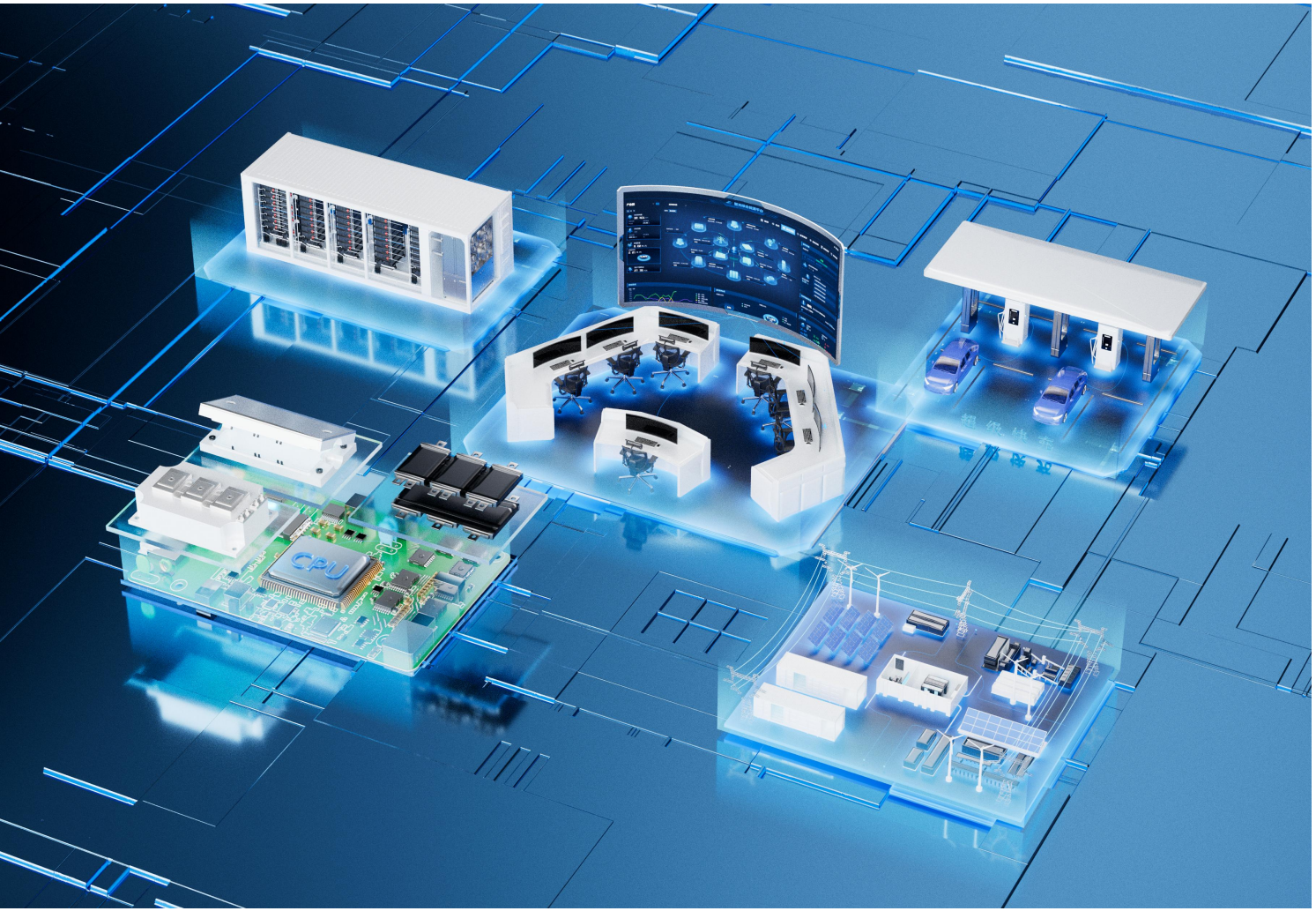
Energy Expert to Global ESS Users

DEDICATION TO SMART ENERGY



CONTENT

01

DUAL CARBON TARGET AND ENERGY STORAGE POLICY

1.1 National Energy Strategy

Energy System Reform

- The 19th National Congress of the CPC called for advancing the revolution in energy production and consumption, and building a clean, low-carbon, safe, and efficient energy system, providing clear direction for China's energy transition.

