



# SHANGHAI ELECTRIC

Committed to the Carbon Peaking and Carbon Neutrality Goals



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# Company Profile

# Shanghai Electric Overview



## Large comprehensive equipment manufacturing group

Shanghai Electric Group is a world-class comprehensive high-end equipment manufacturing enterprise, focusing on three business areas of smart energy, smart manufacturing, and smart infrastructure, to provide customers with industrial-grade green intelligent system solutions.

**381.6b CNY**

**Total assets**

**75,000**

**Employees**

**7,268**

**Valid patents**

Shanghai Electric relies on its comprehensive equipment advantages and actively lays out multi-energy storage solutions of molten salt, compressed air, pumped storage, lithium-ion battery, liquid flow, flywheel, etc. It can provide one-stop "high-quality storage" system solutions for the power supply side, power grid side, industrial and commercial side, etc.



# Major Business Areas

## ESS

Generation side



Grid side



User side



## Backup power

5G base station



UPS



## Power supply

Commercial vehicle



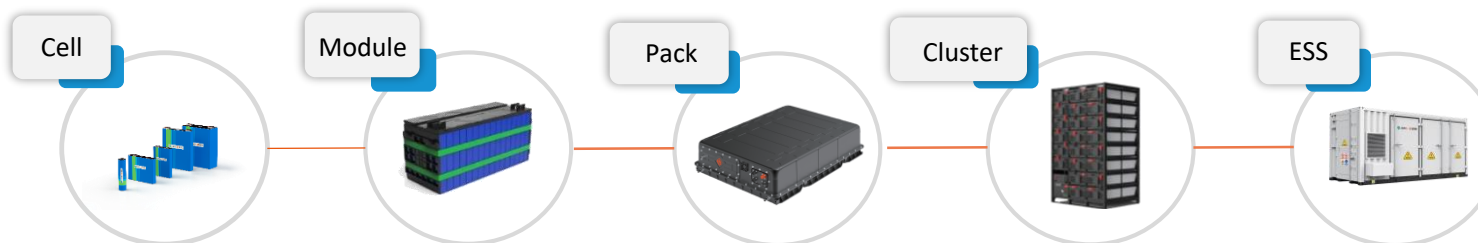
Low-speed vehicle



Two-wheeled vehicle



Cover the whole industry chain, from battery cells to energy storage systems



# R&D



Nantong production base is planned to have an annual output of 10GWh and the capacity of the first phase is 5GWh, which has been achieved since September 2020. The base, integrating research and development, testing, and production, is the most advanced and largest-scale industrial base for lithium-ion battery energy storage systems in East China.



