Company Profile 2022

Stock code: 002518

Shenzhen Kstar Science and Technology Co., Ltd.

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Customer Focused Quality Oriented

01 About us

科士达概览

Two R&D Centers

Shenzhen Guangming and Fujian Fuzhou

Six Manufacturing Bases

Shenzhen Guangming、Shenzhen Guanlan、Guangdong Huizhou、Jiangxi Yichun、Fujian Ningde、Vietnam Haiphong

Company Campuses

KSTAR was established in 1993 and listed on Shenzhen Stock Exchange in 2010. It has a **National Enterprise Technology Center** and is recognized as a **National Demonstration Enterprise for Technology Innovation** and a **National Hi-Tech Enterprise**. It is the leading provider of comprehensive solutions on the development and manufacturing of data center products, PV and new energy products, EV charging solutions and energy storage systems.

Headquarters
Nanshan, Shenzhen

R&D and Manufacturing center
Guangming, Shenzhen

Manufacturing center
Zhongkai, Huizhou

Manufacturing center
Guanlan, Shenzhen

CATL-KSTAR joint venture
Ningde, Fujian

Manufacturing center
Haiphong, Vietnam

Manufacturing center
Yichun,,Jiangxi

CATL-KSTAR

Company Name

CATL&KSTAR Science and Technology Co., LTD

Date of Establishment

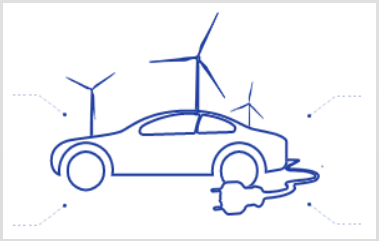
2019

Production and office base

Fujian Province

Main Business

R & D, production and sales of PCS, special energy storage PACK, charging pile and integrated products of "optical storage and charging"



Main Products：

PV inverter　EV charger　PCS

ESS Solution

BTM　T&D　Generation

KSTAR Overview

150+

Countries and Regions

4000+

Employees

480+

R&D Personnel

475

Patented Technologies

Milestones

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1993
KSTAR founded; entered the UPS market

2000
Industrial park in Guanlan, Shenzhen completed and put into operations

2009
Industrial park in Zhongkai, Huizhou completed and started operations; Entered the new energy area

2010
Listed on SZSE
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2013
Industrial park in Guangming, Shenzhen completed and put into operations; Entered the electric vehicles market

2015
National Enterprise Technology Center

2016
National Demonstration Enterprise for Technology Innovation

2018
Passed CNAS laboratory certification

2019
Partnered with CATL to establish a joint venture

2020
Commenced construction of KSTAR (Vietnam)

2021
Jiangxi Changxin Golden Sunshine Power Co., Ltd. completed and put into operations

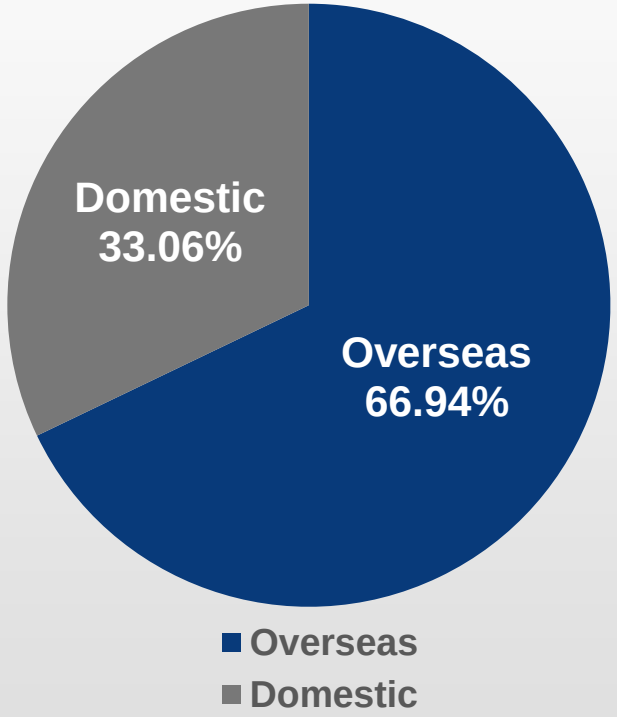
Business Performance in 2021

Total Revenue in 2021

RMB 3.04 billion

- KSTAR's revenue from data center accounted for 82.40%, a year-on-year increase of 15.83%, maintaining a momentum of steady growth.
- Energy storage and new energy photovoltaic industry achieved rapid growth in revenue.