Carbon Neutrality Goals

- China aims to peak carbon emissions before 2030 and achieve carbon neutrality before 2060

Energy Transition

- Electrification of end-use energy consumption
- Renewable energy-based power generation

1.2 New Power System

	Acceleration (Present–2030)	Formation (2030–2045)	Maturation (2045–2060)
Power Supply	• Renewables Lead Generation Growth • Coal Power Remains the Backbone of Energy Security	• Renewables Become Main Capacity Source • Coal Power Accelerates Decarbonization	• Renewables Dominate Power Generation • Electricity–Hydrogen Integration
Power Grid	• Expansion of Large-Scale Power Grids • Rise of Distributed Smart Grids	• Smarter, More Flexible & Digital Grids • Convergence of Large-Scale and Distributed Grids	• Breakthroughs in Advanced Transmission Technologies • Integrated Power & Energy Transport Systems
Users	• New Consumption Models • End-Use Electrification • Flexibility & Demand Response	• Low-Carbon, Flexible & Smart Energy Use • Widespread Electrification Across Sectors	• Reshaping Power Production & Consumption • Flexible User–Grid Interaction
Energy Storage	• Scaled Energy Storage Deployment • Intra-Day Balancing Support	• Long-Duration Storage Breakthroughs • Multi-Day Balancing Support	• Multi-Timescale Energy Storage Coordination • Greatly Enhanced Energy System Flexibility

1.3 Energy Storage Policy Transition

2012-2016

Exploration

- Energy Storage Recognized as a Key Innovation & Demonstration Area

2012 – China's Energy Policy (White Paper); 2014 – Energy Development Strategy Action Plan; 2016 – Energy Technology Revolution & Innovation Action Plan

2017-2019

Strategy Formation

- First Strategic Framework for Energy Storage Development

2017 – Guiding Opinions on Energy Storage Development; 2019 – Energy Storage Development Action Plan (2019–2020)

2020-2023

System Building

- Policy Shift Toward Standards, Pricing Mechanisms & High-Quality Manufacturing, Enabling Large-Scale Deployment

2020 – Energy Storage Standardization Plan; 2022 – 14th Five-Year New Energy Storage Plan; 2023 – New Energy Storage Manufacturing Action Plan

2024-Present

Commercialization & Scale-Up

- Policies Focused on Grid Integration & Dispatch, Driving Marketization and Large-Scale Deployment

2024 – New Energy Storage Grid Integration & Dispatch Notice; 2025 – Renewable Energy Market Reform Notice

According to the CESA Energy Storage Application Branch database, over 2,500 energy storage policies have been issued at the national and local levels. In the past two years alone, 215 energy storage-related policies have been released at the national level.

02

ABOUT US

About ZG

2.1 About Zhiguang

Core Values

Innovation · Responsibility

Unity · Perseverance

Vision

A Pioneer and Advocate of Smart Energy

Business Philosophy

Helping Customers Use Energy Safely Efficiently and Comfortably

Founded: April 9, 1999

Listed on the Shenzhen Stock Exchange in 2007 (SZSE: 002169)

Leveraging the growth of renewable energy, we focus on the large-scale and high-quality development of energy storage, powered by innovations in power electronics, integrated energy, and digital technologies. Through the synergy of capital, talent, technology, and market resources, we aim to become a leading digital energy and integrated energy service provider in China and a globally influential technology enterprise group.

2.2 Milestones

Founded

Digital power systems became the core business, marking the first step toward smart energy leadership

Expansion

- Expanded into energy services
- Established energy service and investment subsidiaries
- Acquired Lingnan Cable
- Established a Postdoctoral Research Workstation

Strategic Deployment

- Business Realignment: Established Dedicated Energy Business Units
- Focused on Large-Scale Energy Storage
- Strengthened the “Product + Service + Investment” Model

Listed

SZSE: 002169

Operations span smart grids, energy efficiency solutions, and renewable energy integration & control technologies

Breakthrough

- Established Zhiguang Energy Storage
- Launched Strategic & Industrial Investment Platform
- Established National R&D Platforms
- National Recognition for Innovation & Energy Storage Demonstration
- Invested in CanSemi
- Invested in CSG Energy Storage & Services (SZSE: 003035)

New Chapter

- 15 GWh Manufacturing Capacity Expansion
- Guangdong’s Largest Standalone Storage Project Commissioned (>1 GWh)
- World’s First Grid-Forming Cascaded HV Storage Project
- Two MIIT Innovation Awards
- Cascaded HV Storage Deployments Exceeded 12 GWh

2.3 Manufacturing Parks

Innovation-Driven Industrial Upgrading

Yunpu

Power Electronics R&D and Manufacturing Park

Nansha

Power Transmission R&D and Manufacturing Park

Headquarter

Zhiguang Integrated Energy Industrial Park

Yonghe

Cascaded High-Voltage Large-Capacity Energy Storage R&D and Smart Manufacturing Park (10 GWh)

Zengcheng

One Platform, One Industry, Three Laboratories — Building a Leading Energy Storage Cloud Platform

2.4 Safe & Smart Manufacturing

Accelerating smart manufacturing transformation through advanced automation, AI, big data, and IoT technologies, enabling higher productivity and quality with lower operating costs and energy consumption.