R&D  
7000m<sup>2</sup>

CNAS  
certification



Fully functional  
laboratories  
20+

Intelligent  
manufacturing  
Digital production  
line

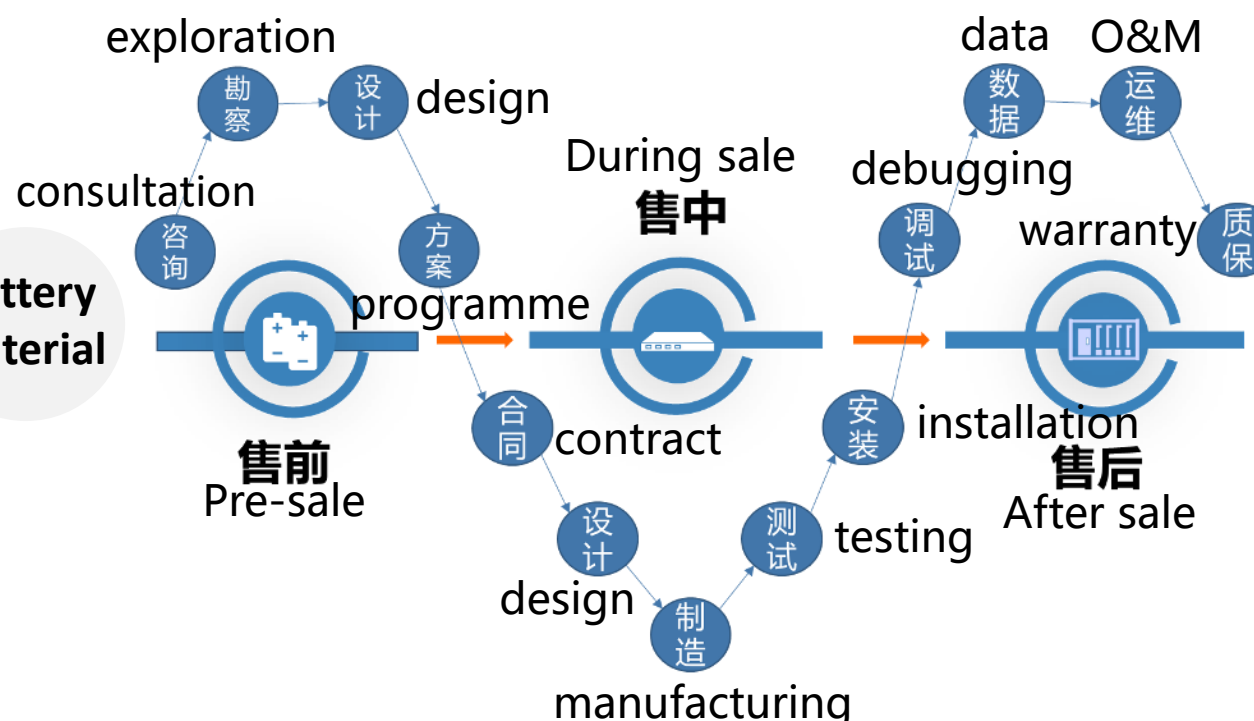
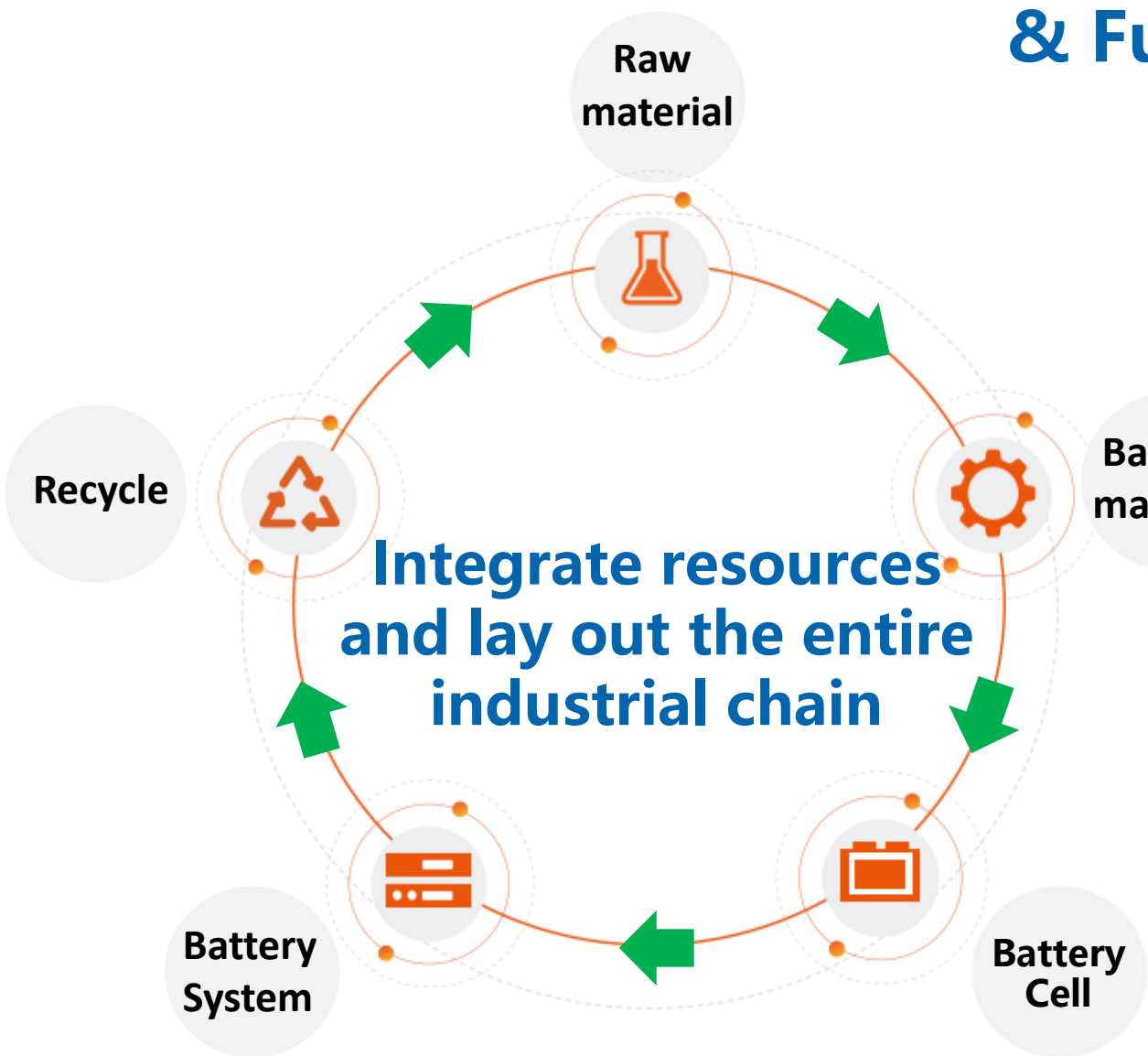