Percentage of Domestic and Overseas Revenue

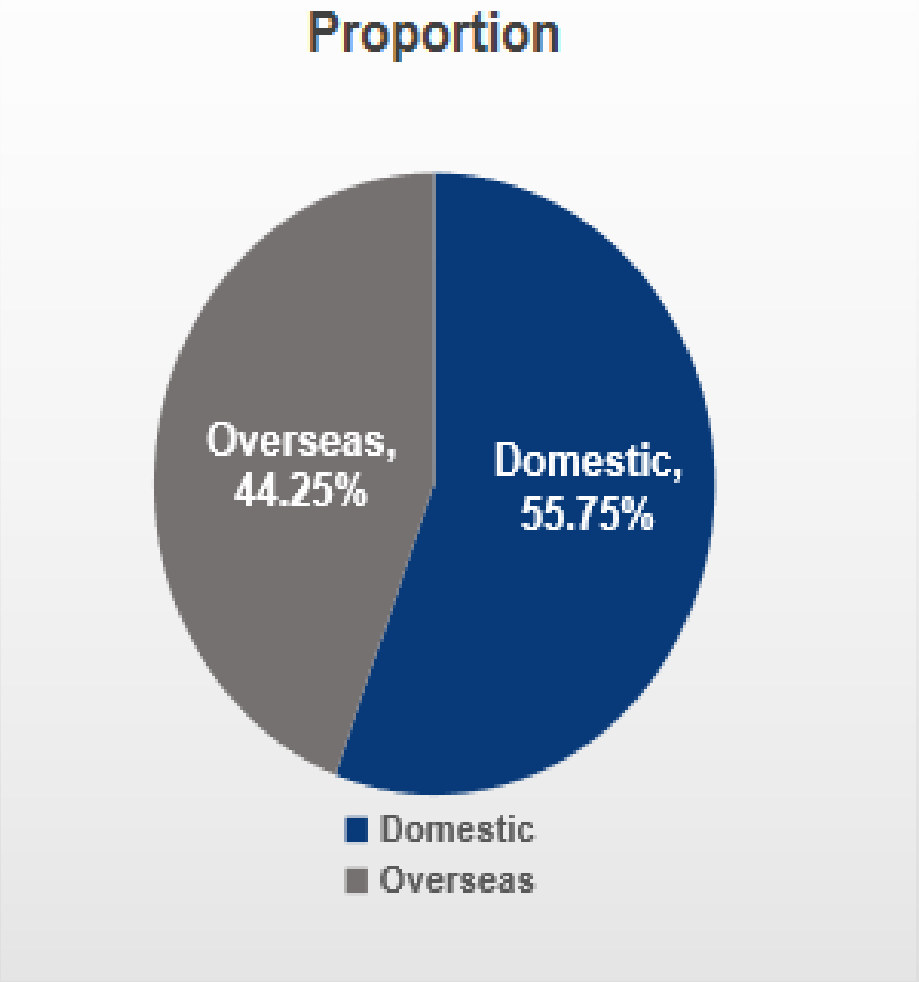


Business Performance in 2022

Total Revenue of 2022

RMB 4.4 billion

The revenue of pv inverters and energy storage products increased by 465.06% year-on-year.



KSTAR, Always With You

- 900+ Technical Service Personnel
- 43 Technical Service Centers
- 214 Technical Service Stations
- 7×24h Response

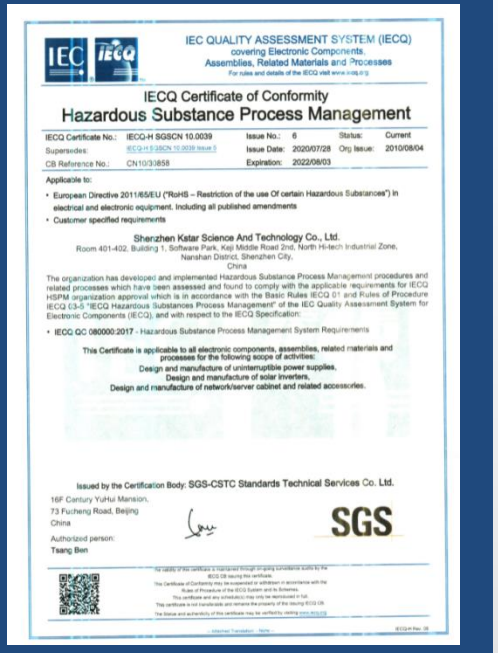
With a business network covering over 150 countries, KSTAR adheres to the principle of "customer-oriented" and brings high-quality services across the globe, creating greater value for customers.

Certifications

ISO9001
Quality Management System Certification

ISO14001
Environmental Management System Certification

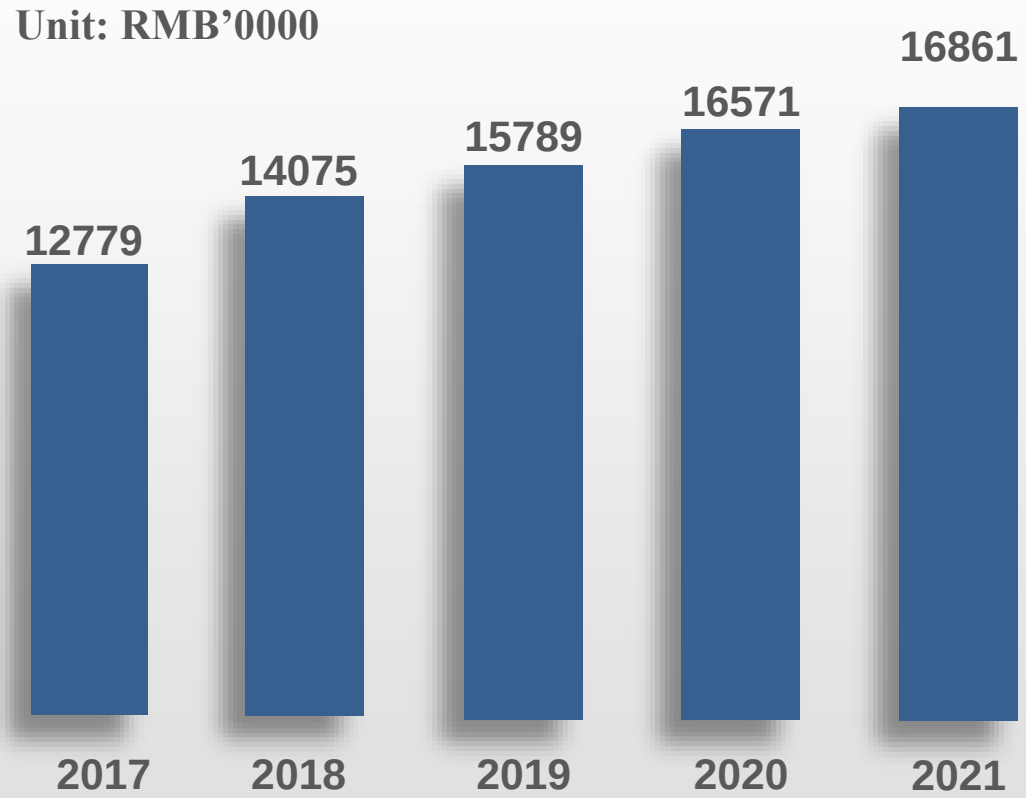
ISO45001
Occupational Health and Safety Management System Certification



