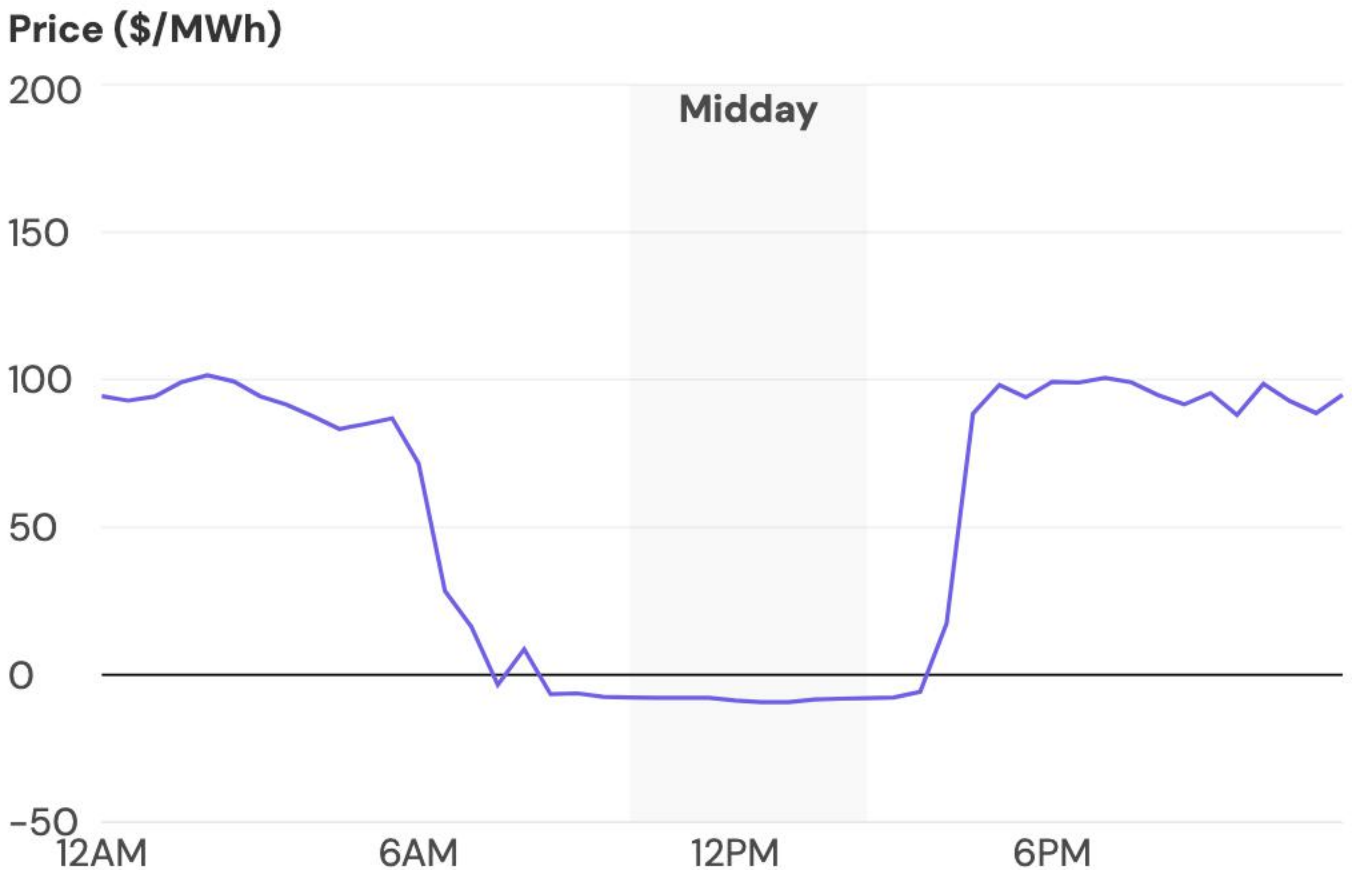
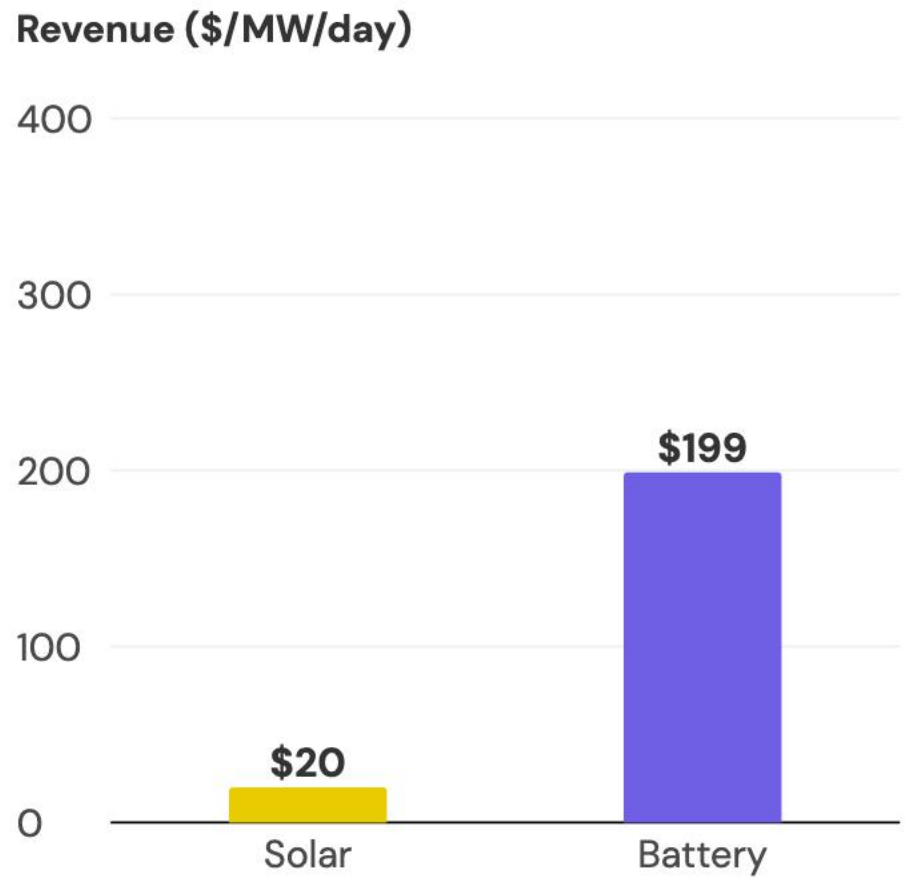
A midday dip: Queensland batteries earned $199 a MW, solar $20