MES system  
Comprehensive  
quality control



# Whole-industry-chain Layout

## & Fully-serviced Lifecycle



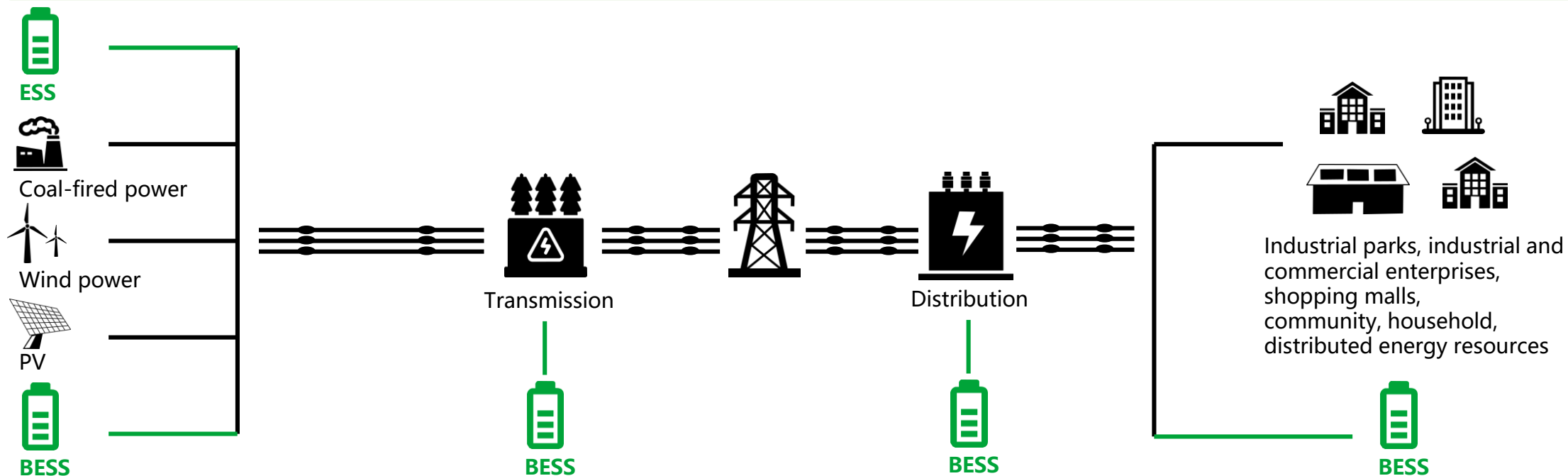


# Products



# Major Applications of BESS System

Energy storage can be valuable at all stages of the energy lifecycle



## Power generation

- Consumption of new energy and reduction of wind and solar curtailment
- Electrical Ancillary Services: Peak and Frequency Regulation
- Smooth fluctuations and track planned efforts

