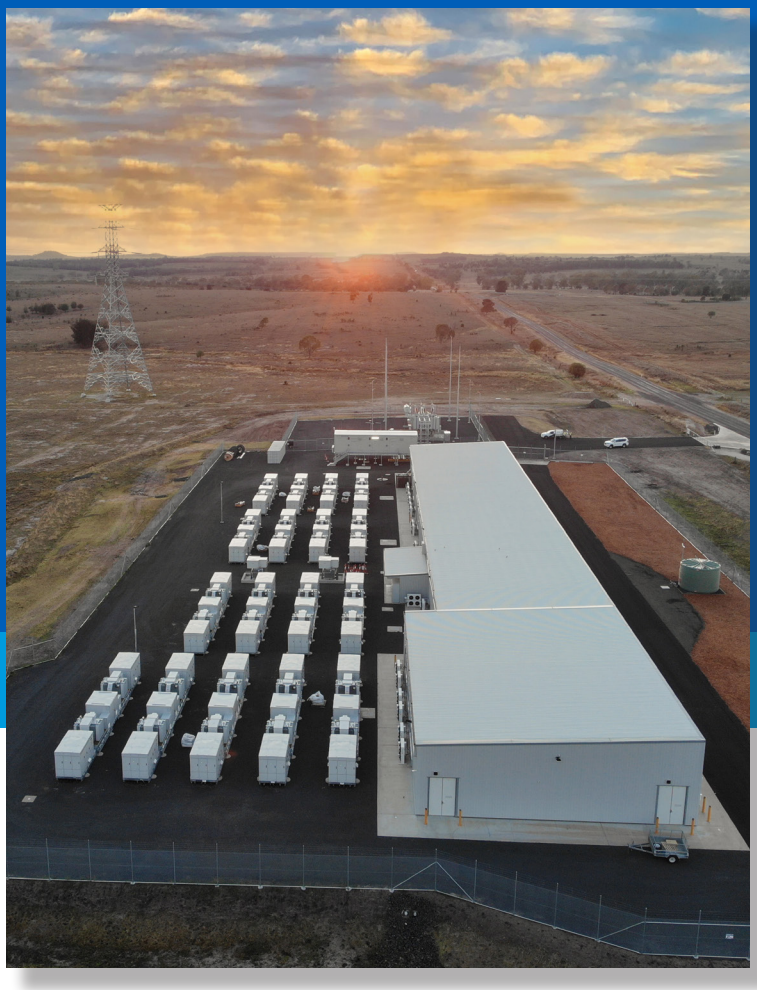
DOOSAN GridTech

WANDOAN SOUTH BESS

Capacity
100MW / 150MWh

Location
Queensland, Australia



PROJECT CASE STUDY

Australia's First Utility-Scale Battery in Queensland

About the Client

Vena Energy is one of Asia-Pacific's leading renewable energy companies, with a portfolio of solar, wind, and battery storage projects across the region. Headquartered in Singapore, the company develops, constructs, and operates utility-scale renewable energy assets that drive the clean energy transition.

In Australia, Vena Energy is pioneering large-scale storage. The Wandoan South BESS is its first grid-scale battery project in the country and a cornerstone of its strategy to integrate renewable generation with flexible, dispatchable resources.

The Challenge: Stabiizing a Renewable-Rich Grid

Queensland has some of the world's highest levels of solar penetration. While this drives abundant clean energy, it also creates operational challenges:

- Midday oversupply and negative pricing caused by excess solar generation.
- Evening demand peaks after the sun sets.
- Frequency and voltage fluctuations due to variable renewable output.

The Wandoan South BESS was developed to address these issues, comply with Australia's stringent Generator Performance Standards, and provide a flexible, market-ready solution to support the National Electricity Market (NEM).

Client	Role	Commissioned	Market
Vena Energy	EPC & System Integrator	2021	Australian NEM