IECQ QC080000
Hazardous Substance Process Management System Certification

Continuous Increase in R&D Spending

R&D Spending



Nearly **RMB800 million** has been spent on R&D (2017-2021)

In 2021, R&D spending accounted for **6.01%** of the revenue

KSTAR persists in independent innovation and continues to increase R&D spending. At the end of 2021, the company had obtained **475** international and domestic patents, with more patents pending approval, and participated in the formulation of **85** national and industrial technical standards.

CNAS-Accredited Laboratory

CNAS-Accredited Laboratory

EMS Test

EMI Test

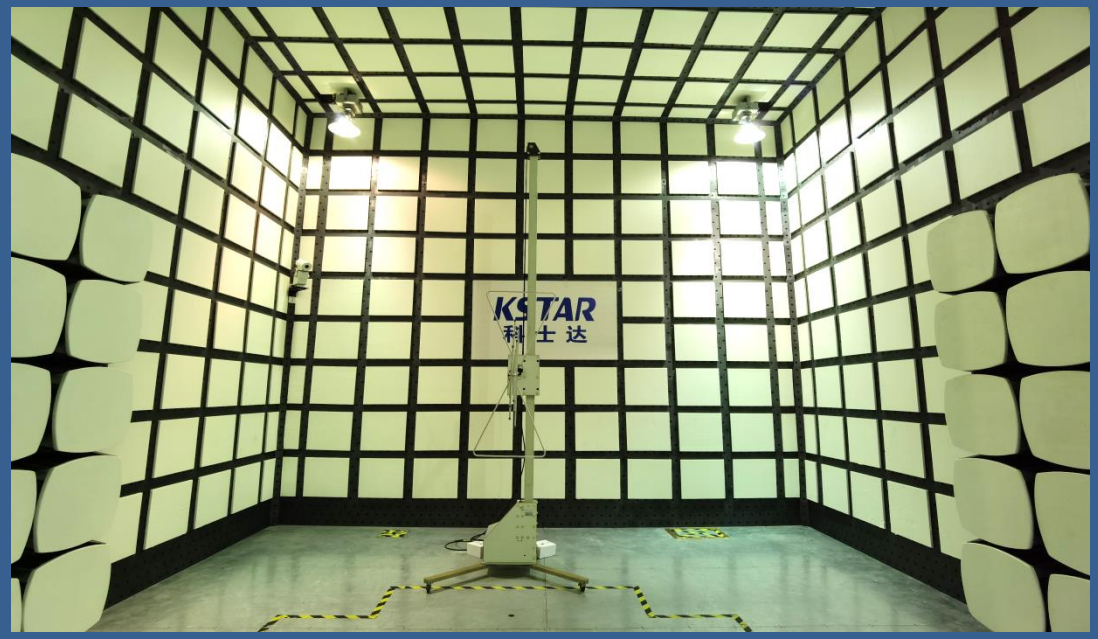
Enthalpy Difference Laboratory

Waterproof Laboratory

Vibration Laboratory

Salt Spray Laboratory

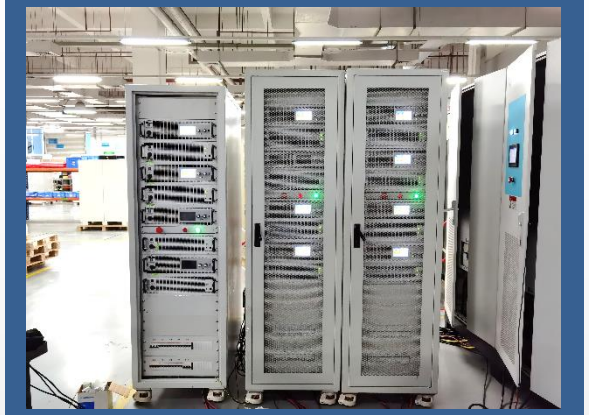
Sand and Dust Laboratory



3m Anechoic Chamber

R&D Equipment

AC Input Power



DC Input Power

Failure Analysis Equipment

Precision Cutting Machine

Test Load (5MW)

5000㎡ R&D Testing Platform

Precision Visualizer

Precision Grinder

Production Capability

AI/SMT Workshop

SMT Production Line

AOI (Automated Optical Inspection)

Fully Automated Conformal Coating Systems

UPS Workshop

UPS Assembly

ATE (Automatic Test Equipment)