- **Standardization**

Certified to ISO 9001, ISO 14001, and ISO 45001 Management Systems for Quality, Environmental, and Occupational Health & Safety Management.

- **Digitalization**

Leveraging advanced IT, intelligent equipment, automated production lines, and industrial internet platforms to integrate resources, design, production, energy management, and logistics, maximizing efficiency and operational value.

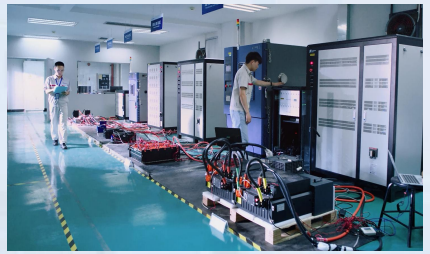
- **Smart Manufacturing**

Over 90% automation has been achieved across key production processes, supported by robots and AGVs, delivering advanced, efficient, and high-quality manufacturing.

2.5 R&D

- Power Electronics Simulation Lab5 MW Energy Storage Test Platform35 kV Mobile Grid-Connection Testing System
- Power Electronics Control Lab
- 35 kV / 20 MW HV Energy Storage Lab
- Dedicated Cloud Data Center
- HV High-Power Electronics Test Lab
- Ultra-Large-Capacity HV VFD Technology
- Lab
- Integrated Energy Lab
- Special Reactor Lab
- Cable PD High-Voltage Test Lab.....










Labs 10+

2.6 Awards & Honors

National Enterprise Technology Center

Postdoctoral Research Workstation

NEA Energy Storage Demo (First Batch)

MIIT

- “Little Giant” SME (5th Batch) Manufacturing–Internet Integration Pilot
- MIIT Energy-Saving & Carbon-Reduction Catalogue
- Energy Storage Innovation First Prize
- IT–Manufacturing Integration Pilot Project

National First-Class Society

- CSEE Technical Award – 1st Prize
- China Machinery Industry Award – 1st Prize
- Electric Power Science & Tech Award – 2nd Prize
- China Energy Research Award – 1st Prize

Guangdong Power Electronics Lab

2.7 Industry Honors

Innovation

- 2024 MIIT Innovation Challenge – 1st Prize (Integrated)
- 2024 MIIT Innovation Challenge – 1st Prize (Individual)
- 2024 MIIT Energy-Saving Catalogue
- 2024 CSEE Science & Tech Progress – 2nd Prize
- 2023 Jiangsu Sci-Tech Award – 2nd Prize
- 2023 China Machinery Industry Award – 2nd Prize
- 2025 Machinery Industry Invention Award – 1st Prize
- 2025 MIIT Innovation Challenge – 3rd Prize
- 2022 CPEA Science & Technology Award – 1st Prize
- 2022 CES Science & Technology Award – 2nd Prize
- 2022 Beijing Science & Technology Progress Award – 2nd Prize
- 2016 Guangdong Science & Technology Progress Award – 2nd Prize
- 2011 Hubei Science & Technology Progress Award – 1st Prize

Industry Leadership

- 2019–2021 China Top 10 Energy Storage PCS Enterprises
- 2022 China Energy Storage Industry – Top Innovation & Growth Award
- 2023 Top 10 Energy Storage PCS Suppliers (Overseas Market Shipments)
- 2023 Top 10 Energy Storage System Integrators (Domestic Market Shipments)
- 2024 New Energy Storage Industry – Grid-Side Energy Storage Project Leadership Award
- 2024 Energy Storage Industry – Grid-Forming Energy Storage Excellence Award
- >70% Market Share in Cascaded High-Voltage Energy Storage

2.8 Innovation Achievements

Patents	Software Copyrights	Standards Participation
600+	400+	110+

- Energy Storage Converter Control Method & Controller (Patent ZL201611187286.4)
- Cascaded High-Voltage Converter DC Voltage Control Device & Method (Patent ZL201711346035.0)
- Output Voltage Control Method & Grid Adaptability Testing Platform (Patent ZL201910481234.5)
- 1500Vdc Modular Energy Storage PCS Software (2023SR0419583)
- RTLAB FPGA Control Software for Cascaded HV PCS (2024SR1485553)
- BESS Real-Time Status Analysis Software (BAMS RealDataAnalysis) (2025SR0250229)
- Maintenance Code for Electrochemical Energy Storage Power Stations (GB/T 42315-2023)
- Lithium-ion Battery for Energy Storage (GB/T 36276-2023)
- Prefabricated Cabin-type Li-ion Battery Energy Storage System Specification (GB/T 44026-2024)

