

THE APPLICATION
OF TECHNOLOGY



**Kehui Battery Energy
Storage System**

Kehui International

Kehui International,
Ware, UK



The word Kehui, literally means the Application of Technology in the Chinese language. This phrase perfectly defines the company's commitment to technological innovation, which it achieves whilst striving for the highest levels of quality.

The company was founded in 1992 utilising the best of Asian, European expertise to develop a range of cable and transmission line fault locators, as well as equipment for the automation of electrical distribution systems and its range of switched reluctance motors.

The range of battery energy storage systems is the latest addition to its product range.

Kehui factory,
Zibo, China



Kehui Battery Energy Storage System

Introduction

Battery Energy Storage Systems (BESS) play a key role in modern power system operation, supporting renewable integration, improving power reliability, and optimising electricity prices.

The energy management system (EMS) enables optimal charge-discharge control, peak-shaving, and electricity-price arbitrage. The unique Synchronised Fixed Frequency (SFF) technology supports fast, stable grid-connection and islanding.



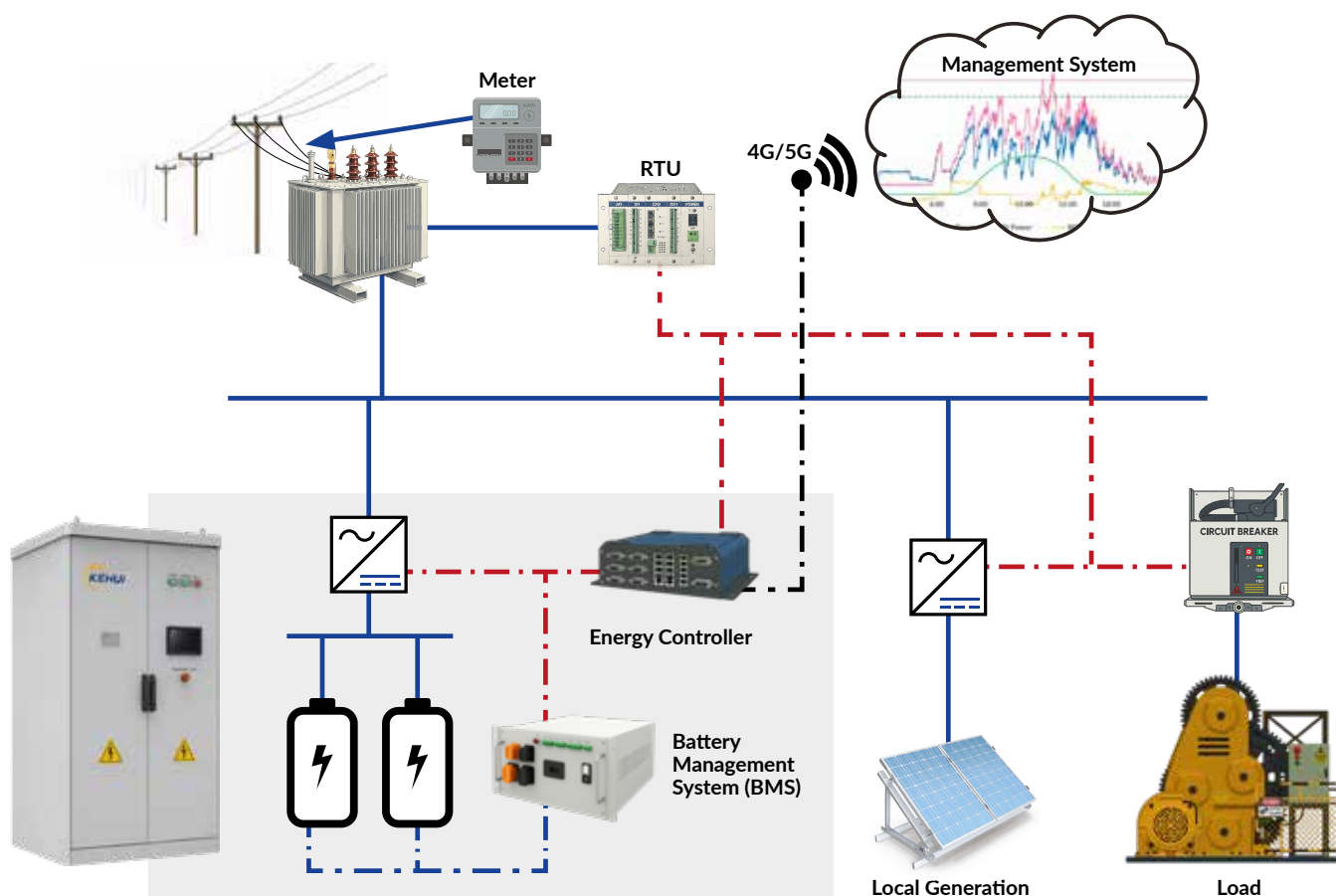
Benefits of Kehui BESS

- EMS providing charge and discharge control for renewable integration and economic operation.
- High-performance market price prediction and arbitrage control, facilitating a good return on investment.