Aging Test

Precision Air Conditioner Workshop

Precision A/C Assembly

Precision A/C Leak Detection

Precision A/C Test

Production Capability

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EV Charging Piles Workshop

Charging Piles Assembly

ATE (Automatic Test Equipment)

Module Aging Feedback System

PV Inverter Workshop

PV Inverter Assembly

ATE (Automatic Test Equipment)

Inverter Aging Feedback System

Storage Battery Workshop

Full Auto Cast-Weld Production Line

Electrode Plate Plant

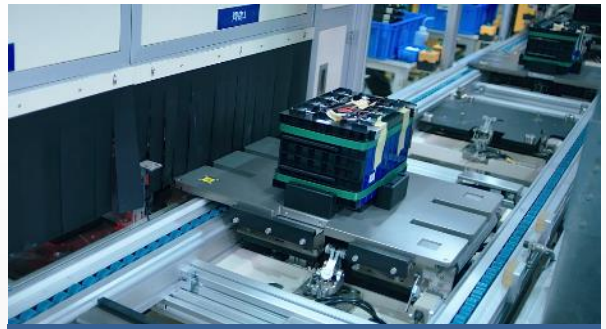
Online Battery Monitoring

Production Capability

KSTAR boasts advanced ESS intelligent manufacturing technology.

Automatic Feeding

Module Stacking



Laser Welding

Battery Assembly

Performance Testing

Aging Test

Factory Test and Packaging

Relying on strong scientific research and technical strength, CATL-KSTAR introduces intelligent robots in the production process to realize the full-process automatic production of six-joint feeding robot automatic feeding, four-axis servo SCARA robot and linear robot module stacking, full-automatic welding, laser welding, AOI automatic optical detection and DCR testing, becoming a leading highly-automated intelligent manufacturing factory.

BMS PCBA Production Line

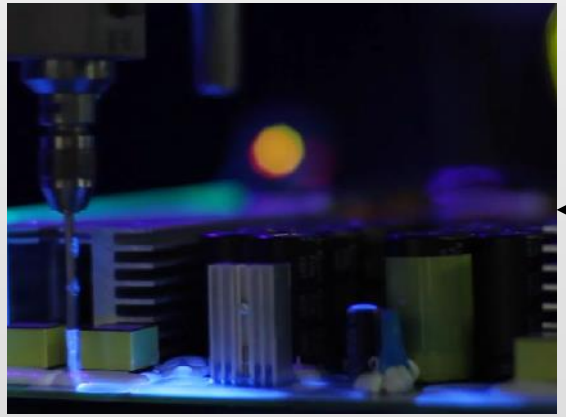
SMT Production Line

AOI (Automated Optical Inspection)

AI

AOI (Automated Optical Inspection)

PCBA ATE



Full-automatic Three-Proofing Coating

PCBA Stock

02 Product Introduction

Four Main Businesses

Data Center

PV Inverter

Energy Storage

EV Charging Piles

All-Round Solutions for Smart PV Power Stations

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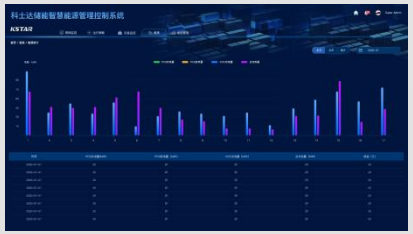
Residential String Inverter


Commercial String Inverter

Centralized Inverter

Inverter-Booster



PV Power Station Monitoring System

Better LCOE

PLC power carrier communications, saving costs of communication cables and construction;

Supported connection to aluminum alloy cables, saving on the initial cost of AC cables;

Supported 210 (battery piece) components, max. 1.8 ultra high ratio of total power to rated capacity.

Intelligent & Efficient

Internally integrated PID repair function to guarantee 25-years of highly efficient power generation in the power station;

Intelligent IV scan and remote quick locating of faulty sites to achieve highly efficient operations and maintenance;

Supports night SVG function and power network dispatch to ensure stable operation of power stations.

Safe & Reliable

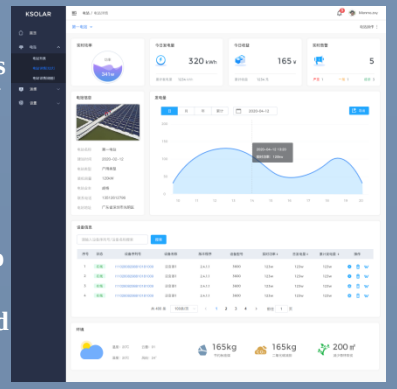
Fire safety design, DC arc testing, fault recording and playing;

IP66+C5 protection level, adaptable to tough operating environments, substantially longer equipment service life;

stable operations without disconnection in low SCR.