## Power transmission

- Deferring investment in power transmission equipment
- Improving power quality and reliability
- Improving the stability of the transmission grid

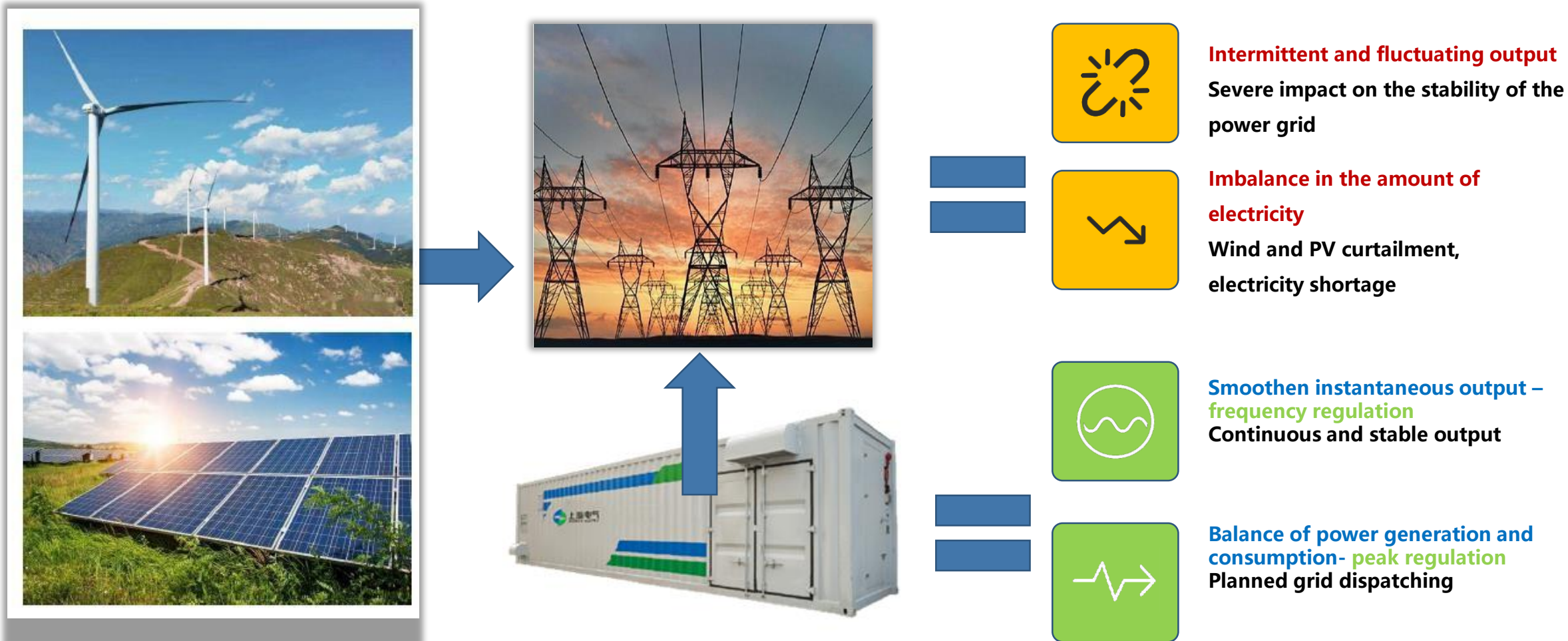
## Power distribution

- Peak load demand alleviation and delay capacity expansion
- Electricity sales and integrated energy management
- Improving the power quality and reliability of power distribution