- Provides an uninterruptible (backup) power supply in the event of a grid outage.
- Unique SFF Technology for reliable islanded operation and fast, stable switching between grid-connected and islanded modes (40–100 ms).
- Integrated solution, providing BESS, communication, and protection systems.
- Communications to the SCADA/EMS system via the 4G/5G mobile network with flexible communication protocols.
- Mobile system to supply remote sites with no grid connection.

System Description

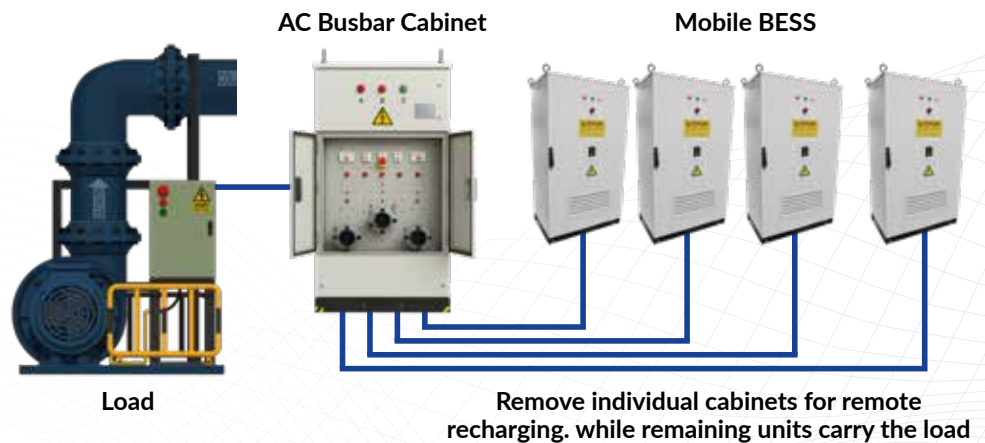
The diagram shows the system configured for a 'behind the meter' network fed from the grid with supplementary solar power.

The cabinet contains the battery stack, inverter, battery management system and the energy controller. The local energy controller (SEC-200) uses advanced algorithms to control the battery charging and discharging, ensuring optimal economic usage. The KEM-200 operates as a cloud-based platform for real-time system monitoring and status tracking.



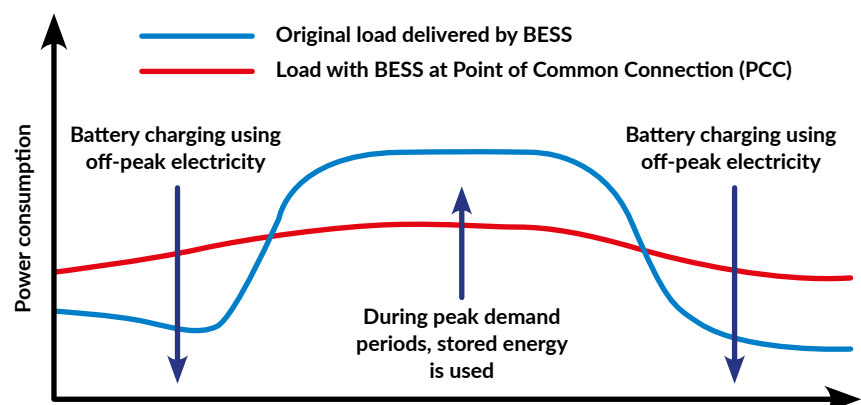
Mobile System

When power is required at a site without access to a grid connection, a mobile system can be used. This consists of an AC busbar cabinet, which is connected to the load, and up to four mobile battery cabinets. These are connected to the busbar and can be selectively removed for remote charging at a suitable location, leaving the load supplied by the remaining units, with switching supported by SFF technology.



