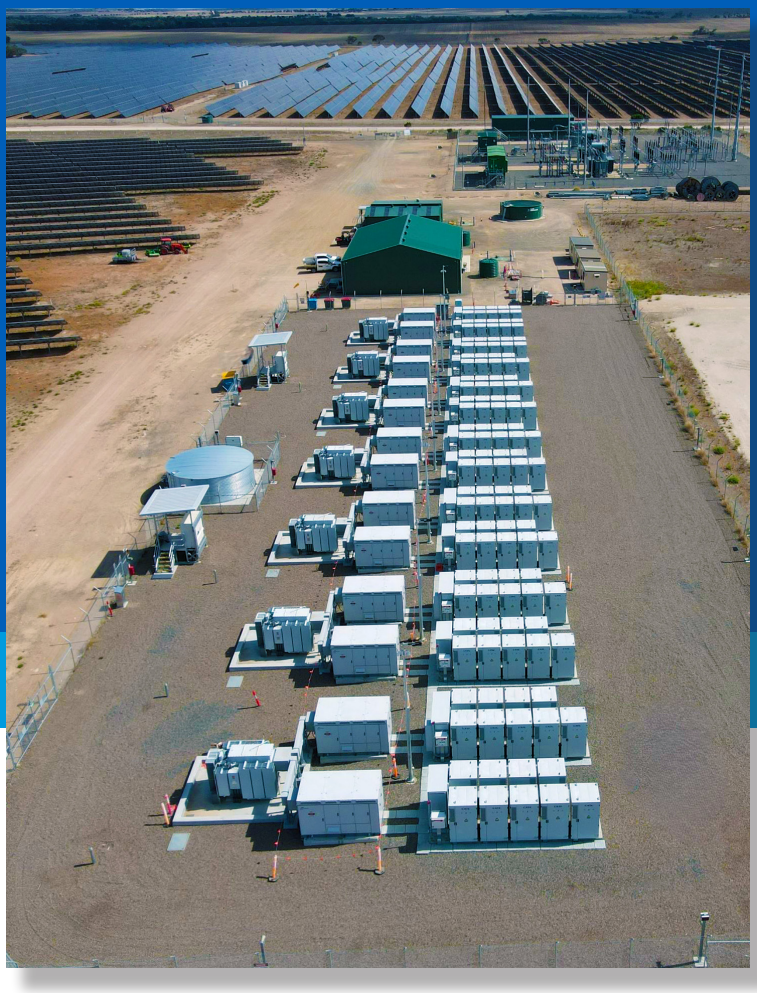
DOOSAN GridTech

TAILEM BEND II HYBRID BESS



Capacity
41.5MW / 41.5MWh

Location
Tailem Bend, South Australia

PROJECT CASE STUDY

Hybrid Renewable Innovation Advancing Grid Reliability in South Australia

About the Client

Vena Energy is one of Asia-Pacific's leading renewable energy companies, with a diverse portfolio of solar, wind, and battery storage projects across the region. Headquartered in Singapore, Vena Energy is committed to achieving net-zero emissions by 2030 and is recognized for pioneering hybrid renewable projects that combine dispatchable battery storage with large-scale solar generation.

In Australia, Vena Energy has played a major role in advancing South Australia's renewable transition through its Tailem Bend developments. The Tailem Bend II Hybrid BESS demonstrates how integrating battery storage with solar generation can maximize grid and market value while maintaining operational flexibility and reliability.

The Challenge: Unlocking Solar Value and Grid Flexibility

South Australia's rapid expansion of renewable generation has created one of the world's most solar-dense electricity networks. While beneficial for decarbonization, it has also introduced grid challenges such as:

- Midday over-generation and negative wholesale pricing dur to abundant solar supply.
- Curtailment risk, where solar generation exceeds grid export limits.
- Grid frequency and voltage fluctuations as fossil-based inertia declines.
- Infrastructure inefficiency, with limited ability to expand grid capacity

Vena Energy sought to overcome these challenges through a hybrid solution capable of storing surplus solar energy, dispatching it during peak demand, and supporting the National Electricity Market (NEM) with critical ancillary services.