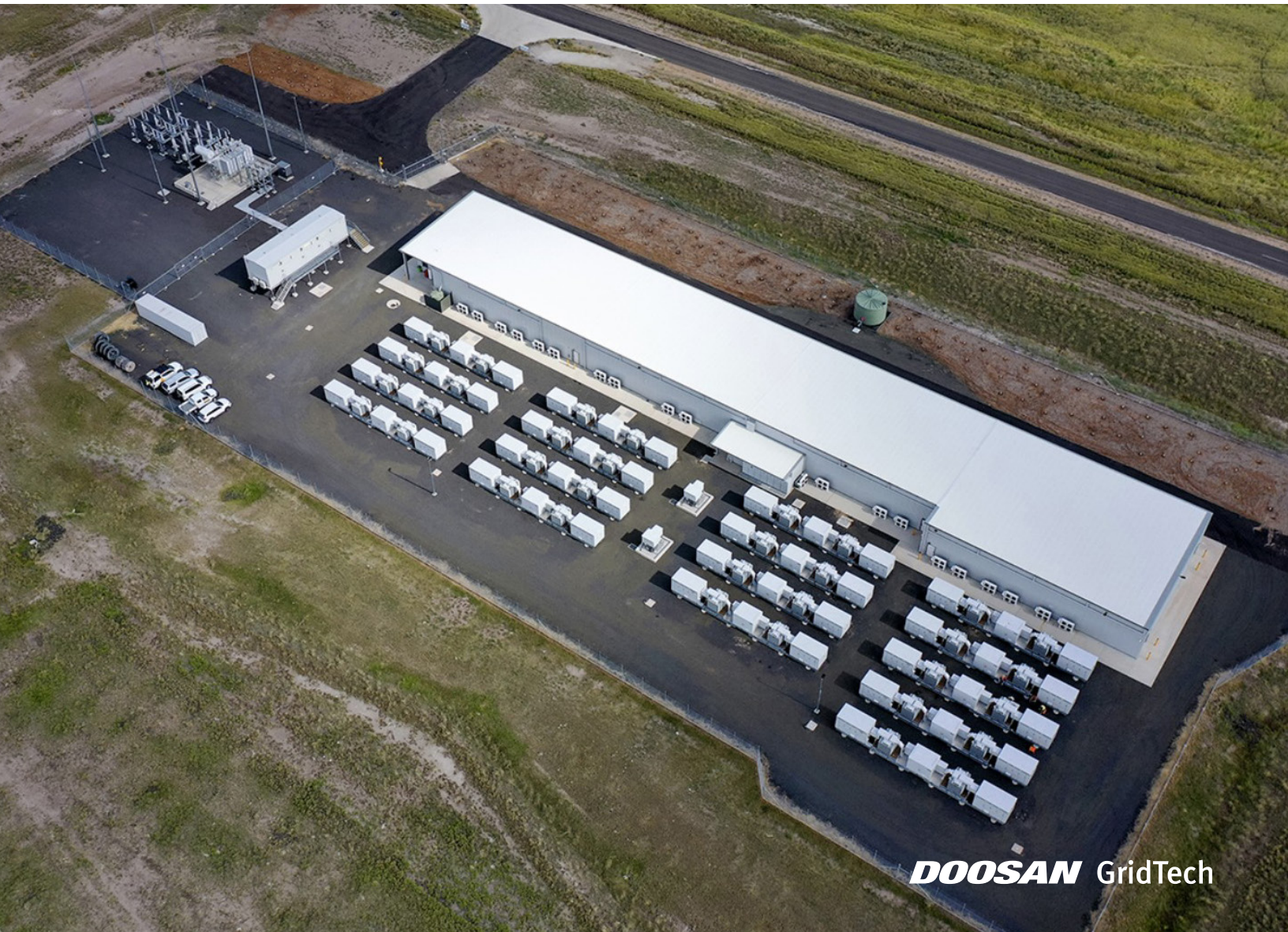
Doosan GridTech's Solution

Doosan GridTech served as system integrator and EPC partner, delivering a turnkey solution covering design, engineering, procurement, testing, construction, and commissioning.

At the heart of the project is the Doosan GridTech Intelligent Controller® (DG-IC®), a vendor-agnostic power plant controller built on open standards. The DG-IC® ensures safe operations, intelligent charge/discharge, optimized market dispatch, and compliance with NEM requirements.

Core Solution Elements

- **Turnkey delivery:** End-to-end EPC and system integration.
- **Battery system:** Over 500,000 lithium-ion cells housed in a climate-controlled concrete building with centralized fire and cooling management. This lowers auxiliary load and ensures performance in harsh Queensland conditions.
- **Inverters:** 34 outdoor inverter stations, preloaded with Black Start and System Restart Ancillary Services, an uncommon capability in most BESS projects.
- **Performance standards:** Net output of 100MW at 0.93 power factor, 150MWh discharge capacity, with full reactive power and voltage control at the 132kV connection point.
- **Advanced controls:** DG-IC® orchestrates market participation in energy shifting and Frequency Control Ancillary Services (FCAS).



Outcomes and Impact

Since commissioning in 2021, the Wandoan South BESS has demonstrated the far-reaching value of grid-scale storage:

- **Grid Reliability**: Provides ultra-fast frequency response, reactive power, and system restart services to keep Queensland's grid stable as renewable penetration grows.
- **Market Revenues**: Active in both energy arbitrage and FCAS markets, maximizing asset value and demonstrating the commercial viability of large-scale storage.
- **Sustainability**: Reduces reliance on fossil peakers by shifting solar into evening peaks, directly supporting Australia's decarbonization goals.
- **Resilience**: Enhances regional recovery with black start capability, an uncommon but vital grid restoration function.
- **Regional Economy**: Supported local employment by sourcing a majority of construction labor from Queensland; positioned the Western Downs as the "Energy Capital of Queensland."
- **Recognition**: Finalist in the 2022 Clean Energy Council Innovation Awards and awarded Battery Storage Deal of the Year at the 2021 Asset Triple A Infrastructure Awards.
- **Scalability**: Serves as a blueprint for future hybrid renewable + storage projects across the NEM.

Why This Project Matters

The Wandoan South BESS is more than Queensland's first utility-scale battery. It proves that large-scale storage can stabilize solar-rich grids, reduce costs, and enable the renewable transition.

By combining turnkey EPC delivery, advanced controls, and vendor-agnostic integration, Doosan GridTech delivered one of Australia's most impactful storage systems. The system strengthens Queensland's grid today while setting the benchmark for future projects nationwide.