2.9 Marketing Network

- Algeria
- Ethiopia
- Angola
- Bolivia
- Pakistan
- North Korea
- Timor-Leste
- Russia
- Philippines
- Democratic Republic of the Congo
- Kazakhstan
- South Korea
- Kyrgyzstan
- Ghana
- Cambodia
- Rwanda
- Malaysia
- Myanmar
- Nepal
- Namibia
- Tajikistan
- Thailand
- Turkey
- Mongolia
- Uzbekistan
- India
- Indonesia
- Vietnam
- Chad

40+

Products exported to countries and areas

6 Regional Marketing & Service Networks

40+ Subsidiaries and Research Institutions

2.10 Key Customers

智光 Zhiguang

4,000+

Large and medium-sized enterprise groups across China

03

CORE BESINESS

3.1 Core Businesses

1 Digital Energy Technologies & Products

- **ZGE**

HV VFD System
HV SVG
Neutral Grounding System
Shore Power System
Grid-Integration Mobile Test Vehicle

- **Zhiguang Energy Storage**

Grid-Forming Storage
Cascaded HV Storage
LV String Storage
SST
5S Smart Cloud Platform

3 Power Cables

Lingnan Cable Plant

HV / EHV Cables
MV Cables
LV Cables

2 Integrated Energy Services

- **Delivery**

Full lifecycle delivery of source-grid-load-storage integration projects.

- **Trade**

Providing O&M, VPP, and power market trading services for new energy and energy storage assets.

4 Investment

Equity & Project Investment, and Establishment of Industry Funds

Driving industrial upgrading through capital investment and value chain integration.

3.2 Digital Energy Technologies & Products

ZGE

1. HV Variable Frequency Drive (VFD) System
2. HV Static Var Generator (SVG)
3. Energy Storage Power Conversion System (PCS)
4. Distribution Network Neutral Grounding System
5. Shore Power Supply System
6. Renewable Energy Grid-Integration Testing System

High-Power Power Electronics Innovation Expert

Power Grid Security and Stability Control

Over 3,000 application cases across the power and energy sector.

High-Power Power Electronics Equipment

Serving major power utilities, central SOEs, and leading industrial enterprises for many years.

Green Shore Power Equipment for Ports

Leading provider of shore power equipment in major Chinese ports with 40% market share.

3.2 Digital Energy Technologies & Products

Power Grid Security and Stability Control

High-Voltage Dynamic Reactive Power Compensator(SVG)

≤4ms ↓	≥99% ↑	＜2% ↓
Full Power Response Time	System Efficiency	Output Current Distortion (THD)

- Reactive Power & Voltage Stability System for Renewables and Grids
- Up to 120 MVar / 35 kV, air- or water-cooled
- 3,000+ applications across utilities & industry

Distribution Network Neutral Grounding System

- Substation & distribution network grounding fault detection system (multi-mode, multi-type solutions)
- 13,000+ applications across utilities & industry

3.2 Digital Energy Technologies & Products

High-Power Power Electronics Equipment

HV/LV VFD & Soft Starter

25MW
Power Rating up to

20-30% ⬆
Average Motor Efficiency Improvement

15000+
Global Installed Base

- Domestic substitution in major projects; contributor to industry standards
- Long-term partnerships with major utilities and leading industrial enterprises

Grid-Forming Renewable Energy & Energy Storage Grid-Connection Testing Equipment

6~35kV/5~20MVA
Test Capacity

- Customized grid-connection testing tools for power plants
- Hundreds of on-site tests across utilities, certification bodies, and energy groups