2 October: Duck curve day

Price, 2 October 2026 Solar Battery





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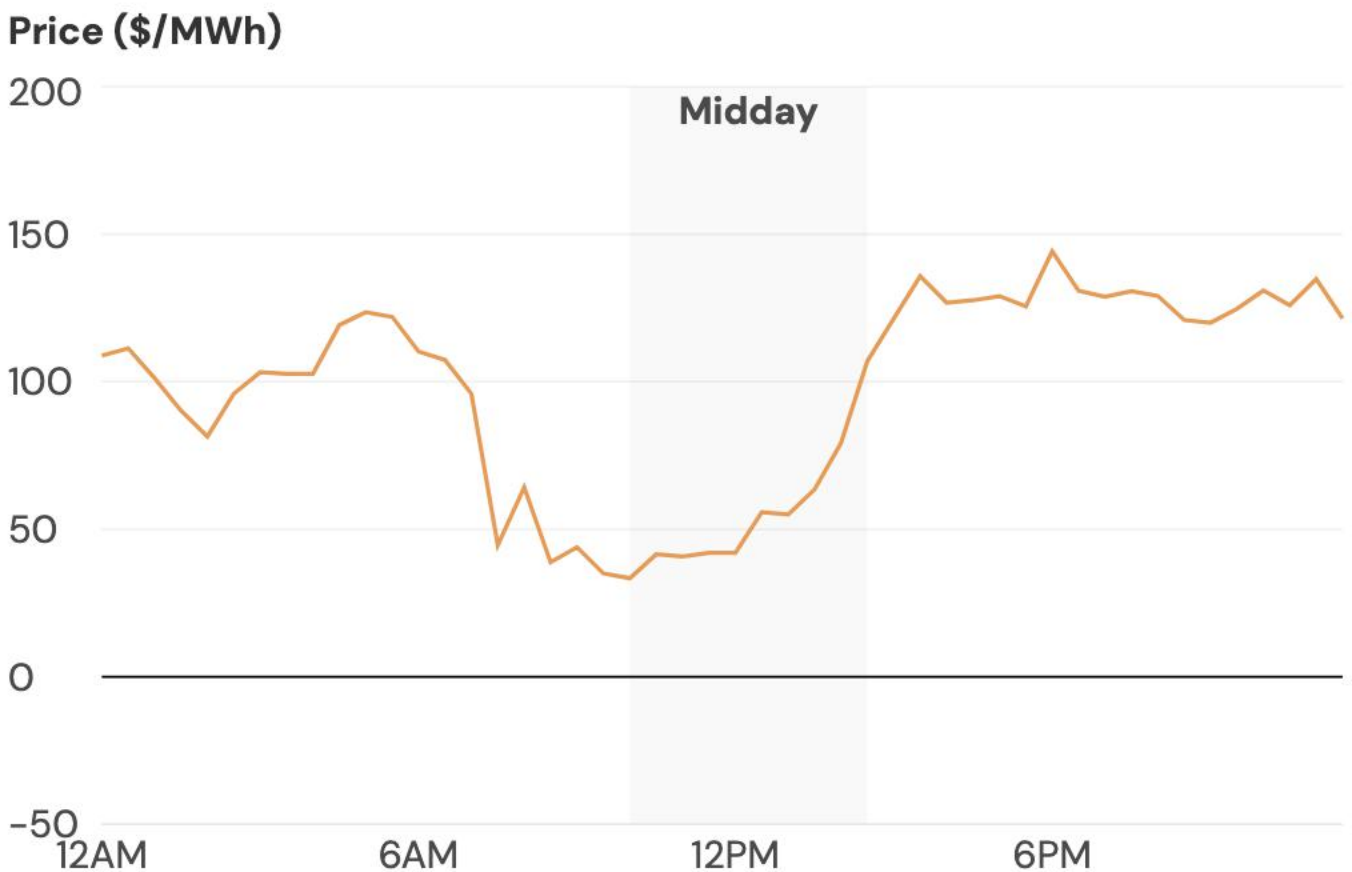
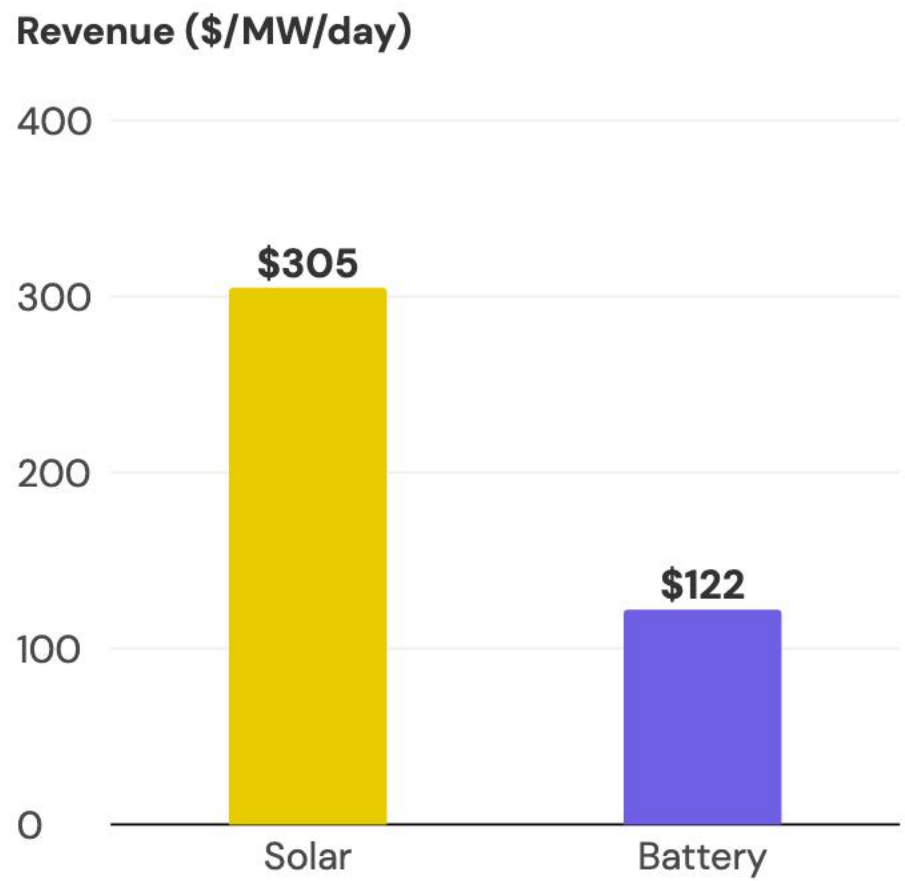
The midday held: Queensland solar earned $305 a MW, batteries $122

5 October: Held midday prices

Price, 5 October 2026 Solar Battery





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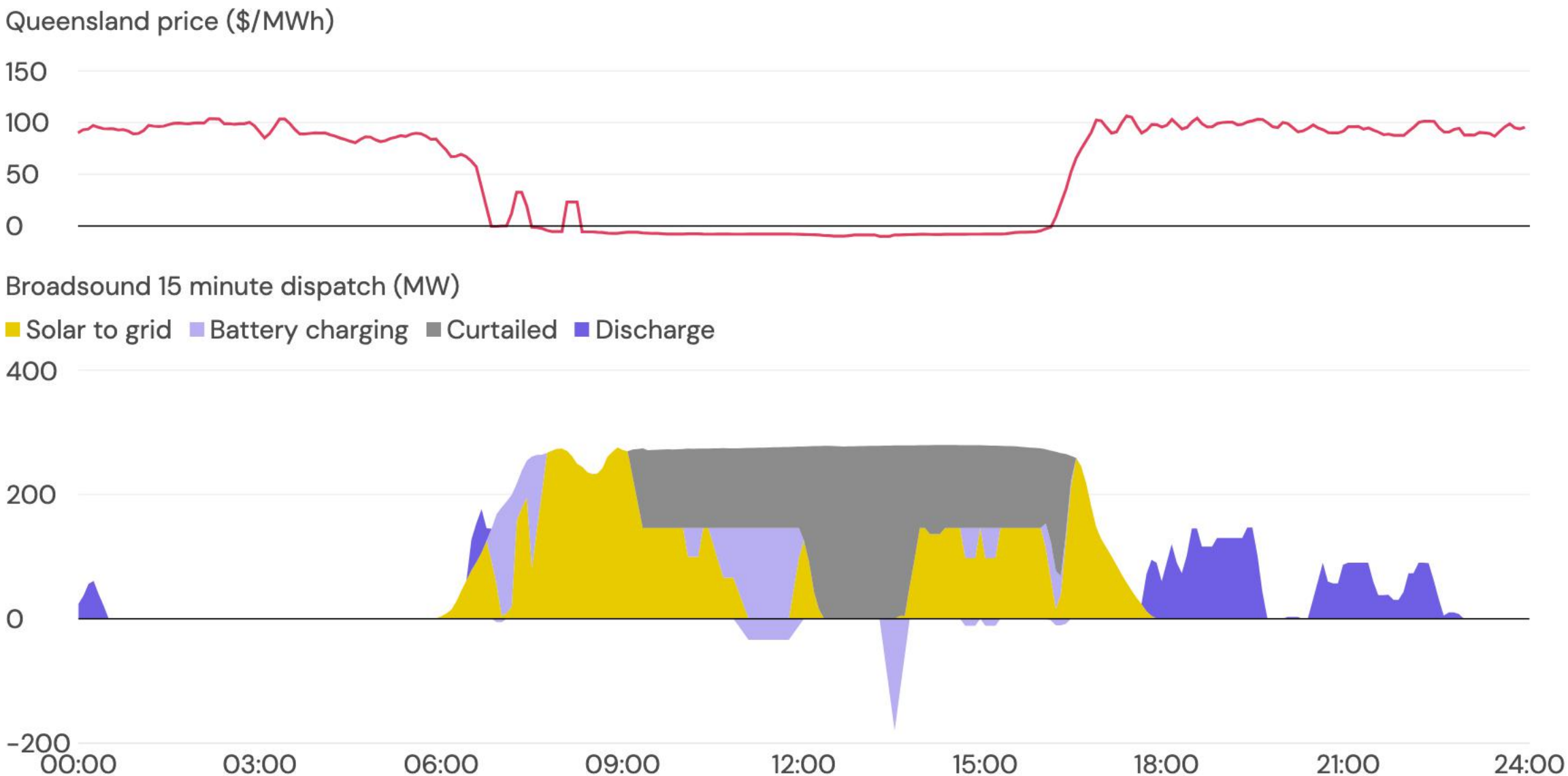
The dip day at Broadsound: 43% of the solar curtailed, the battery made $41k