## User side

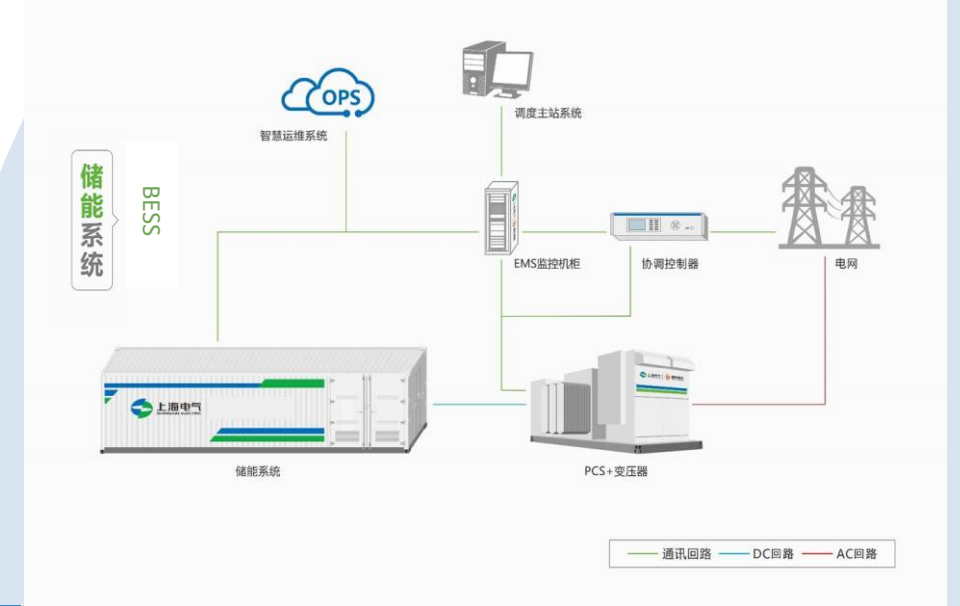
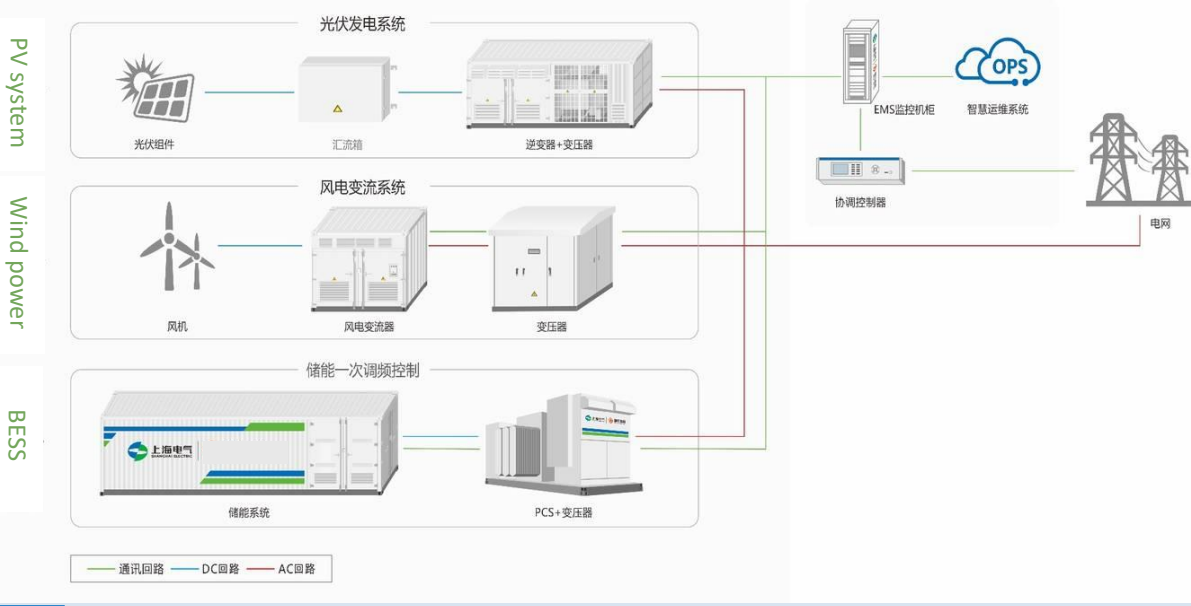
- Demand-side response/demand control/peak shaving
- Local consumption of distributed energy resources
- Critical load backup power supply

