



RKP

CASE STUDY

CTG JIMUSAER ENERGY STORAGE STATION

World's first GWh-scale vanadium flow battery project

200 MW

POWER

1,000 MWh

CAPACITY

5 h

DURATION

JIMUSAER COUNTY, CHINA

Commissioned: 2025

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Jimusaer, China

A GWh-scale milestone for long-duration storage

The CTG Jimusaer Energy Storage Station is a landmark project representing the world's first vanadium flow battery deployment at gigawatt-hour scale. Located in Jimusaer County in northwestern China, the 200 MW / 1,000 MWh system was delivered by RKP in July 2025 and is currently the largest VFB system supplied by a single battery manufacturer globally.

Operating as a standalone BESS within an integrated PV + Storage demonstration, the system supports 1,000 MW of photovoltaic capacity. It stores surplus daytime solar generation and dispatches energy during peak demand, providing utility-grade, long-duration infrastructure for renewable firming.

WORLD FIRST

GWh-scale VFB deployment

1,000 MW

PV capacity supported

JUL 2025

Project delivery

~25 YEARS

Design life



WHY IT MATTERS

Jimusaer validates vanadium flow batteries as long-life infrastructure for grid-scale renewable integration - not only as backup power, but as a daily operating asset.

Key project information

Core configuration, delivery and lifecycle parameters

Project Name	CTG Jimusaer Energy Storage Station
Location	Jimusaer County, China
Power / Capacity	200 MW / 1,000 MWh (5-hour duration)
Configuration	Indoor installation
Technology	Vanadium Flow Battery (VFB) - RKP Proprietary
Developer	China Three Gorges Co.,
Owner / Operator	Project SPV established by China ThreeGorges Co.,
Technology Provider	RKP
EPC Contractors	CCTEB
Commissioning Date	July 2025
Design Life	~25 years; 20,000+ cycles with 95% capacity retention
Battery Production Period	October 2024 – April 2025

Key functions and benefits

Six services delivered by the long-duration VFB system



Renewable Energy Firming

Absorbs surplus solar generation from the co-located 1,000 MW PV plant and dispatches stored energy during peak demand, reducing renewable curtailment and improving utilization by approximately 9%.



Peak Shaving

Shifts energy from periods of high renewable output to periods of high grid demand, reducing reliance on fossil-fuel peaking plants.



Frequency Regulation

Provides fast-response grid frequency support to maintain system stability.



Power Quality Improvement

Smooths power output fluctuations from variable renewable generation before electricity enters long-distance transmission lines.



Black Start Capability

Provides emergency restart capability for the regional grid.



Emergency Backup Power

Serves as a strategic reserve for grid emergencies.

Environmental and Economic Impact

Annual system-level contribution enabled by the project



1.72 BILLION KWH

Average annual electricity generation supported



519,000 TONNES / YEAR

Standard coal savings



1.424 MILLION TONNES / YEAR

CO₂ emissions reduction



220 MILLION KWH / YEAR

Additional green electricity absorption enabled



LOCAL VALUE CREATION

Supports the renewable energy value chain and industrial development

Multi-revenue operating model

A diversified structure typical of utility-scale storage in China

01

Capacity Rent

Long-term capacity leasing to surrounding PV generators that require firm capacity.

02

Ancillary Services Compensation

Frequency regulation, peaking, reactive power support

03

Renewable Energy Integration Support

Reducing PV curtailment and improving utilization

04

Power Markets

Participation in spot markets and medium-to-long-term electricity trading.



UTILITY-SCALE VANADIUM FLOW BATTERY INFRASTRUCTURE



A reference project for the global energy transition

Scale, duration, resilience and renewable integration validated in one operating asset

Why Jimusaer matters globally

The project's operating role directly mirrors the requirements facing electricity systems worldwide as renewable penetration rises and dispatchable, long-duration flexibility becomes increasingly valuable.

Scale Validation

01

At 200 MW / 1,000 MWh, Jimusaer demonstrates RKP's capability to manufacture and deliver GWh-scale VFB systems. Full-capacity operation was achieved in less than three years.

Renewable Firming

02

The system absorbs surplus renewable generation and dispatches it during high demand - the core role of utility-scale storage in a renewables-led grid.

Long-Duration Performance

03

A 5-hour discharge duration and approximately 25-year design life demonstrate VFB suitability as a long-life infrastructure asset.

Harsh Environment Operation

04

Wide-temperature-range electrolyte and intelligent thermal management support deployment in hot, arid and remote environments, subject to site-specific design.

READY TO BUILD YOUR NEXT LONG-DURATION STORAGE PROJECT?

Let's discuss the right duration, system architecture and commercial pathway for your project.

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SCAN TO CONTACT

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Safe | Durable | Scalable | Built for long-duration value