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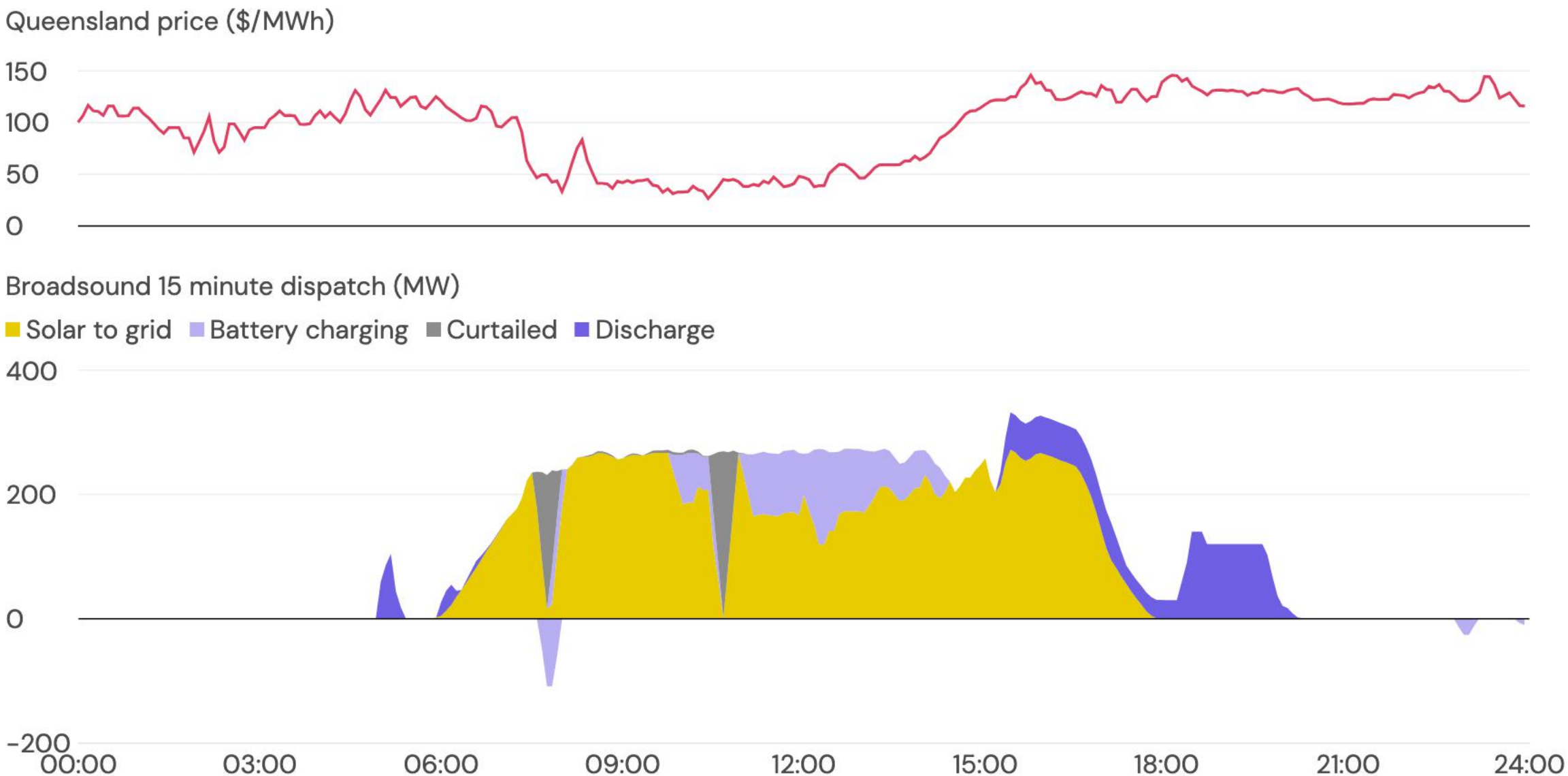
The held day at Broadsound: the solar made $177k, the battery $29k



Five things to take away

01 Solar hybrids are now built greenfield, not as retrofits: the NEM needs generation as well as storage

02 Solar's case for storage is stronger than wind's

03 Data centres are a growing share of buyers, and need a blend of renewables, batteries and gas

04 Solar surplus favours batteries, battery surplus favours solar: the pair hedges one against the other

05 A solar and battery hybrid runs like two standalone assets at one connection point

How we model a hybrid

Optimisation, sizing, coupling and the network

Tom Derrick
Lead Data Scientist

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What we will cover

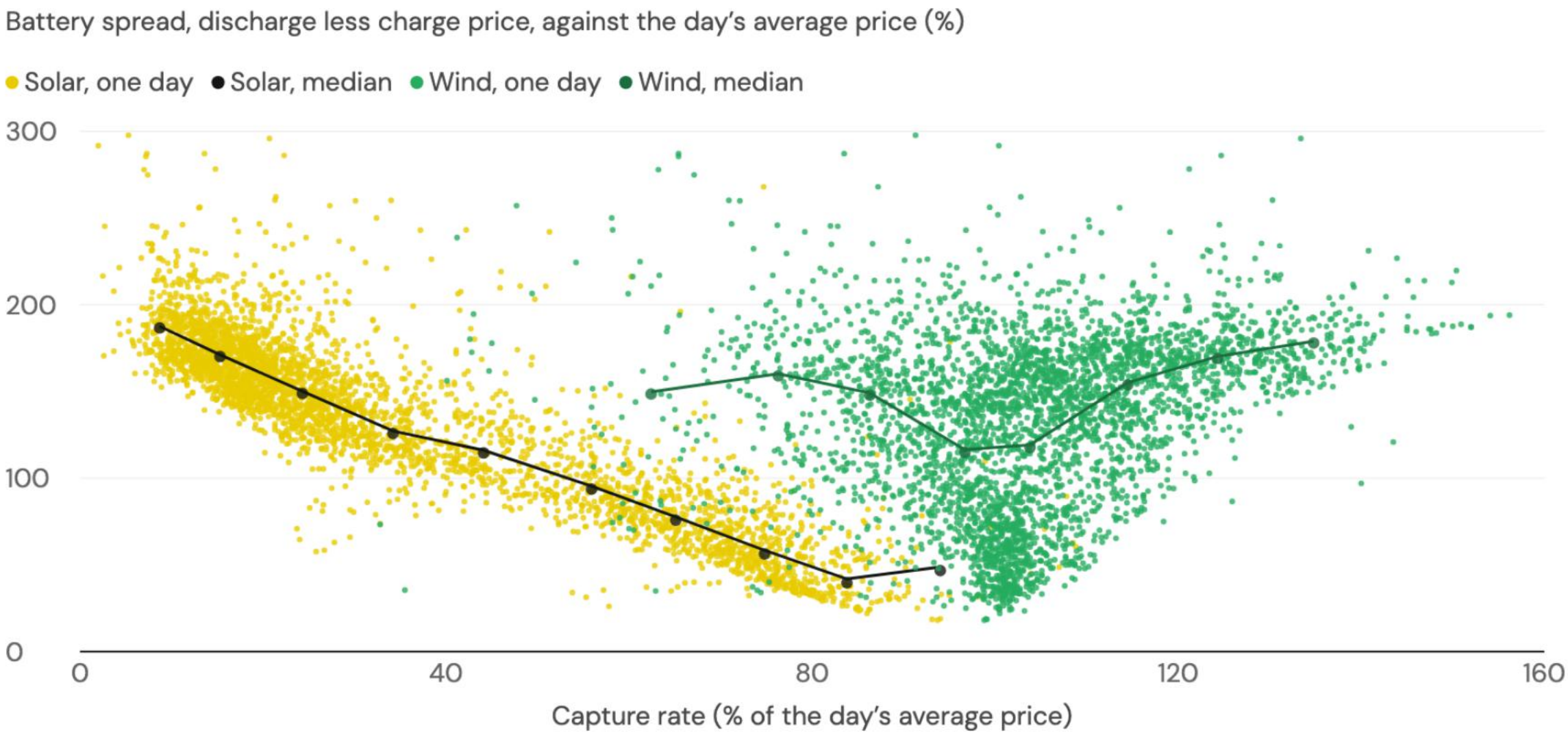
01 Why pair a battery with solar or wind