3.2 Digital Energy Technologies & Products

Shore-to-Ship Power Supply System

Providing 20 MVA-Class Shore Power Systems for Port Customers

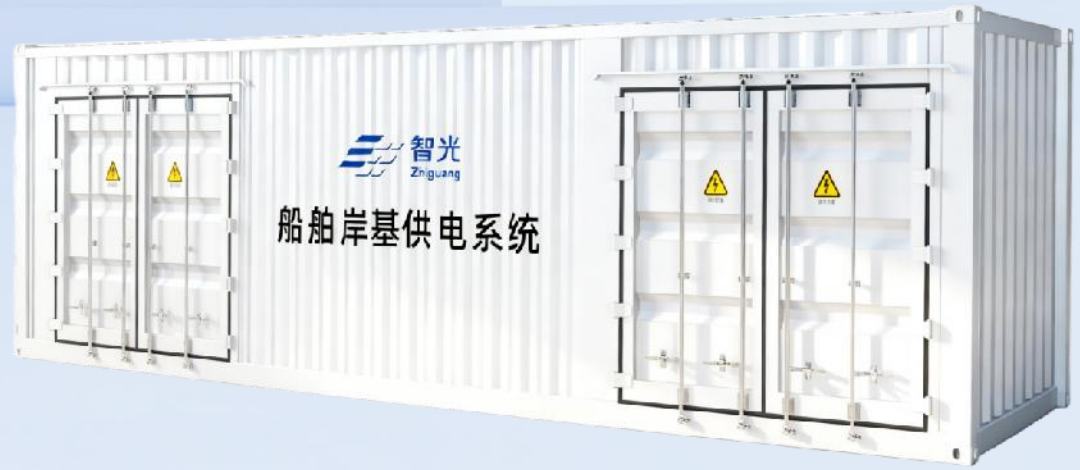
- Port energy storage, reefer container storage systems, and digital integrated energy solutions
- Enhancing port energy efficiency and reducing energy costs

All-Spectrum, Multi-Scenario Intelligence

- 300+ berths deployed across major ports in China
- Routine shore power supply in key ports including Yingkou, Qingdao, Xiamen, and Shenzhen Shekou

Excellent power quality

＜1%	＜2%	＜3%
Output Voltage Harmonics	Three-Phase Output Voltage Unbalance	Input Current Harmonics
＜1%	0.01Hz	＞97%
Load Voltage Regulation	Output Frequency Resolution	Input Power Factor



3.2 Digital Energy Technologies & Products

Zhiguang Energy Storage Technology

- Grid-Forming Energy Storage System
- Cascaded High-Voltage Energy Storage System
- Low-Voltage String Energy Storage System
- Residential & Modular Energy Storage System (Overseas)
- Solid-State Transformer (SST)
- Energy Storage 5S Smart Cloud Platform

Leading Cascaded High-Voltage Energy Storage Technology

Generation Side

Used for thermal–storage joint frequency regulation on the generation side and storage for utility-scale wind and solar power plants.

Grid Side

Responds to grid flexibility needs by providing system-level support for peak shaving, frequency regulation, and backup power, improving overall grid stability.

User Side

Applied in user-side scenarios such as industrial parks, residential areas, EV charging stations, data centers, ports and islands, 5G base stations, and microgrids.

3.2 Digital Energy Technologies & Products

Energy Storage Equipment and Systems

Cascaded HV Large-Capacity Energy Storage System

100MW
Single-unit power up to

MS response
One-click black start

≥92%
Conversion efficiency

No circulating current
Battery current fully controllable

- Simple power plants, strong grid-forming, high efficiency, and high safety
- Used in large-scale renewable and shared storage projects of major SOEs such as CSG, SGCC, Huaneng, Huadian, CHN Energy, Datang, SPIC, and CTG

LV Energy Storage System

1000V&1500V
Supports DC side

60&125&180&215kW
Multiple PCS power options

- Modular design with parallel operation, supports demand response and reduces energy cost
- Used in C&I and renewable co-located storage projects in China and abroad

3.2 Digital Energy Technologies & Products

Digital Energy Infrastructure

Coota 1.0 Solid-State Transformer (SST)

10kV~800V
Single-stage DC conversion

98.5% ↑
System efficiency up to

1~4.2MW
Flexible capacity expansion

Full-time grid-forming
Smart power routing

Focus on core pain points of 3 scenarios

- **AIDC：** Power bottlenecks from computing growth
- **EV Supercharging：** High-voltage vs low-efficiency fast charging gap
- **Source–Grid–Load–Storage：** efficiency, grid-forming, and “4C” (observe, measure, control, adjust)

- Next-generation intelligent power conversion equipment replacing conventional transformers
- Integrated voltage transformation, isolation, power quality management & intelligent dispatching
- 4 key features: high efficiency, high power capacity, comprehensive functionality and bidirectional power flow

3.2 Digital Energy Technologies & Products

“5S”Smart Clouding Platform

PCS

Centered on the cascaded high-voltage direct-connected PCS, offering a full range of PCS products, including low-voltage string and centralized solutions.

BMS

Backed by proprietary BMS technology and a dedicated R&D team, the Company offers battery pack development and manufacturing capabilities.

EMS

Built on power grid control expertise, the Company has established a dedicated EMS subsidiary.

DMS

A digital twin-based intelligent management and early-warning system for energy storage power stations, enabling lifecycle safety and operational optimization.

CMS

A cloud-based intelligent management system for geographically distributed energy storage power stations.