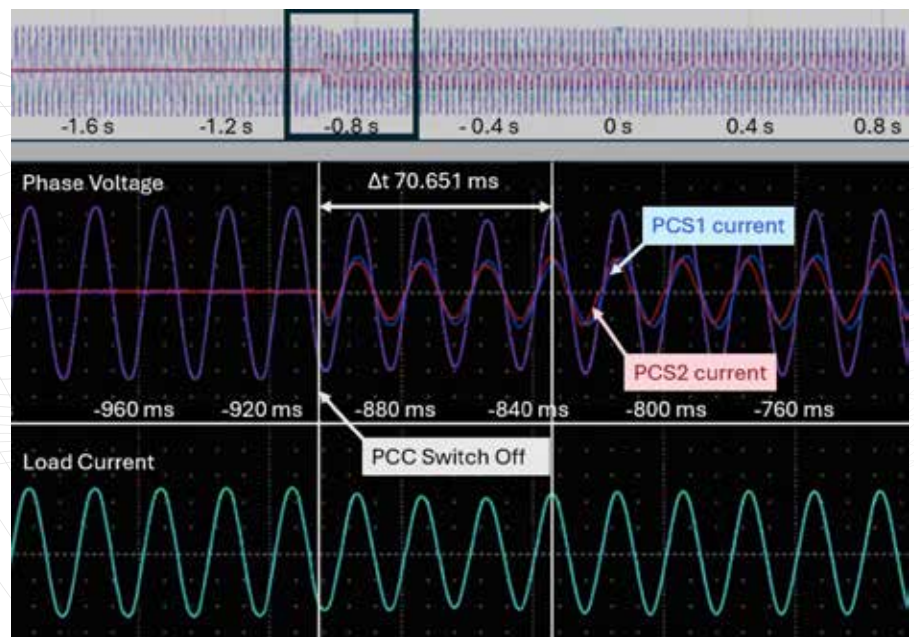
Return on Investment

The BESS, managed by the energy management system, uses advanced AI-enhanced algorithms to integrate live pricing, battery usage and demand forecasting. The system optimises coordination between battery systems, the grid and local generation. As a result, the system maximises efficiency such that it can make a return on investment in typically 3-5 years. When used together with renewable energy sources, if the resale of electricity to the grid is permitted, the additional revenue significantly enhances the overall system value.



SFF Technology

During islanded operation, KEHUI BESS ensures stable voltage and frequency control with its unique, advanced SFF technology. By coordinating power electronic converters using a synchronised current-source control approach, the SFF enables the system to deliver stable, seamless transitions between grid-connected and islanded operation within 40–100 ms. It also ensures reliable operation and stable voltage under frequent and pronounced variations of generation and load in the system. This is illustrated in the example below, where the point of common connection (PCC) opens, disconnecting the islanded system from the grid. Stable operation is achieved after 70.651 ms.



Specification



Each cabinet is equipped with the following:

- Battery packs
- Battery management system (BMS)
- Power conversion system (PCS)
- Local energy management controller
- Fire protection system
- Energy management system, with optional cloud operation, providing optimised charging and discharging

BESS Technical data

Item	Specification
Battery Capacity	Air-cooled 61–241 kWh
	Liquid-cooled 261–6,709 kWh
Cell Type	Lithium Iron Phosphate (LiFePO ₄)
Cell Specification	3.2 V, 280 Ah
Charge/Discharge Rate	≤ 0.5 C (Charge/Discharge in 2 hours)
Pack Configuration	1P16S
Pack Voltage	Rated: 51.2 V; Range: 42.4–58.4 V
DC Bus Voltage	Rated 768 V (636–876 V)
Cycle Life	8000 cycles (70% rated capacity)
BMS Communication	RS485, Modbus RTU, Modbus TCP
AC/DC Parameters	
Rated Power	105 kW
Max AC Power	115 kW
AC Voltage	380 V (340–460 V)
Power Factor Range	-1 to 1
AC Connection	3L + N + PE
Isolation	Non-isolated
System Parameters	
Max Efficiency	88%
Communication Interfaces	RS485, Ethernet, WiFi, 4G
Protocols	Modbus TCP, IEC 104, IEC 61850
Corrosion Protection	C3 (Optional C4/C5)
IP Rating	IP55
Cooling	Air cooling, Liquid cooling
Operating Temperature	-25 to 55 °C
Humidity	5–95% RH, non-condensing
Max Altitude	4000 m (derating above 3000 m)
Fire Protection	Pack + cabinet; FM-200 / Novec 1230 / aerosol



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