02 How our forecast optimises a hybrid

03 Adding a battery to an existing site: size and coupling

04 What the network does, and what a battery changes

When solar captures more, the battery's spread shrinks



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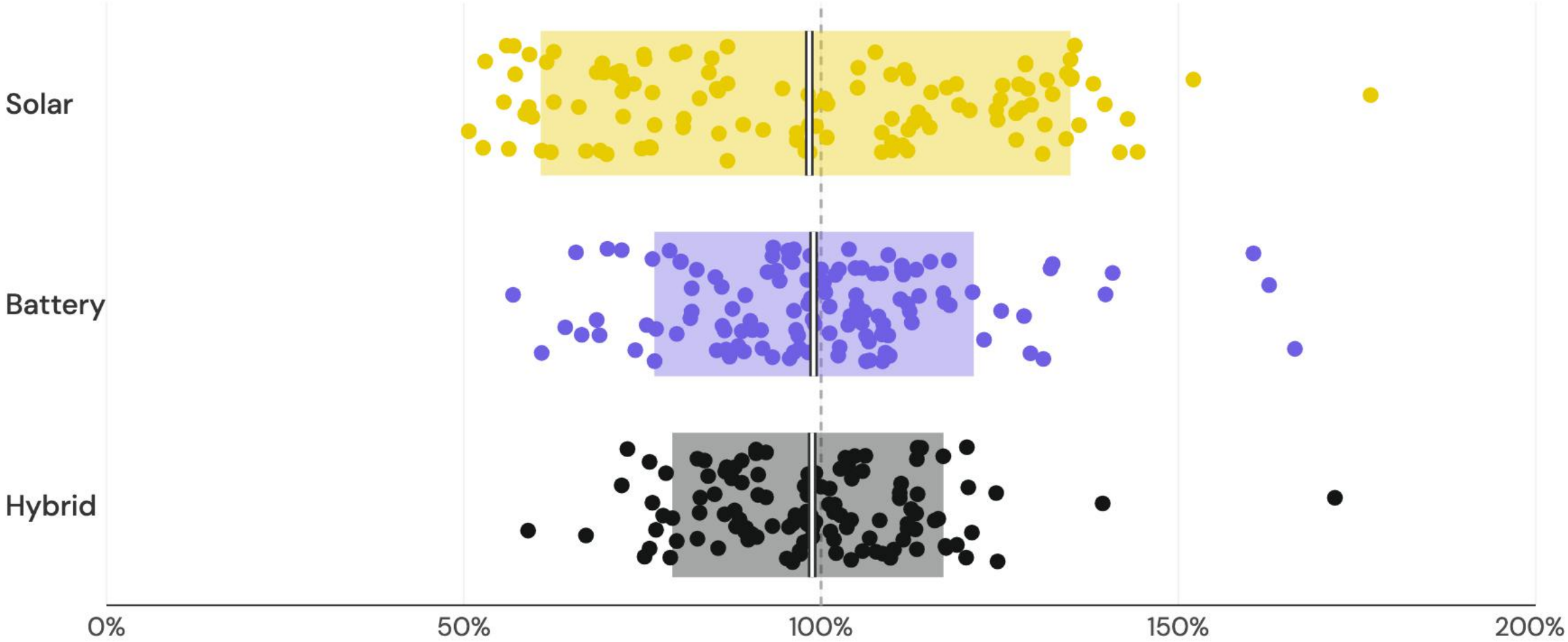
A hybrid's monthly revenue swings the least

Monthly revenue per MW against that calendar month's average (%)



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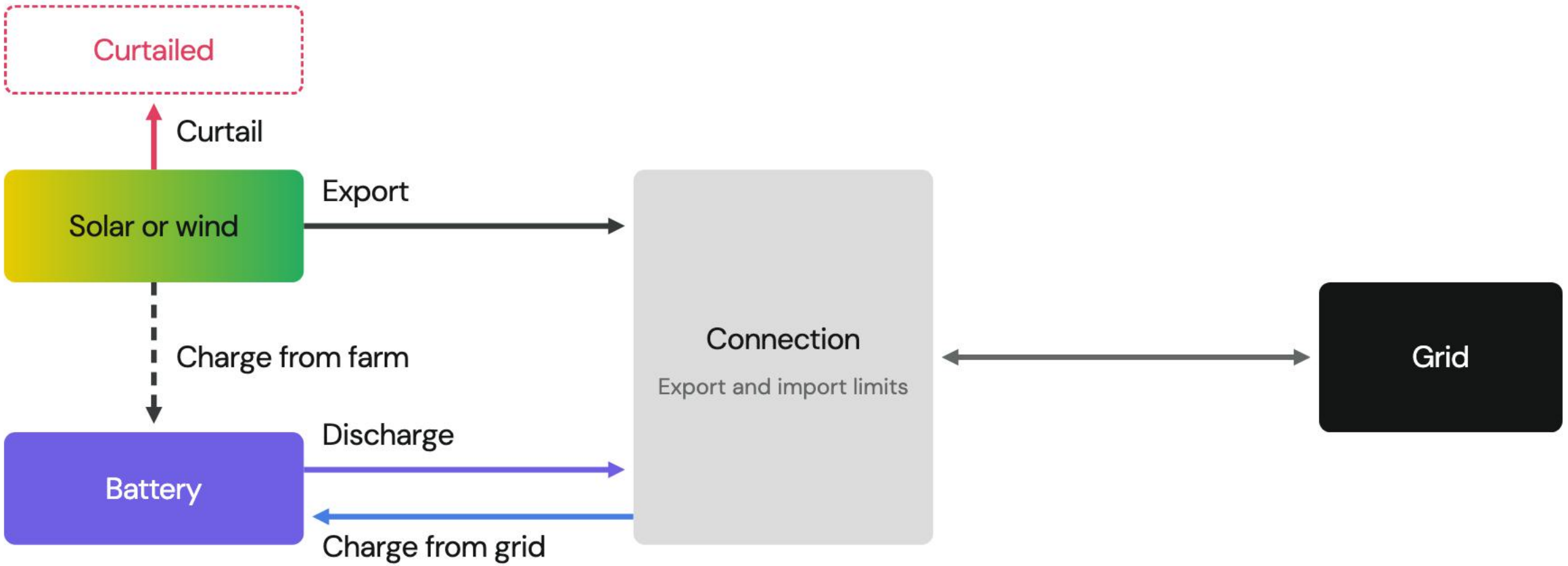
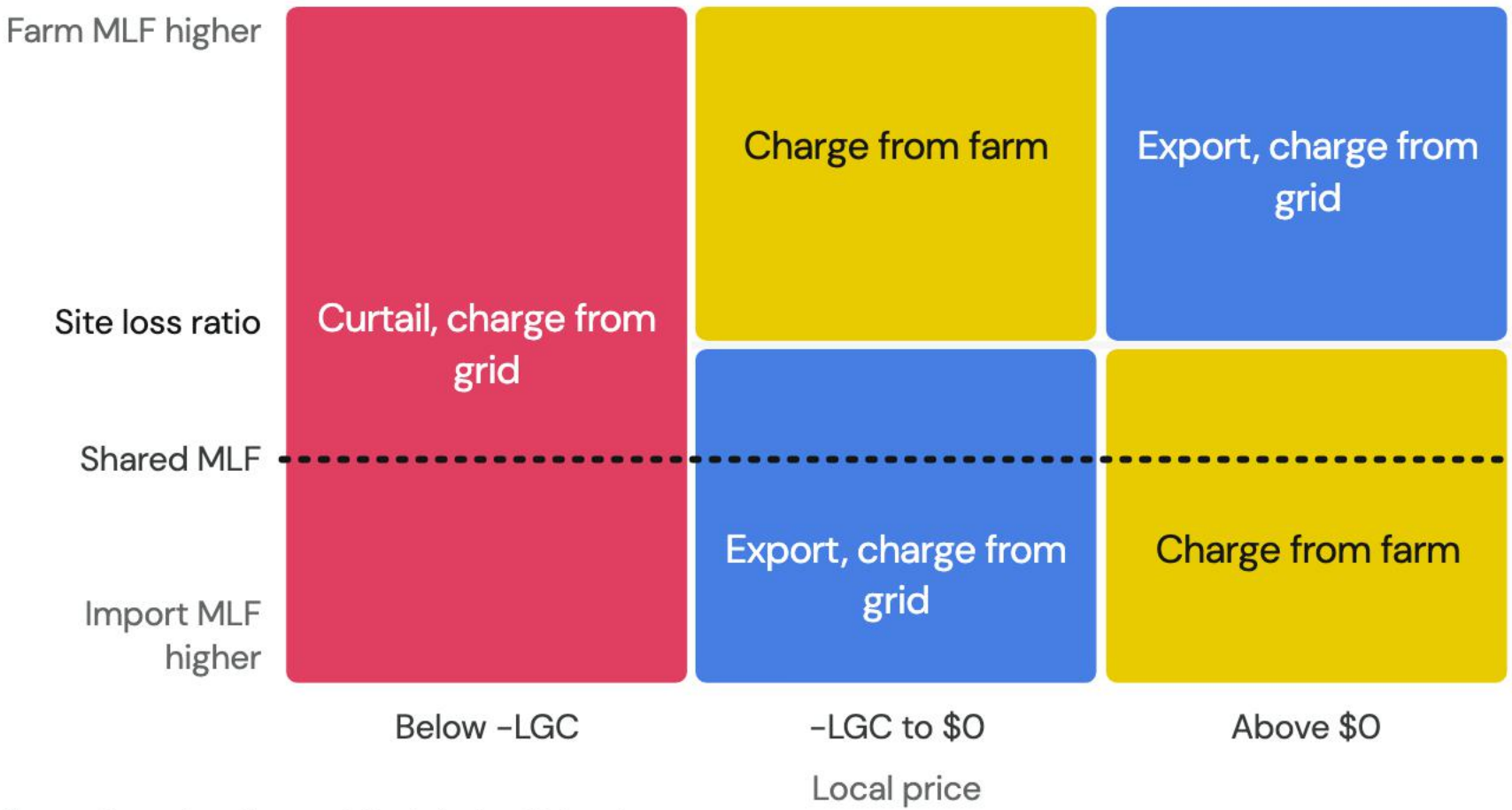
What does the optimisation problem look like?



