RKP

CASE STUDY

CONCH ZONGYANG

ENERGY STORAGE STATION

World's Largest Behind-the-Meter VFB Energy Storage System



INDUSTRIAL ENERGY STORAGE

6 MW	36 MWh	6 h
POWER	CAPACITY	DURATION

ZONGYANG, ANHUI, CHINA

Commissioned: 2022

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Project Overview

The Conch Zongyang Energy Storage Station is the world's largest behind-the-meter (BTM) vanadium flow battery energy storage system. Located at the Conch Cement manufacturing facility in Zongyang, Anhui Province, China, this 6 MW / 36 MWh system was delivered by RKP in December 2022 and has been in continuous commercial operation since then.

The project is also recognized as the world's first BTM VFB energy storage system to adopt a leased electrolyte model. The system operates as an industrial "power bank" for the Conch Cement plant, charging during off-peak electricity price periods and discharging during peak price periods to reduce the facility's energy costs.

A defining feature of this project is its deep localization strategy. Through a joint venture between RKP and Conch, battery module assembly was localized at a manufacturing facility serving the customer. This provides a practical reference for partnership-led localization globally, including battery system assembly, testing, service, and supply-chain capability as project volumes grow.

WORLD FIRST
BTM VFB with leased electrolyte

6 MW / 36 MWh
Power and capacity

6 HOURS
Storage duration

~25 YEARS
Design life

WHY IT MATTERS

Conch Zongyang combines daily industrial energy arbitrage, electrolyte leasing and localized battery assembly, providing a practical reference for industrial customers and manufacturing partnerships.

PROJECT INFORMATION & FUNCTIONS AND BENEFITS

Key project information

Core configuration, delivery and lifecycle parameters

Project Name	Conch Zongyang Energy Storage Station
Location	Zongyang, Anhui Province, China (Conch Cement manufacturing facility)
Power / Capacity	6 MW / 36 MWh (6-hour duration)
Configuration	Outdoor containerized installation
Technology	Vanadium Flow Battery (VFB) - RKP Proprietary
Developer	Conch Cement
Owner/ Operator	Project SPV established by Conch
Technology Provider	RKP
EPC Contractor	Anhui Conch Design & Research Institute of Building Materials Co., Ltd.
Commissioning Date	December 2022
Design Life	~25 years

Key Functions and Benefits

Energy Cost Optimization

Charges during off-peak electricity price periods and discharges during peak price periods, reducing the facility's overall energy procurement costs through peak-to-valley price arbitrage.

Frequent Cycling

Designed for daily charge-discharge cycling to maximize arbitrage revenue, demonstrating VFB technology's suitability for high-frequency cycling without capacity degradation.

Peak Shaving

Provides peak power load for the cement production line, effectively alleviating peak power supply pressure on the grid.

Advanced Decarbonization

Supports the cement manufacturing facility's net-zero transition by enabling greater utilization of off-peak renewable energy and reducing reliance on fossil-fuel-derived grid electricity.

Backup Power

Provides emergency backup power capability for critical manufacturing processes during grid disturbances.

Efficient Land Use

Outdoor containerized design enables efficient utilization of limited industrial land space within the manufacturing facility.

Localization of Battery Manufacturing — A Proven JV Model

The Conch project represents a milestone in RKP's localization strategy. Through a joint venture between RKP and Conch, battery module assembly was localized at a manufacturing facility in Wuhu, China. This JV-based localization model delivers several key benefits:

Stable Early Operations

Meeting Conch's internal demand ensures reliable plant operations in the initial stage of the JV.

Increased Value Addition

Transitioning Conch from end-user to supplier allows the partner to capture more value addition across the supply chain.

Local Economic Impact

Localized battery module production supports job creation and contributes to sustainable growth of the local community.

Revenue Model

The project generates revenue primarily through energy arbitrage:

01 Electricity Price Arbitrage

The primary revenue stream, generated by charging during off-peak (valley) electricity price periods and discharging during peak price periods, achieving an IRR exceeding 10%.

02 Reduced Demand Charges

Peak load reduction lowers the facility's maximum demand charges from the utility.

03 Electrolyte Leasing

The leased electrolyte model reduces upfront capital expenditure, improving project IRR and bankability.



6 MW / 36 MWh | INDUSTRIAL BEHIND-THE-METER VFB ENERGY STORAGE



An industrial reference for long-duration storage

Localized battery assembly plant established by Conch & RKP

Why this project matters globally

The Conch Zongyang project is strategically relevant to industrial, behind-the-meter, and distributed energy applications for the following reasons:

Frequent Cycling Proven 01

The Conch project operates on a daily charge-discharge cycling regime to maximize arbitrage revenue. This demonstrates VFB technology's ability to withstand frequent, deep cycling without material capacity degradation — relevant to merchant, contracted, industrial time-of-use, and renewable-firming applications that require regular cycling.

Localized Battery Assembly 02

The Conch–RKP joint venture demonstrates a proven localization model where battery module assembly is established through a JV structure. This provides a practical reference for local battery assembly in local markets. The JV approach can support job creation, skills transfer, local procurement, and supply-chain development where project volumes justify investment.

Electrolyte Leasing in BTM Context 03

As the world's first BTM VFB project to use leased electrolyte, Conch demonstrates that the electrolyte leasing model is applicable not only to grid-scale projects but also to industrial behind-the-meter applications — broadening commercial structuring options for customers.

Commercial Operating Reference 04

The project-reported IRR exceeding 10%, achieved primarily through electricity price arbitrage under local market conditions, demonstrates a commercial operating precedent.

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