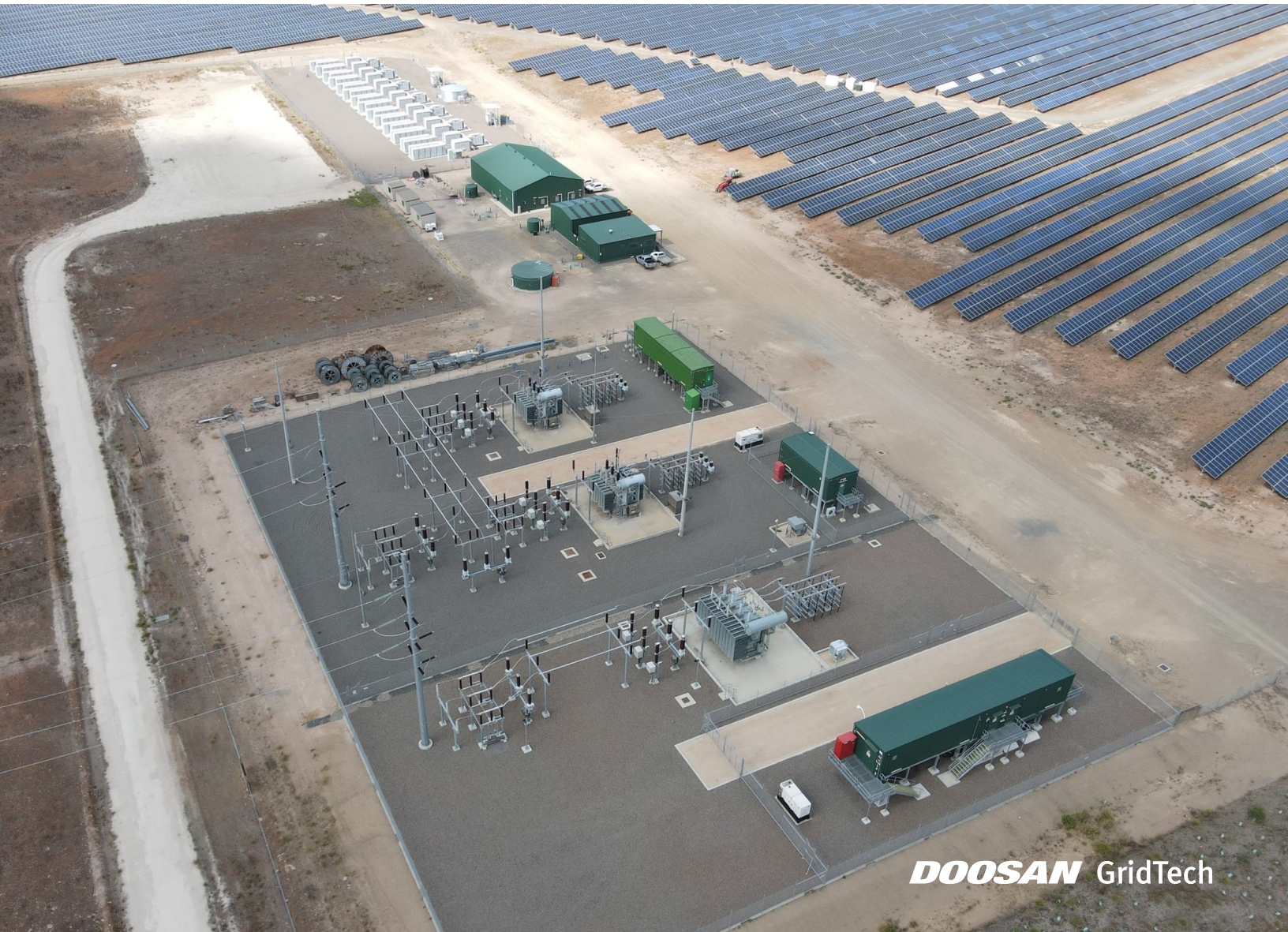
Client	Role	Commissioned	Market
Vena Energy	EPC & System Integrator	2024	Australian NEM

Doosan GridTech's Solution

Doosan GridTech, along with its parent company Doosan Enerbility, served as the EPC provider and system integrator for the 41.5MW / 41.5MWh Tailem Bend II Hybrid BESS, co-located with the 87MW Tailem Bend II Solar Farm, resulting in a combined hybrid capacity of 128.5MW.

Core Solution Elements

- **Battery System:** The project consists of liquid-cooled, weather-resistant outdoor cabinets that house the CATL lithium-ion battery modules. These cabinets are paired with Power Electronics inverters and connected through transformers to the Coorong 2 Substation, which links directly into the NEM.
- **Hybrid Design:** Both the solar and battery systems operate independently yet share a single grid connection, allowing each to be dispatched separately or jointly for optimal market participation.
- **Control Platform:** The Doosan GridTech Intelligent Controller® (DG-IC®) manages real-time coordination between the solar farm and BESS, optimizing charge and discharge cycles while providing frequency response in under 250 milliseconds.
- **Turnkey Delivery:** Doosan GridTech delivered complete EPC and integration services, including design, procurement, construction management, testing, commissioning, and performance validation.
- **Commissioning:** The project achieved full commercial operation in December 2024, marking a milestone in hybrid renewable energy development in South Australia.



Outcomes and Impact

The Tailem Bend II Hybrid BESS delivers substantial technical, environmental, and economic benefits for both Vena Energy and the South Australian grid.

- **Grid Stability:** Provides ultra-fast frequency control, reactive power, and voltage support to stabilize the regional grid during renewable fluctuations.
- **Renewable Integration:** Stores excess solar generation during midday and releases it during evening demand peaks, reducing curtailment and grid congestion.
- **Market Participation:** Competes in both wholesale energy and Frequency Control Ancillary Services (FCAS) markets, creating new revenue streams for Vena Energy.
- **Infrastructure Efficiency:** Maximizes the use of a single grid connection, avoiding additional transmission infrastructure costs.
- **Environmental Impact:** Powers approximately 38,000 homes annually and helps avoid nearly 223,000 tons of CO_2 emissions per year.
- **Regional Value:** Utilized local South Australian contractors and suppliers throughout construction, supporting regional economic development.
- **Innovation Leadership:** The project stands as one of Australia's largest hybrid solar-plus-storage installations and a model for future NEM-connected renewable deployments.

Why This Project Matters

The Tailem Bend II Hybrid BESS demonstrates how integrated solar-plus-storage systems can solve real-world grid challenges, reduce curtailment, and deliver reliable, low-carbon energy.

By combining advanced EPC execution, intelligent controls, and open-standard interoperability, Doosan GridTech enabled Vena Energy to deploy one of Australia's most advanced hybrid renewable facilities. The project's success provides a repeatable model for cost-effective, scalable hybrid systems that maximize renewable penetration while maintaining grid reliability.