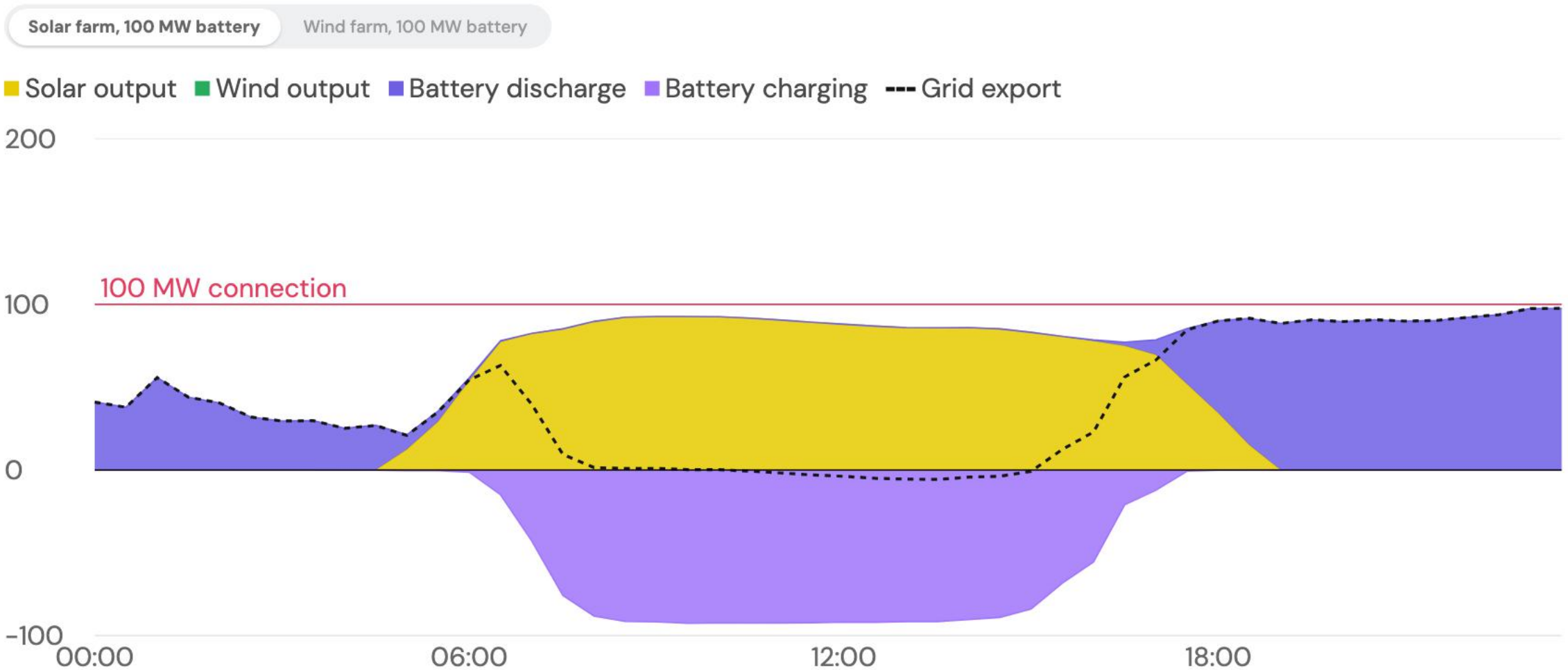
Charge from the farm above $0, from the grid below



Illustrative, using the model's default efficiencies.

A solar farm leaves room on its connection for a battery, a wind farm much less

Average output on the farm's highest-output quarter of days, 2030 to 2039 (MW)



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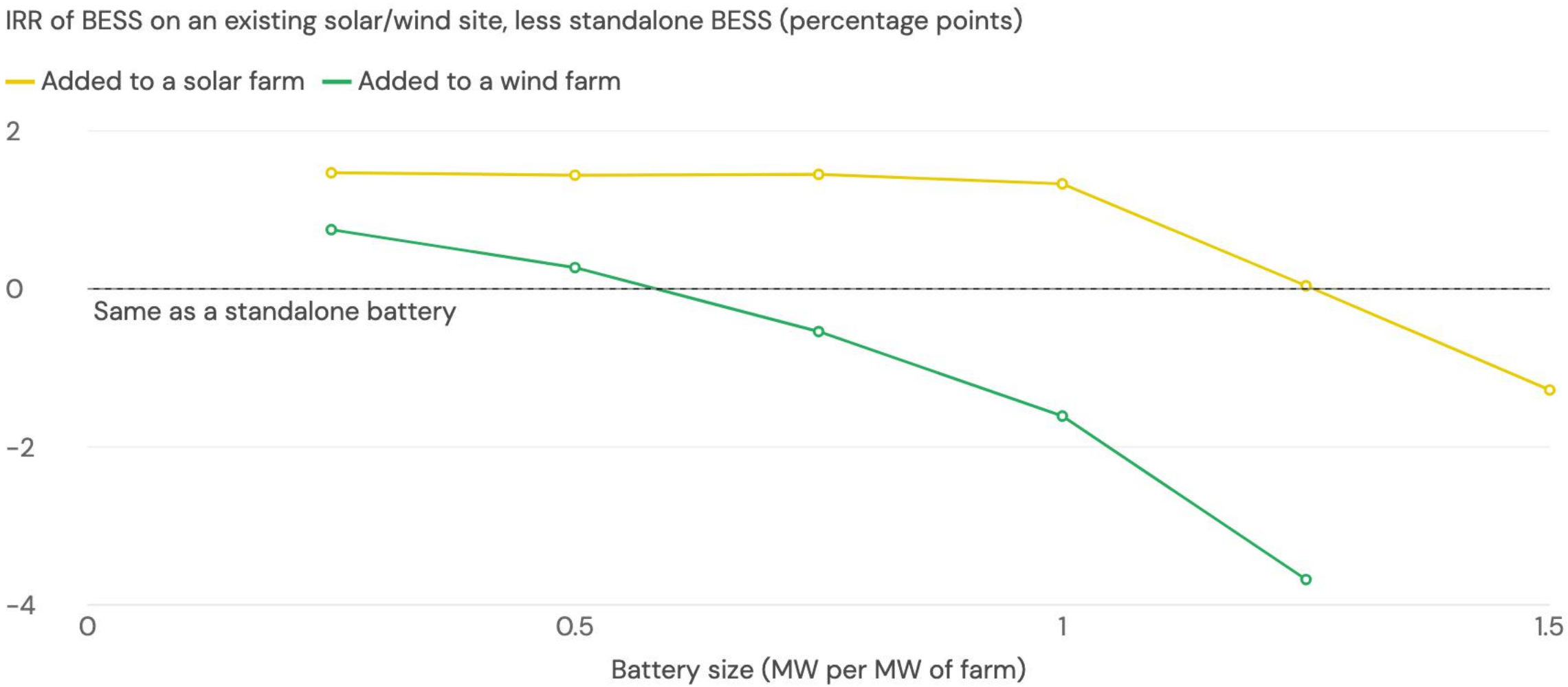
Batteries should be sized up to the size of the grid connection when paired with solar