Operations based on Intelligent Monitoring

- Real-time monitoring: Comprehensive power station data, including the parameters of inverters, combiner boxes, batteries, environmental monitors and other equipment;
- Smart diagnosis: Analyzing the IV curves of PV components to identify potential hazards and raise efficiency through IV diagnosis and smart analysis;
- Highly efficient operations and maintenance: Sending fault alarm instantly and providing solutions to cut the costs of operations and maintenance;
- Remote control: Remote control and firmware upgrading to support operations and maintenance;
- Open platform: Offering access to third party platforms and fast connection to monitoring systems;



String Inverter

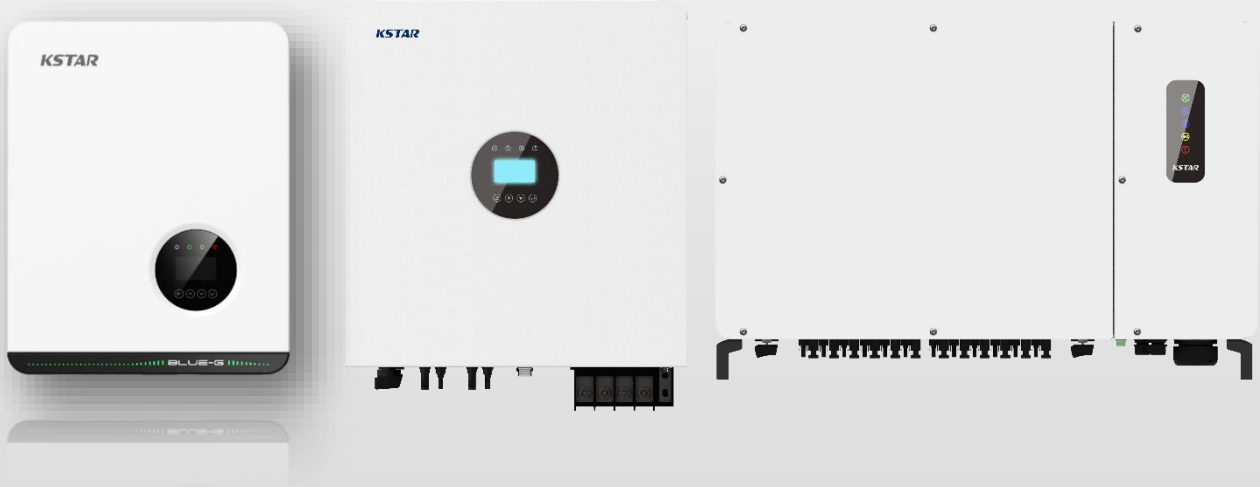
KSTAR’s string inverters are applicable to user requirements of various power ranges.

Residential String Inverter

- BluE-G single-phase 1-3kW
- BluE-G single-phase 3-8kW
- BluE-G three-phase 3-25kW

Commercial String Inverter

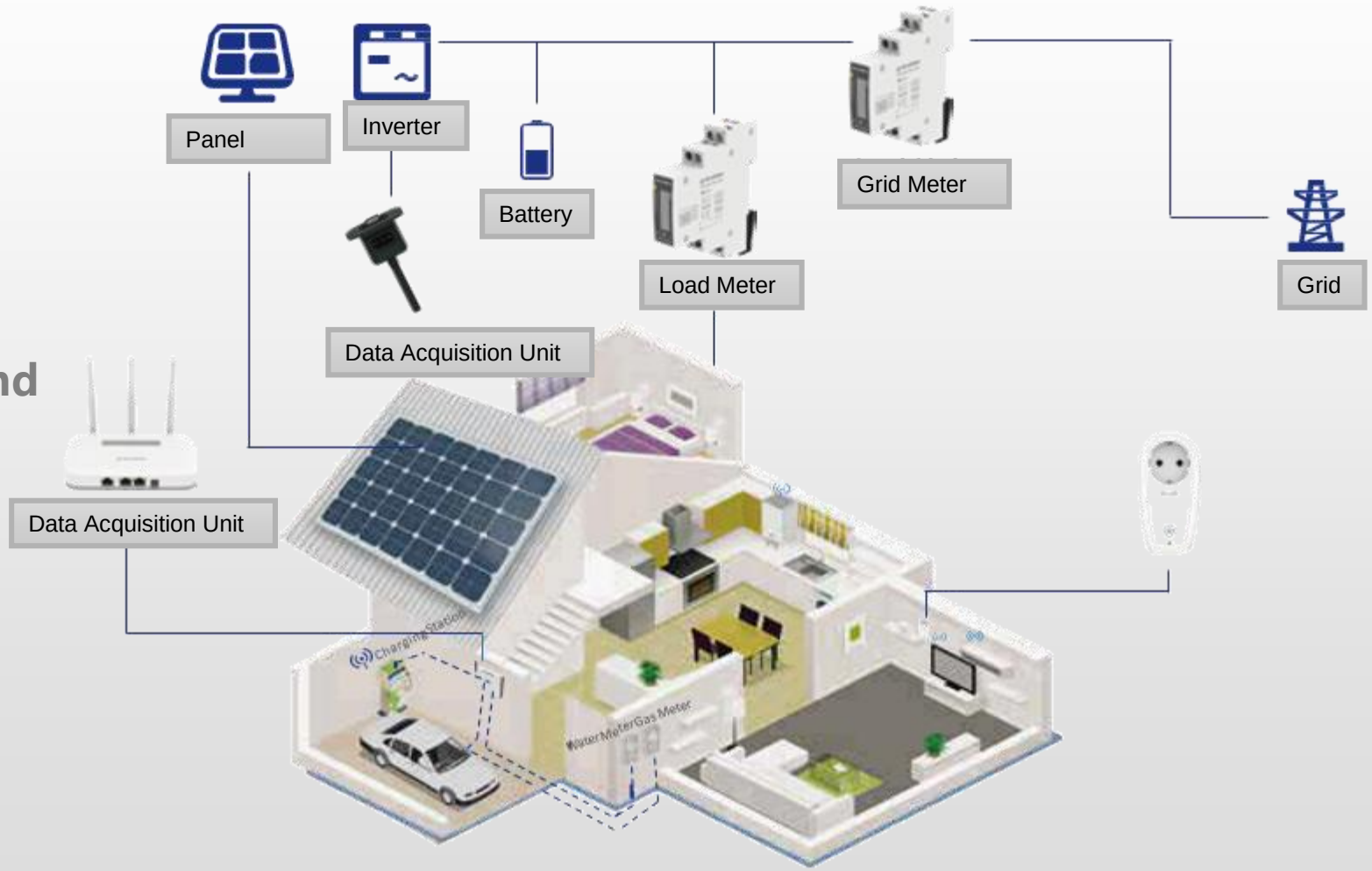
- KSG three-phase 30-40kW
- KSG three-phase 50-80kW
- KSG three-phase 120-250kW