# Pain Points and Responses of Large-scale Wind Power and PV Bases



Use energy storage to improve the level of power consumption, solve the contradiction between supply and demand, and create conditions for the innovation of multi-energy complementary mode

# Solutions – Wind-PV-ESS/Independent ESS



## Applicable scenarios

- Wind power /PV+ESS

## Program features

- Reduce curtailment of solar and wind, smooth power output, and improve the stability of grid connection
- Improve the planned tracking output of new energy stations
- Millisecond frequency modulation response time for energy storage

## Applicable scenarios

- Independent energy storage power stations participate in grid ancillary services

## Program features

- Provide a variety of auxiliary services, including peak regulation, frequency regulation and voltage regulation
- High accuracy and fast response time, up to the millisecond level

# Product



## Battery Cell

- Lithium Iron Phosphate Battery Cell
- Designed For ESS
- Long Life Cycle



## ESS Solution

- Installed and ready to use, maintenance-free, unattended
- High Safety, High Efficiency
- Air cooling + liquid cooling optional



## Backup Power Solution

- High Energy Density
- High Safety
- Module Design, Easy for Use and Maintenance











## Power Solution

- Bus "Power Core" for CIE
- High safety and long lifespan
- Efficient operation over a wide temperature range

Cover full industry chain from battery cells to energy storage systems

# Battery Cell

Lithium iron phosphate battery cells with high energy density and long cycle life in full energy storage scenarios

Product Image								
Rated Capacity	27Ah	52Ah	88Ah	96Ah	100Ah	105Ah	300Ah	314Ah
Dimension	20.5*100*144.5	28.5*148*115	175*27.5*200	175*27*200	175*27*200	175*27*200	175.4*81.2*200.3	174.7*71.7*203.4
Weight	598±5	966±5	2060±50	2020±60	2070±60	2060±50	5998±300	5650g±200
Rated Voltage	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Charge and discharge Rate	6C	4C	6C	1C	0.5C	0.5C	0.5C	0.5C
Energy Density	> 144	> 175	≥136	≥150	≥155	≥165	≥160	≥175
Energy storage Scenarios	UPS	UPS	UPS	Energy storage power type	Energy storage energy type	Communication base station	Energy storage energy type	Energy storage energy type

**High-end production equipment + online monitoring + offline detection+6 short circuit tests + 2 helium checks to guarantee the quality of finished battery cells**



## ElitePower Air cooling ESS solution



### High efficiency High safety

- Meet high power 1P application scenario, FM mainstream
- Intelligent air-cooling control strategy, optimally reduce system energy consumption
- DC side efficiency  $\geq 95.5\%$  for Energy type

## EliteCool Liquid cooling ESS solution



### Fine management Intelligent operation and maintenance

- Fine-tuned thermal management operation strategy
- Automatic cluster switching, highly integrated
- Accessing the OPS system for comprehensive monitoring and improving operational efficiency
- Single container capacity 3.42MWh, 4.56MWh, 5MWh