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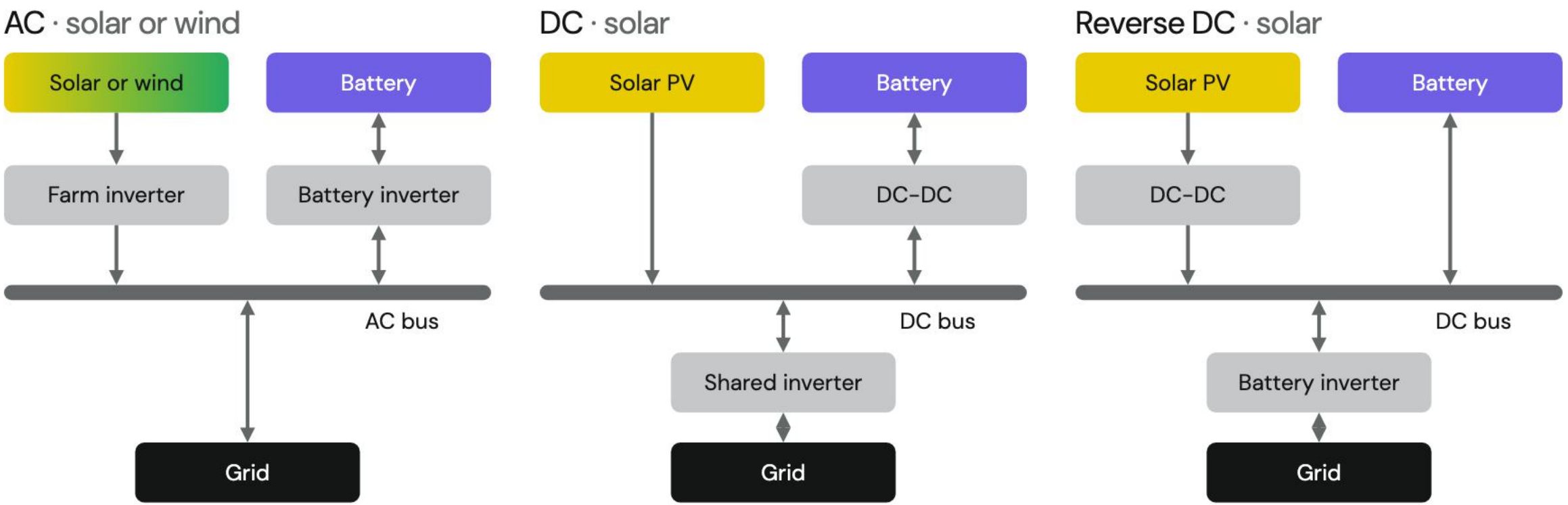
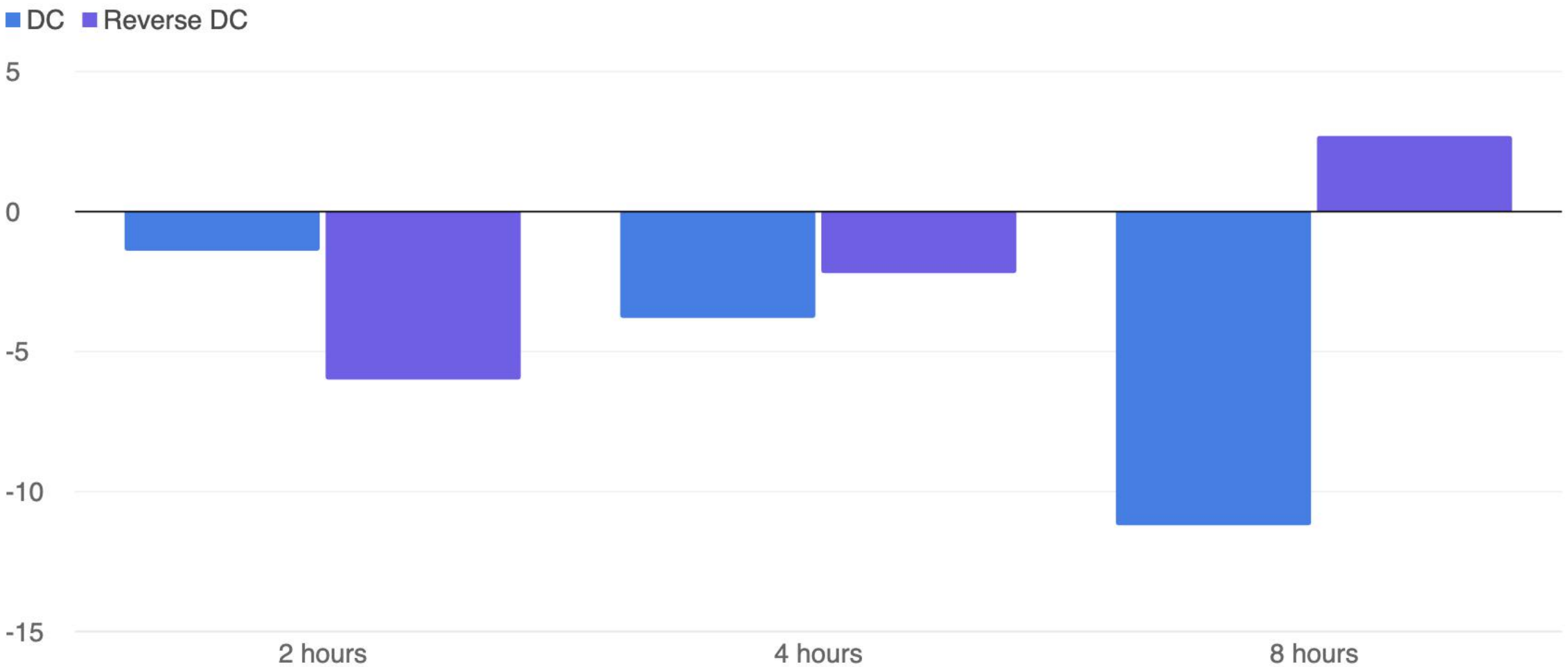
Three ways to couple a hybrid



Short batteries suit AC, long batteries suit reverse DC

Project IRR against an AC-coupled hybrid, 100 MW battery (basis points)



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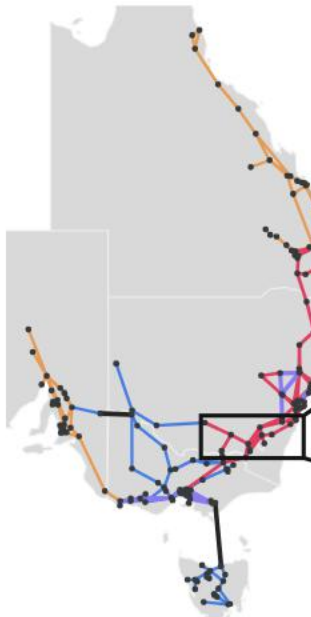
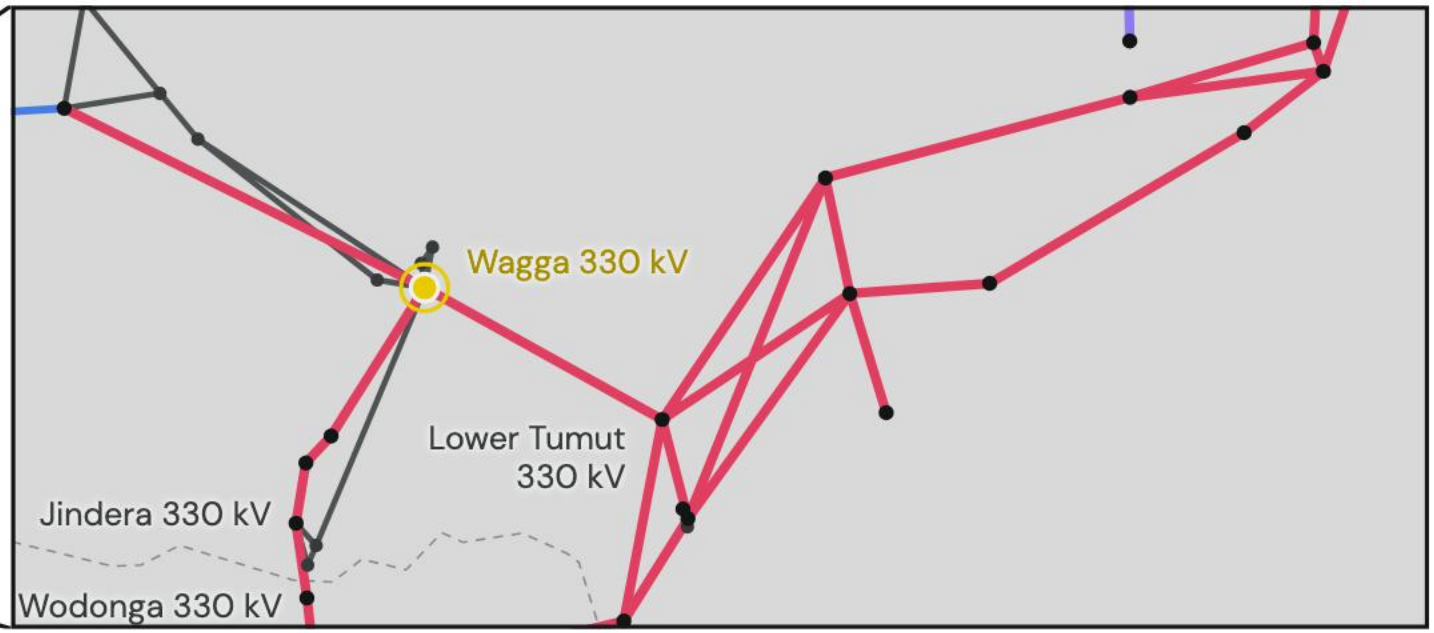
The grid model: what the network does to a project