3.2 Digital Energy Technologies & Products

International Products and Systems

- Residential, C&I, Utility-Scale Energy Storage Systems, and Solar-Storage-Diesel Microgrids
- Serving Europe, Japan, Australia, Southeast Asia, the Middle East, India, the United States, South America, and other global markets
- TÜV and UL certified, with multiple international grid-connection certifications and listings

Residential BESS

Products
- AIO
- Hybrid PCS
- Battery Cabinet

Features
- Power：5~10 kW
- Capacity：5~30 kWh
- Single-, 3- and split-phase
- HV & LV Configurations

C&I BESS

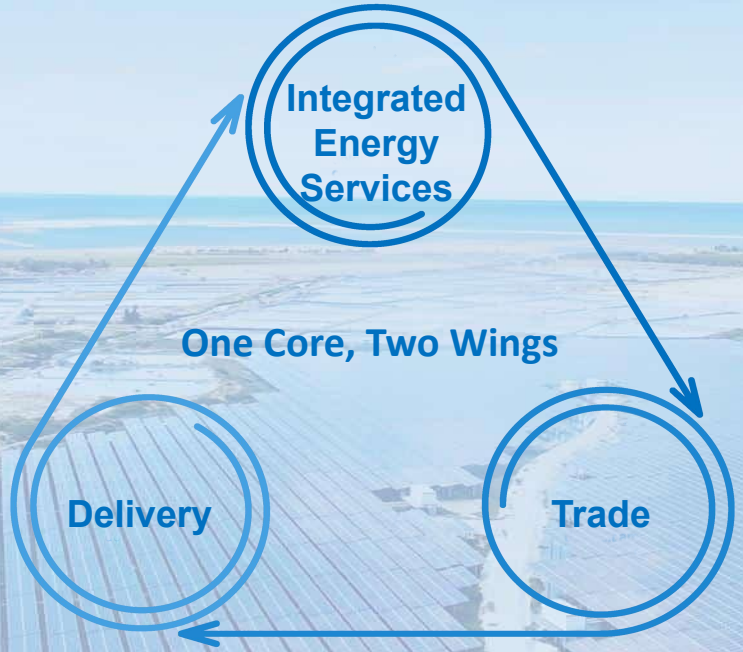
Products
- C&I AIO
- 200 kW PCS
- UPS
- ES+Supercharging

Features
- Air-Cooled / Liquid-Cooled
- LFP 280 Ah / 314 Ah
- 100 kW–2 MW
- 200 kWh–4 MWh
- TÜV & UL Certified

Utility-scale BESS

- LFP 280 Ah / 314 Ah20 ft / 40 ft Containerized or Customized
- Battery + PCS & Step-Up Transformer
- Liquid Cooling
- LV Configuration

3.3 Integrated Energy Services



Leading Source–Grid–Load–Storage Integrator and Energy Operations Expert

Delivery：End-to-End Project Delivery

Full-cycle delivery from feasibility study to grid compliance assessment.

Integrated Energy Services

Source–Grid–Load–Storage Integration & Microgrid Control; Grid Compliance & Performance Evaluation; Industrial Energy Efficiency & Waste Heat Recovery; PV, Energy Storage & Distribution O&M Services.