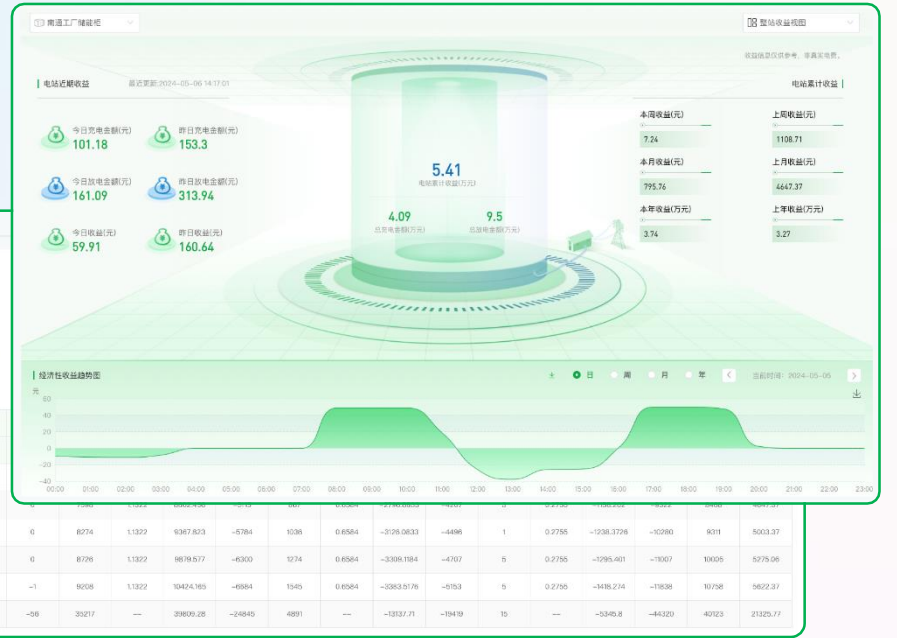
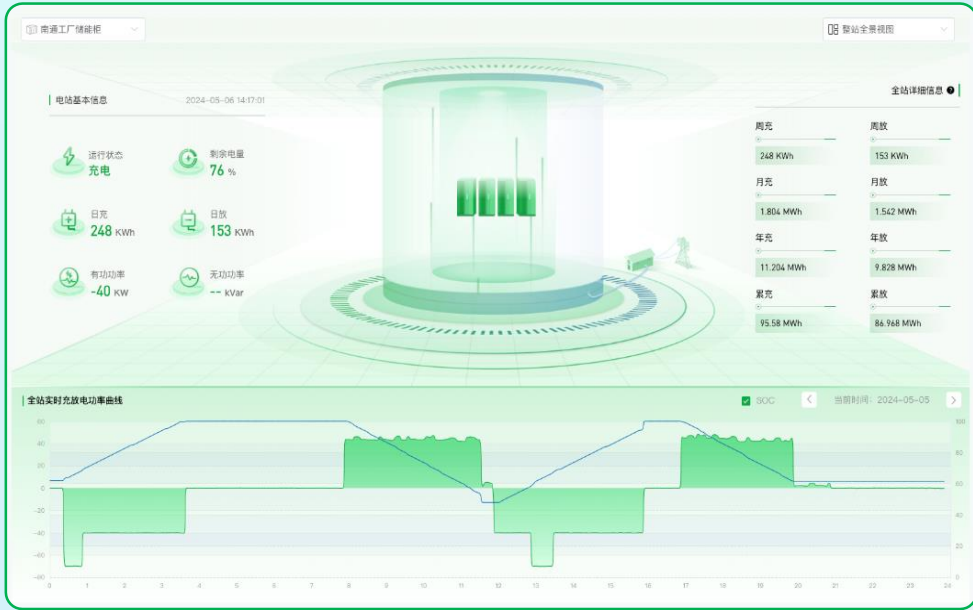
## C&I all-in-one Solution



### Standardized design Strong adaptability

- Standardized and modular design
- Equipped with parallel and off grid operation and switching functions
- Applied to high altitude, high temperature and humidity, high wind and sand, and high salt mist environments

# Smart OPS



## Comprehensive perception of multiple scenes in all directions

- **Visual monitoring:** monitoring through multiple visual views to meet the monitoring needs of different demand scenarios;
- **Multi-level monitoring:** monitoring power plants, equipment, and components at different levels, making monitoring more accurate and effectively solving operational and maintenance problems;
- **Charging and discharging strategies:** With remote control capability and rich charging and discharging strategies, providing flexible and variable strategy mechanisms for different customers, improving resource utilization, reducing energy waste, and improving economic benefits;
- **Comprehensive reports:** reports for whole power plant and single equipment based on multi-time dimensions, allowing customers to have a clear understanding of the production situation of power plants and equipment;
- **Mobile operation and maintenance:** WeChat mini program version, meeting the needs of mobile operation and maintenance scenarios.