Storage Monitoring Platform

SOLARMAN

- Unified Optical Storage Monitoring Platform
- Intelligent Coordination between Power Generation and Energy Storage
- Real-time monitoring energy flow
- Remote control system
- All-in-one ESS automatically provides backup power



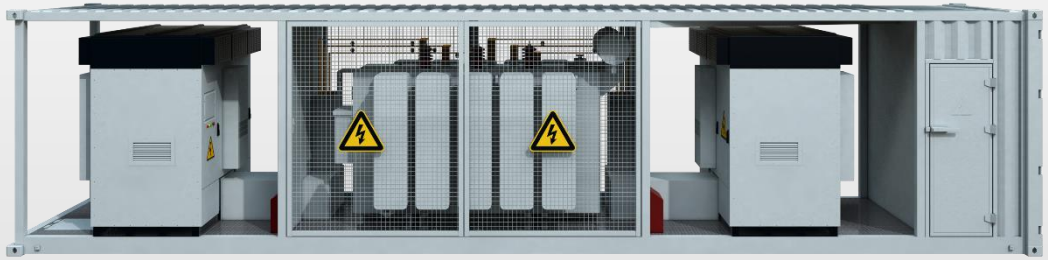
Centralized Inverter

Centralized Inverter

- 1500Vdc Outdoor Solution GSM3125D
- 1500Vdc Container Solution GSM3125C

All-in-one turnkey Solution

- GSM6250D-MV
- GSM6250C-MV



Key PV Projects

Residential PV Power Station Projects

Residential PV Project in Dongyang, Zhejiang

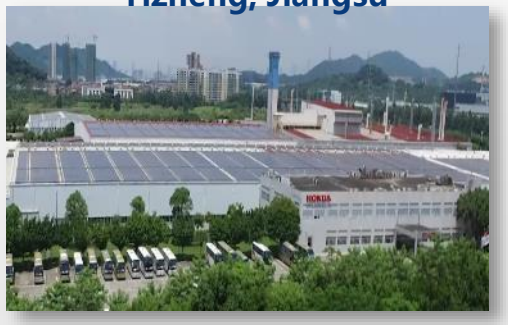
Residential PV Project in Yizheng, Jiangsu

Residential PV Project in Brazil

Residential PV Project in Zhuolu County, Hebei

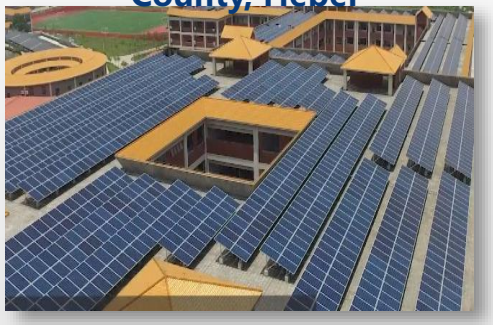
Distributed PV Power Station Projects

SPIC’s Roof PV Power Station in Shouguang Logistics Park,



Roof PV Power Station in Honda Industrial Park

SPIC’s Distributed PV Power Station in



Guangzhou Pearl-River Vocational College of

Large Power Stations (parity and bidding projects)

500MW Ground Power Station in Ukraine

Bayannur 50MW PV power station

SPIC’s 500MW Grid Parity Project in Heilongjiang

Zhejiang Taihan 550MW Solar Fishery Station

End-End Solutions for Smart Energy Storage

Residential All-In-One Storage Solution

Power Station-Grade Energy Storage Inverter

Integrated Containerized Energy Storage System

Integrated Solution of Energy Storage and Medium Voltage

EMS Cloud Platform System

Comprehensive Solutions

The solutions provided include residential all-in-one storage solutions, AGC frequency modulation, power grid energy storage, new energy storage, multi-energy complementary storage, industrial and commercial distributed solutions, micro-power grid energy storage, integrated solution of medium voltage and power battery echelon application.

Intelligent & Efficient

Dispatchable active and reactive power; PQ, VF, VSG, SVG and black-start functions; optimized system design and temperature control technology, low system power consumption and high conversion of electric energy.

Safe & Reliable

Improved charging and discharging solutions to increase the service life of batteries; high and low voltage ride through; advanced active anti-islanding protection and AC/DC double auxiliary redundant power design.