Nodal forecast



Forecasts NEM dispatch
and prices at 200+ nodes

Grid model



Uses the forecast's dispatch and prices to model
local flows down to 132 kV under N-1 limits

500 kV 330 kV 275 kV 220 kV 132 kV HVDC

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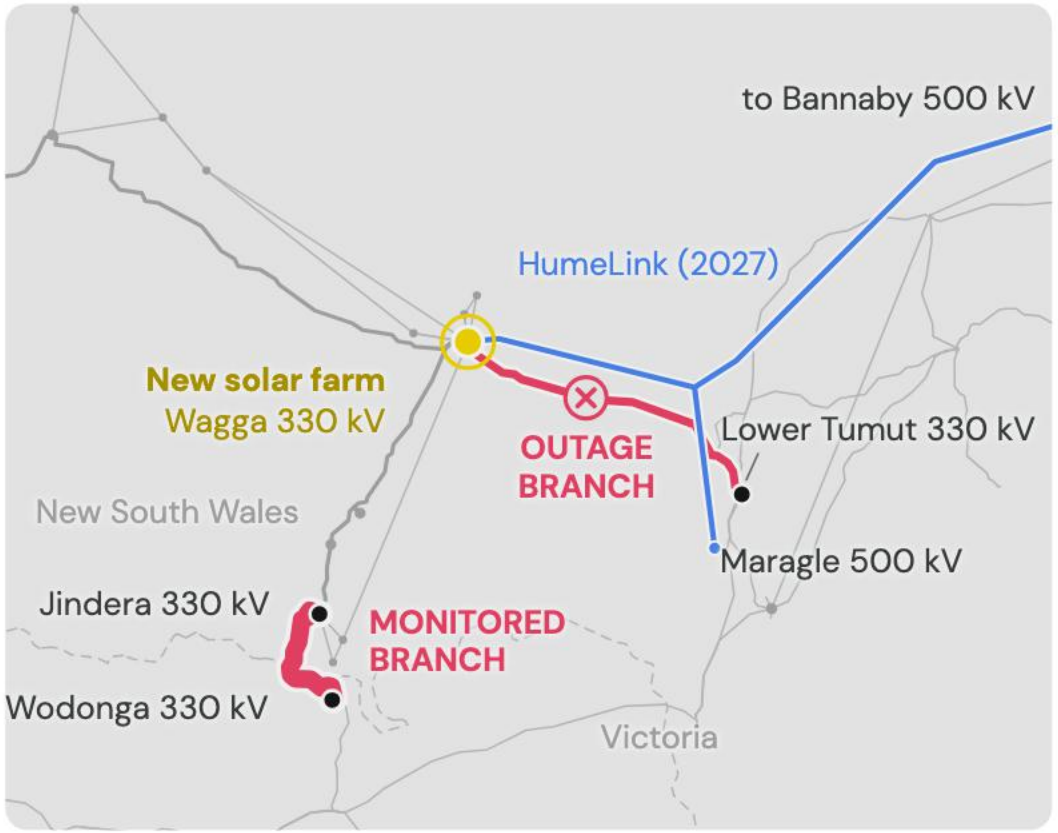
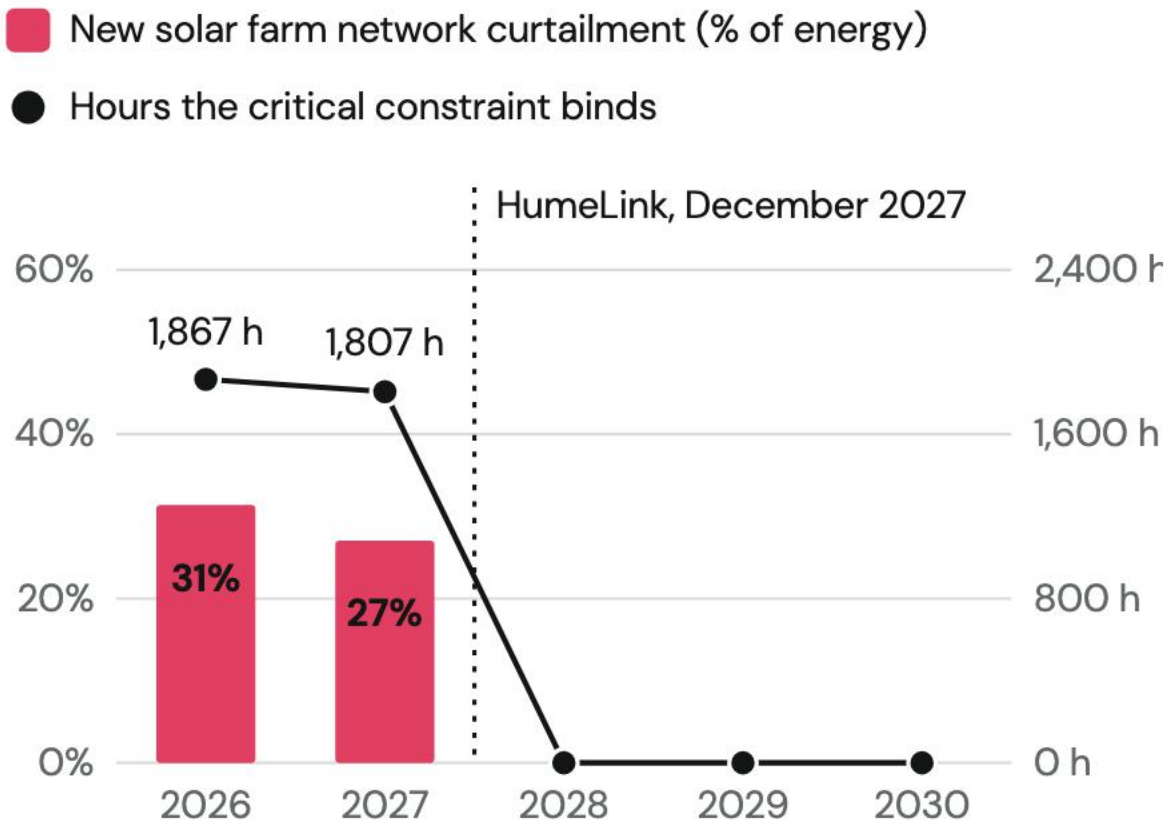
One constraint cuts 27–31% of output until HumeLink





Critical constraint: Jindera 330 kV to Wodonga 330 kV, on outage of Wagga 330 kV to Lower Tumut 330 kV