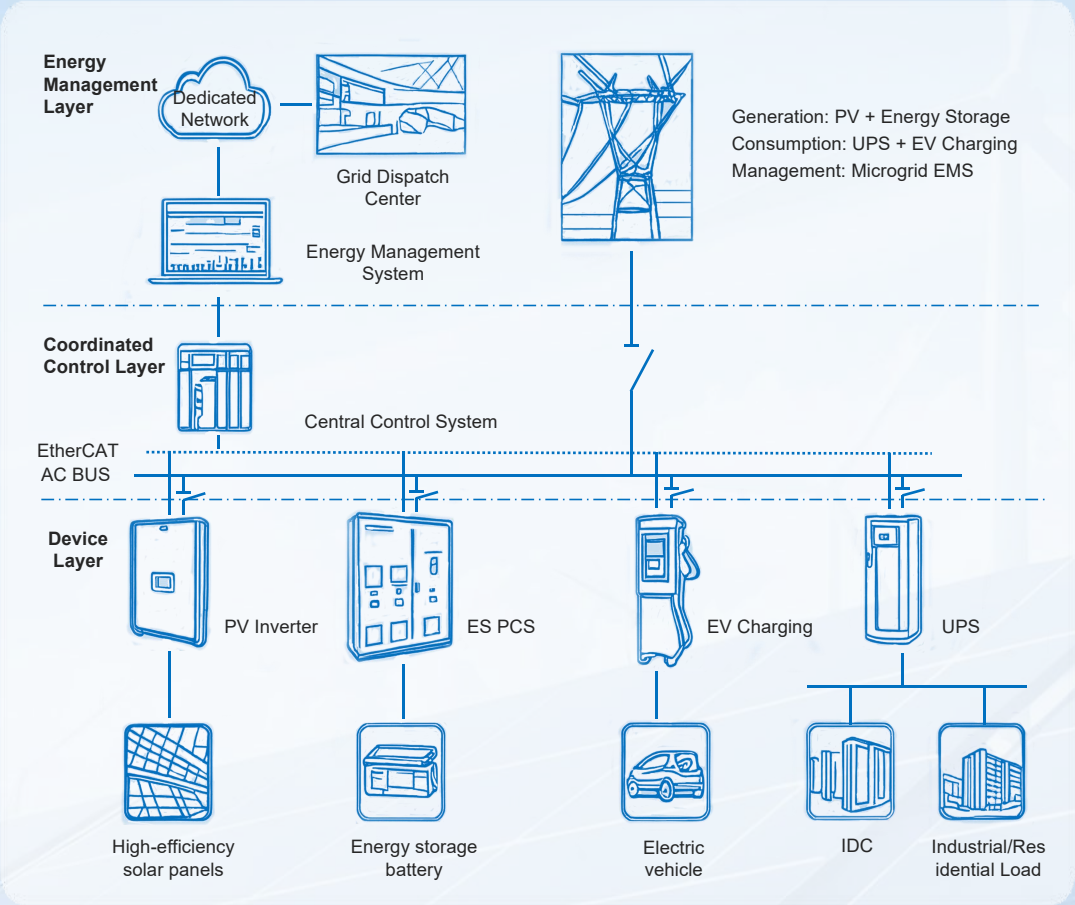
Trade: Renewable Energy Markets

Market analysis & forecasting, trading strategy development & execution, power generation forecasting, asset portfolio optimization, risk management & compliance.

3.3 Integrated Energy Services

Integrated Energy Services Framework

Empowering the green transition of energy-intensive industries and data centers through integrated technologies, customized solutions, grid compliance services, and full-lifecycle support.



Core Capabilities

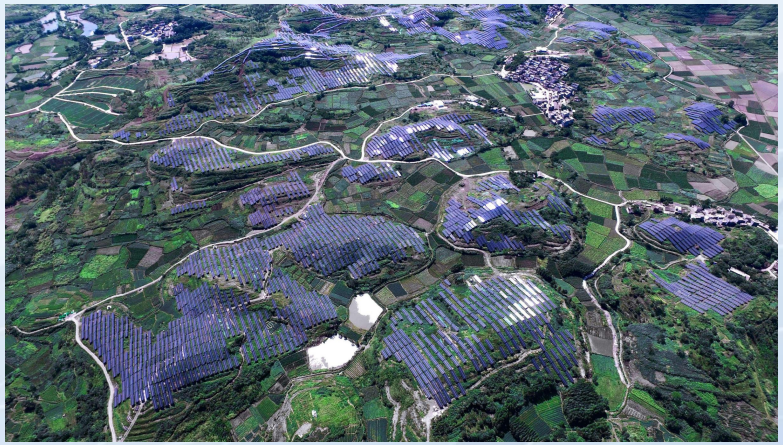
- Microgrid Control & Solution Expertise
- Grid Compliance & Performance Evaluation
- Source–Grid–Load–Storage Project
- ExecutionResource Integration & Lifecycle Services

3.3 Integrated Energy Services

Delivery Sector

Full-Lifecycle Delivery of Source–Grid–Load–Storage Projects

With a standardized end-to-end delivery system covering technology selection, solution design, cost control, and construction management for PV and energy storage projects, we ensure precise control of schedule, quality, and cost through professional project execution and process management, delivering superior project performance and expected returns.



Key Focus Areas

- **Power Engineering & Consulting**

  End-to-end technical and consulting services for power projects, ensuring optimized performance, economic efficiency, safety, and sustainability.

- **EPC Projects**

  EPC services for renewable energy projects, including PV and energy storage, with full-process management covering design, procurement, and construction.

- **Grid Connection Testing & Performance Evaluation**

  Specialized testing and evaluation services to verify technical performance and control strategies, ensuring grid compliance and reducing integration risks.

3.3 Integrated Energy Services

Trading Value Creation

Renewable Power Market Trading

Covering O&M, retail, and operations, we develop capabilities in spot market trading and renewable plant operations, integrating O&M, trading coordination, and strategies to expand market-based power trading.

Key Areas

- **Maintenance**

  Deliver PV and energy storage O&M services via an intelligent O&M platform.