Application:

Household energy storage

Industrial and commercial energy storage

Guangzhou X network technology energy storage 5WMH project

New energy power station energy storage

Yecheng 10MWH/20MWH new energy side energy storage

Three-phase Residential All-in-one ESS

Three-phase All-in-one Residential ESS 10kW/20kWh

- Three-phase all-in-one residential ESS， which is expandable to 10kW/40KWh
- Applicable to three-phase household，like Germany, Italy etc.
- Safe and reliable, 48V low voltage
- CATL 4.3U high-performance LFP cell, Compatible battery pack
- Support three-phase 100% imbalance，single-phase and three-phase load accessible
- Support on-gird and off-grid transform; support DI/DO to control diesel engine
- Cloud platform monitoring， Remote Up-grade
- VPP accessible

All-in-one ESS References

Solution:
BluE-S 5000D + BluE-Pack 10.2kWh

PV System:
6.6kw - 330W Seraphim Half-Cell

Location: Netherlands

Self-consumption:
- In daytime, the solar system will power the load and charge the batteries.
- At night, the battery will power the load through hybrid inverter..

Off-grid Mode:
- During blackout, solar panels and batteries will power the load.

C&I All-in-one Energy Storage Solution

C&I All-in-one ESS Cabinet

- Highly-integrated solution
  Modular-design，2~4h backup
- PV+Energy Storage，Self-consumption
- IP65，Easy to transport and install

- Emergency Power Supply
  On-grid and off-grid Mode，
  PV+Energy Storage+Diesel engine
- Demand management model(TOU)
- Remote Monitoring、Integrated EMS

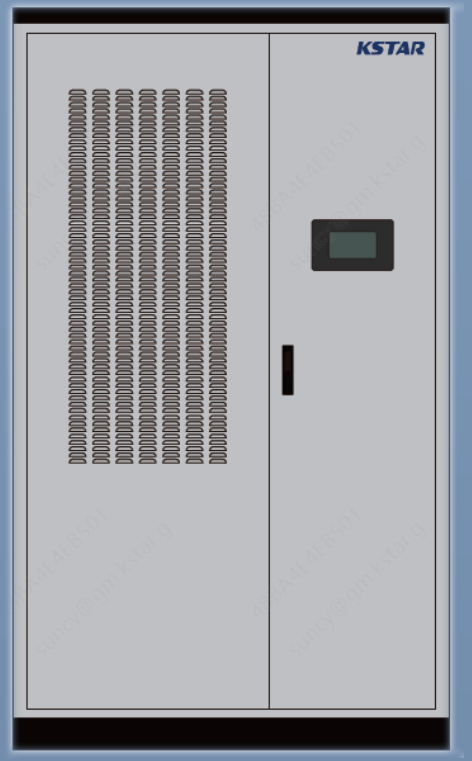
50kW/100kWh (Expandable)

C&I All-in-one Energy Storage Solution

50kW IP65 Modular PCS

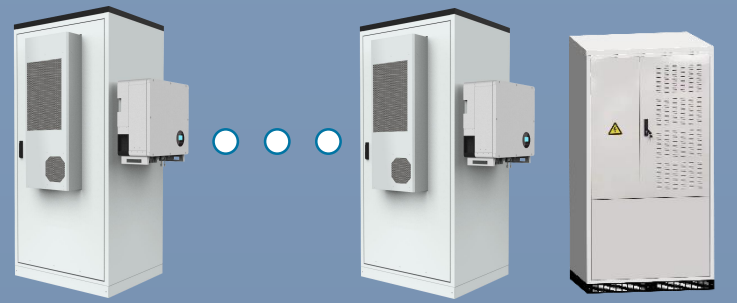
- PV Input(Optimal)
- Battery Input
- Communication;
- AC Output

250kW IP65 PCS Cabinet



- 250kW PCS Cabinet, IP65
- Integrated Solution, PCS+EMS+TR+PDU

Application 1: Wall-mounted



- On-grid，maximum 20 parallel，50kW~1MW
- Off-grid，maximum 10 parallel，50kW~500kW

Application 2: Modular

- 250kW/500kWh，
- Integrated Solution
- Expandable

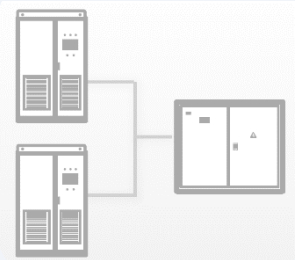
Power Station Energy storage converter

GSE Series
1250/1575/1725

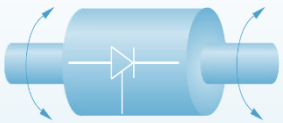
GSE-D Series
1375/1575/1725

- New energy power station supporting energy storage
- Power grid peak and frequency regulation, auxiliary power market services
- Improve power quality and relieve congestion of transmission equipment
- Thermal Power Station black-start

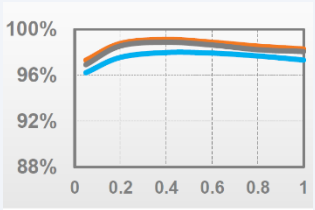
Quick response



parallel

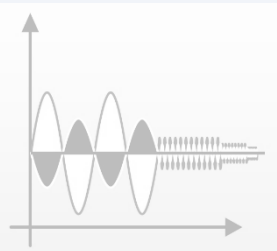


VSG



99% Efficiency

Active/reactive power output



HVRT/LVRT/FRT

All-in-one Energy Storage Converter

GSE-DMV Series
2750/3150/3450

GSE-MV Series
2500/3150/3450

Integrated converter; low cost

20ft Container; Convenient transportation

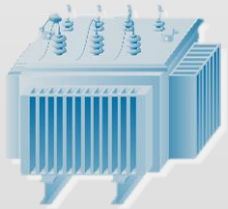
Long-term operation at 110% of full load

H/LVRT

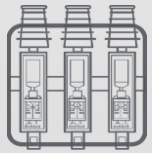
Standard communication interface

PQ,VSG, VF operating modes and black-start

Converter

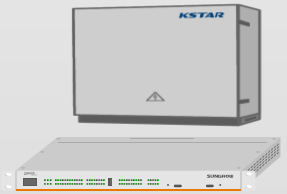


Step-up ransformer



Medium Voltage Switch

Low Voltage PDB



Local Controller

Container

Energy Management System- KEMS

Operational data acquisition and monitoring

Collect and process the analog quantity and status quantity sent by PCS, BMS, transformer protection measurement and control and other protection measurement and control equipment in real time, and display the real-time value, historical statistics, trend, alarm event, etc.