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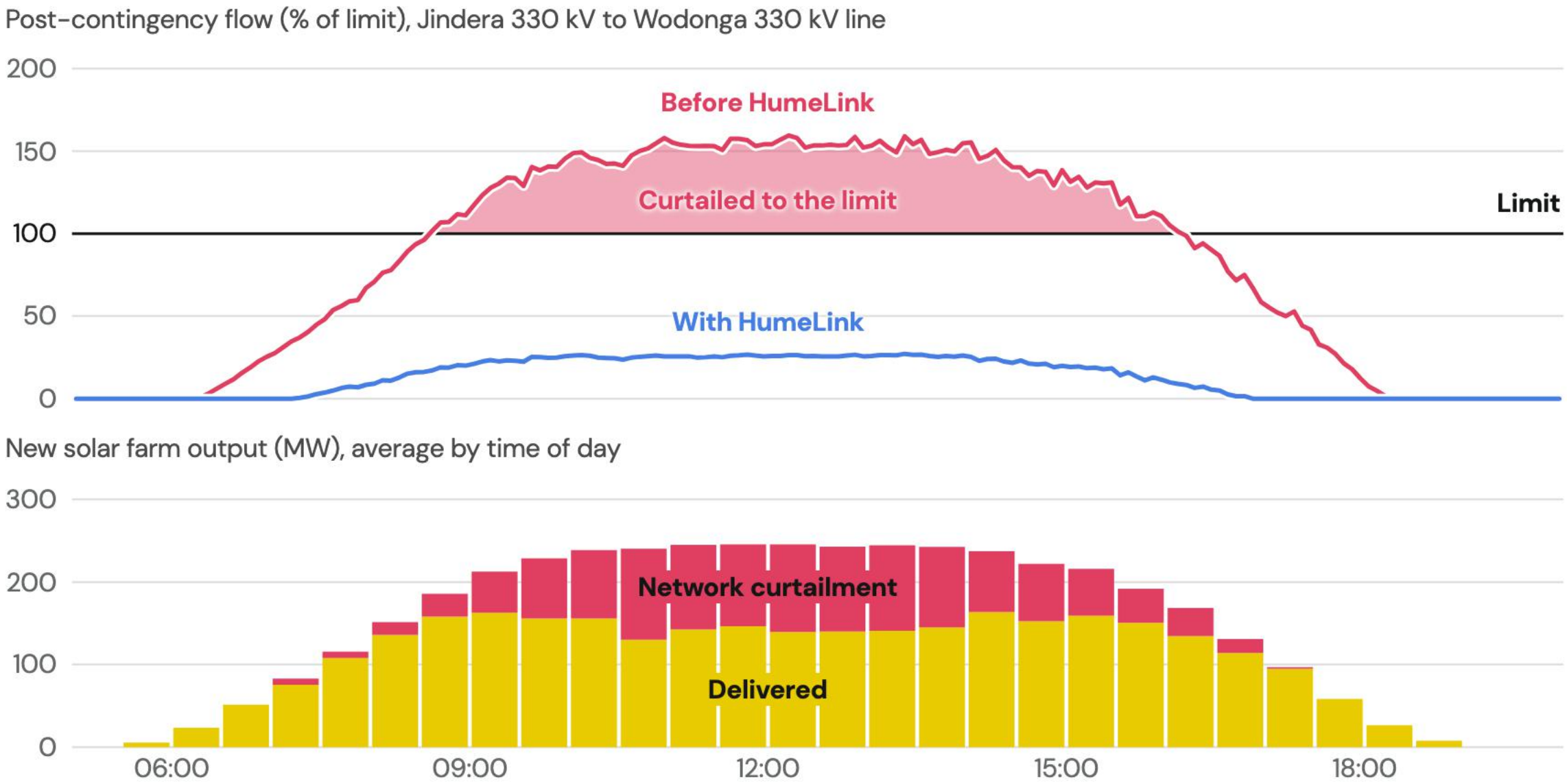
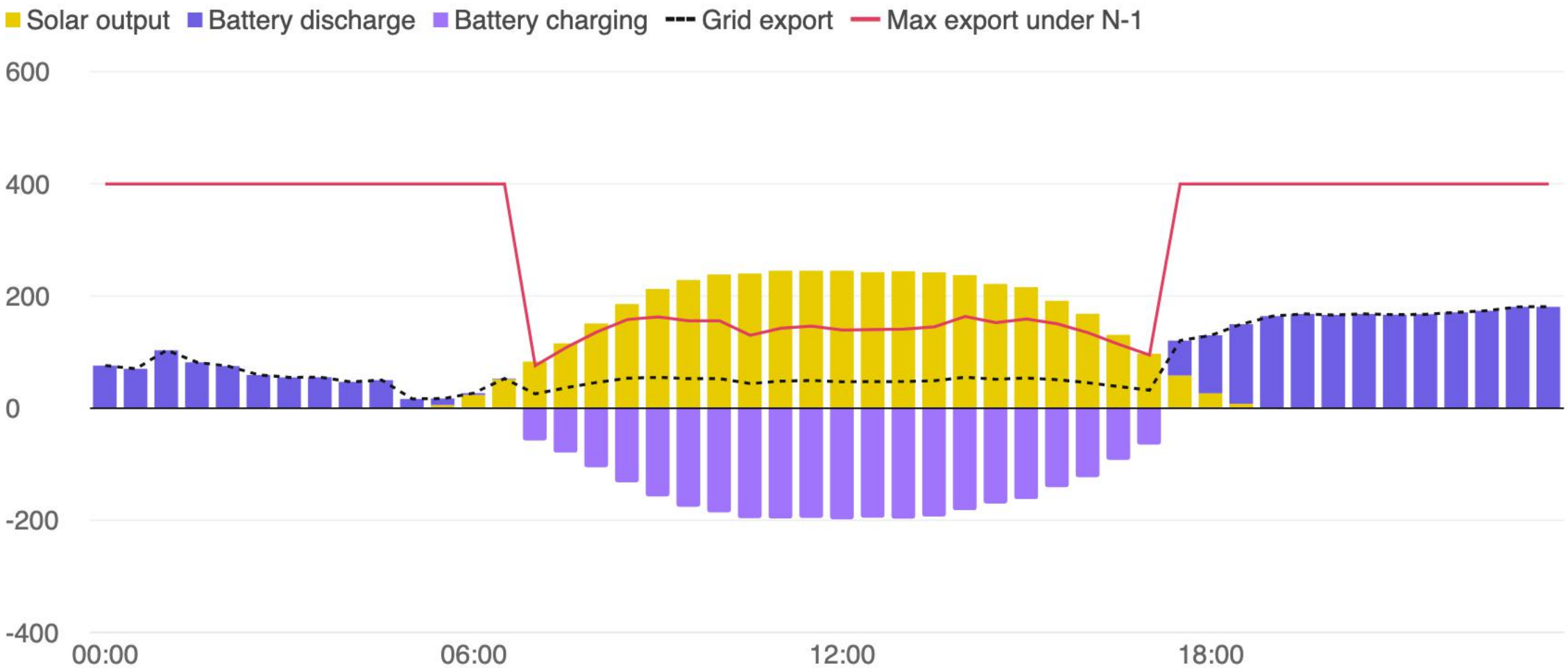
Before HumeLink, the farm loses 42% of its midday output



A battery stores the midday curtailment and exports it in the evening

New Wagga solar farm with a 400 MW, four-hour battery, average day before HumeLink (MW)



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What to take away

01 Solar and battery profiles are complementary, creating the opportunity to hedge revenues. Wind output overlaps more with battery discharge, increasing competition for the shared connection.

02 In our modelling, pairing can outperform a standalone battery up to the connection size alongside solar, and around half that alongside wind.

03 Coupling depends on size and duration: AC tends to suit smaller or shorter batteries, while reverse DC becomes more attractive with longer duration and a larger solar array.

How we can help with advisory services

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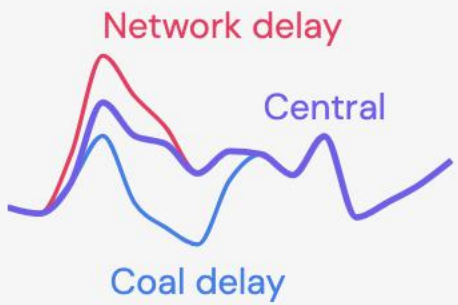
Supporting commercial due diligence and asset financing across the NEM and WEM

Custom scenarios

Price by year ($/MWh)

— Scenario trajectory



Stress test your hybrid or portfolio against a range of custom scenarios

Contracting assessment

Revenue ($k/MW/year)

BESS Solar — Fair value



Compare offtake structures and assess fair contract value

Data centre power

Cost, 2030 ($/MWh)

Grid Opex Capex

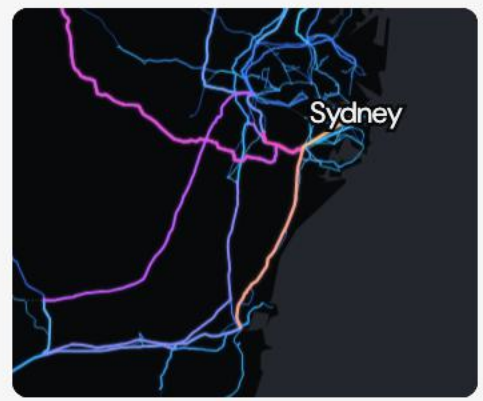


Model the least-cost supply mix for a data centre campus

Congestion analysis

P90 (% of limit)

0% 100%



Optimise your project or portfolio to manage constraints

4 GW+

Assets supported in transactions

$3.5Bn+

Transactions financed with our curves

Global services

Market analysis across Australia, Europe and the US

Key takeaways

01 / MARKET UPDATE

Batteries have compressed spreads

The pipeline is shifting towards longer-duration batteries and hybrid assets.

02 / HYBRID LANDSCAPE

Solar and batteries balance revenue exposure

Greenfield hybrids are growing, with data centres an increasingly important buyer.

03 / HYBRID MODELLING

Hybrid value depends on design and location

Model sizing, coupling and network constraints together to capture the site's value.