- **Operation Trading**

  Deliver services in renewable energy operations, spot markets, demand response and virtual power plants.

3.4 Power Transmission

Advanced Manufacturing & Testing Capabilities for High-Voltage Cables

- **Equipped with world-class production and testing systems**, including Finland Maillefer 500kV vertical production lines, Swiss HAEFELY testing facilities, 700kV high-voltage and partial discharge testing systems, 3,000kV impulse voltage test systems, and thermal cycling test equipment.
- Specializing in **high-voltage and extra-high-voltage cables, medium- and low-voltage cables, specialty cables, wires, and control cables**.
- Serving state-owned utilities led by China Southern Power Grid, with products applied in hundreds of landmark projects, including Guangzhou Metro, Baiyun Airport, Tianjin Olympic Center, and the Boao Forum Conference Center.

High-End Cable R&D, Manufacturing & Delivery Expertise	Specialized in Multiple Voltage Levels	Plant Area
20 years+	6kV~500kV	110k+㎡

3.4 Power Transmission

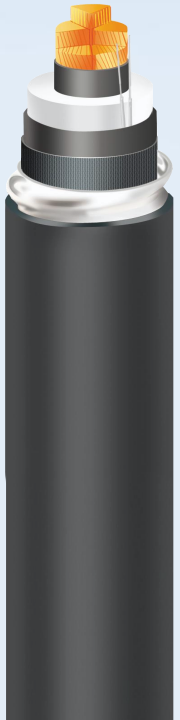
HV & EHV Cables (110kV~220kV)

Copper Wire Screened Power Cable (Circular Compact Conductor)YJAS

Copper Wire Shielded Power Cable(Segmented Conductor)YJAS

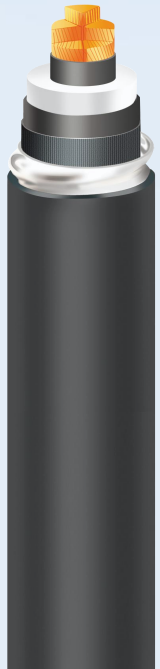
Smart Power Cable

YJLW03-Z-G



Corrugated Aluminum Sheathed Power Cable

YJLW03-Z



Medium-Voltage Cable (6kV~35kV)

XLPE Insulated Power Cable

YJV22

XLPE Insulated Power Cable

YJV

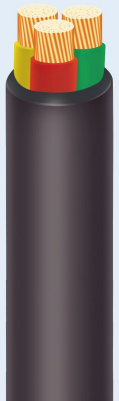
Low-Voltage Cable 1kV~3kV

XLPE Insulated Power Cable

YJV22

XLPE Insulated Power Cable

YJV

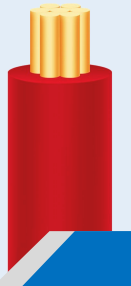


Control Cable

450/750V

Low-Voltage Building Wire

300/500V



3.5 Investment Areas

Empower the industrial value chain, **support business growth**, develop emerging strategic sectors, and **drive industrial transformation and upgrading**.

3.5 Investment Areas

Internal investments: empowering business growth

External investments: driving industrial upgrading and supply chain strengthening

Digital Energy
[ES, Power Electronics and Power Equipment]

- 广州储能 GESG
- CanSemi 粤芯半导体
- TREX 巨风半导体

Integrated Energy
Power Station Management and Operation, Energy Management

- 南网能源 CSG ENERGY
- 粤财创投 YUECAI VENTURES — Yuechuang Photovoltaic & Energy Storage Fund

Fostering Industrial Upgrading

- Semitronix
- OnMicro 昂瑞微
- 慧智微 SMARTER MICRO
- 广州开发区产业基金 GDD Industry Fund — Zhiguang Guangkai Xinneng Fund

3.6 Key Projects

- Zhiguang Electric is a contributor to China's dual-carbon goals. Its **Qingyuan 508MW/1,016MWh independent energy storage project**, currently the largest operating standalone storage plant in Guangdong, has been put into operation.
- In 2024–2025, the company is investing in additional projects in **Foshan (208MW/416MWh) and Meizhou (200MW/400MWh across two phases)**.
- Once completed, total capacity will reach **916MW/1,832MWh**, supporting China's new power system and renewable energy development.

Construction starts on Phase II and III of the Qingyuan Qingcheng District Independent Energy Storage Project

Construction starts on the Foshan Gaoming District grid-side independent energy storage project

Construction starts on Phase I of the Meizhou Pingyuan Smart Energy Storage Project

Commencement of the Meizhou Pingyuan (Phase II) Smart Energy Storage Power Station Project

Energy Expert to Global ESS Users

DEDICATION TO SMART ENERGY