Smooth load

Real-time monitoring of power generation power, grid output power, user power consumption through the control of energy storage battery charging and discharging achieving the management of equipment.

Power distribution control

In the on-grid mode, the system receives dispatching commands and distributes power adjustment commands to each distributed power module according to the current SOC, SOH, charging and discharging state and alarm state of the energy storage.

Energy storage SOC independent maintenance control

Real-time monitoring of energy storage SOC and current charging and discharging power to keep energy storage battery SOC within a reasonable range

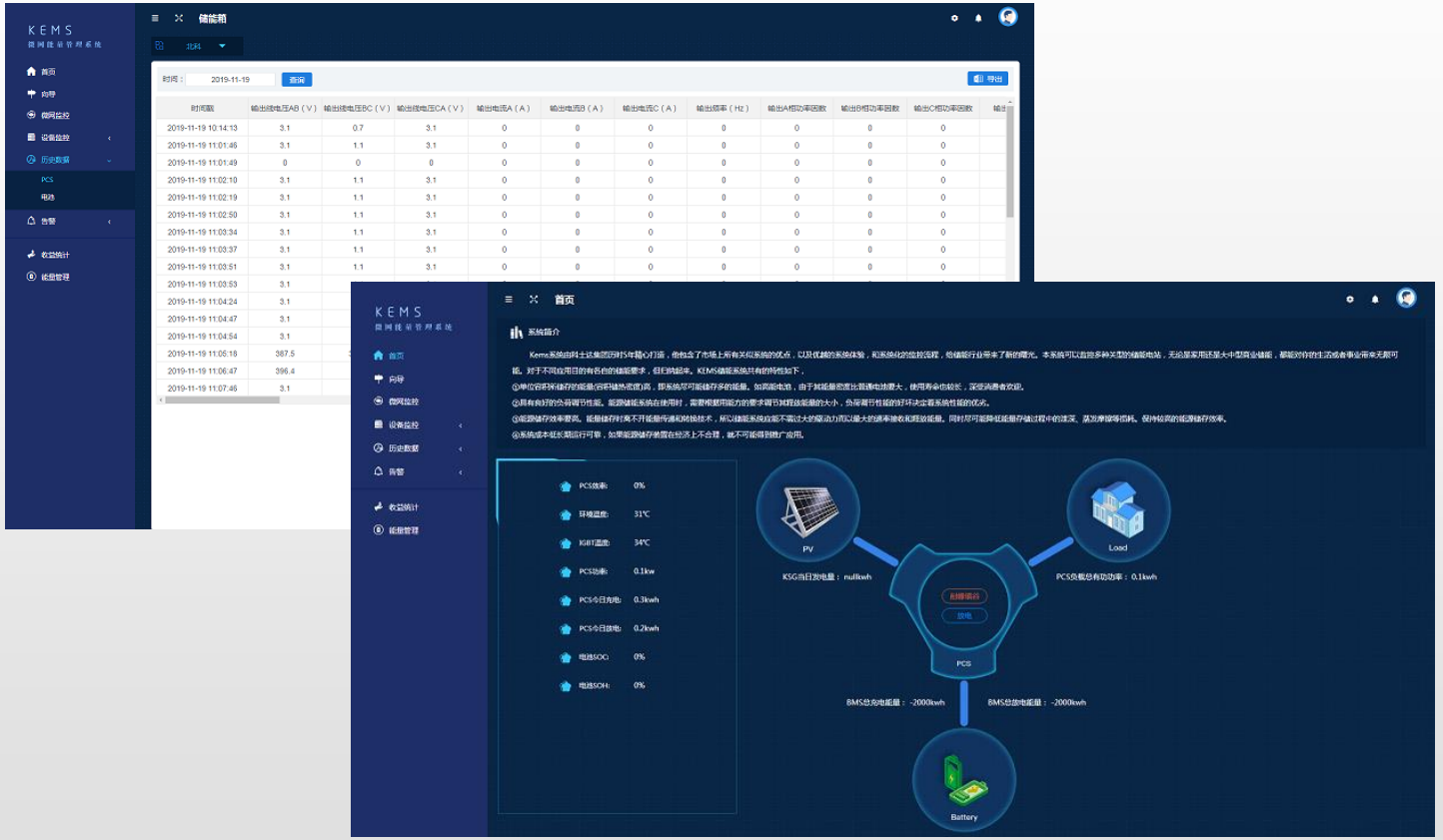
TOU

Different charging and discharging strategies are implemented to realize peak-shaving price difference.

Data report

A data report is generated based on the selected time, and historical data can be viewed and exported.

Energy Management System- KEMS



Display Screen

Host Computer Software

KSTAR Works Hand in Hand with You

客户为本 匠心为质
Customer Focused Quality Oriented

Data Center

New Energy & PV

EV Charging Piles

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