## Economic benefits

**Operator side:** Support real-time understanding of the operation status of owner's equipment, provide better equipment services for customers, and help spread product revenue generating capabilities

**Owners/Contractors:** Improve equipment and revenue perception, timely understand revenue situation, establish good revenue expectations, and enhance the credibility of owners/channels.

# Backup Power

## 5G base station backup power



- 48100 product height 3U;
- Small size and greater energy;
- Centralized control, real-time monitoring, and unmanned operation;
- The intelligent lithium battery can be used in parallel with lead-acid

## UPS backup power



- Safe and reliable, intelligent operation and maintenance management;
- Long cycle life and low cost throughout the entire lifecycle
- Can provide 10min-2h standard emergency backup power demand

## Residential energy storage



- Protocol that can match multiple inverters on the market
- Implement "spontaneous self use" on the user end to ensure continuous power supply and save electricity costs.



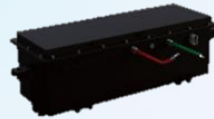
## Bus power



### High safety and long life

- High safety performance and good cycle life
- The battery pack has undergone comprehensive and rigorous safety testing

## Low-speed car power



### Powerful and long-lasting

- Using lithium iron phosphate batteries with high energy density
- Integrated design with high grouping efficiency

## Two-wheeled vehicle power



### Standardization and lightweight

- Standardized and lightweight design
- Equipped with intelligent battery management system and efficient thermal management system



# Project Presentation

# Projects Worldwide

北美洲1x60MW  
生物质焚烧发电项目

UK 100MW/100MWh REP1&2 Energy Storage Project

塞尔维亚潘切沃161MW联合循环  
燃机电站项目

日本北海道2.4MWp光伏电站项目

巴基斯坦恰希玛核电站

迪拜700MW光热和250MW  
光伏电站项目

澳大利亚Cultana343.7MW  
光伏电站项目

吉布提230kV  
铁路供电项目

- Anhui Jinzhai 100MW/200MWh Energy Storage Demonstration Project
- Gansu 50MW/200MWh Energy Storage Project
- Gansu 20MW/40MWh Wind Storage Project
- Qinghai 32MW/64MWh Shared Energy Storage Demonstration Project
- Hunan 20mw/40mwh Energy Storage Power Station Demonstration Project
- Guangdong 26MW/13MWh Thermal Power Frequency Modulation Energy Storage Project
- Shanghai 3MW/12MWh Smart Energy Storage Project
- Gansu 40MW/90MWh Shared Energy Storage Power Station Project
- Xinjiang 60MW/180MWh Energy Storage Project
- Jilin 10MW/20MWh Energy Storage Project



> 30 projects

Global Project Cases



> 5GWh

Shipment

▲ 境外并购公司

▲ 境外工程项目

▲ 境外子公司、分公司

审图号  
GS (2016) 2950号

# Power Side Projects



## 60MW/180MWh Xinjiang corps energy storage project

- High altitude, high wind and sandstorm energy storage project



## 10MW/10MWh Anhui wind power distribution and storage project

- The first batch of wind energy storage projects in Anhui province



## 2.5MW/20MWh Tibet light storage comprehensive energy project

- High altitude light storage project
- Weak grid support demonstration project for long time backup



## 10MW/20MWh Jilin energy storage project

- - 30°C energy storage project

# Grid Side Projects



## 100MW/200MWh Anhui independent energy storage power station project

- Anhui's first single 100 MW independent energy storage power station
- Anhui's first shared energy storage pilot project



## 26MW/13MWh Guangdong FM energy storage power station project

- 200 meters from the sea
- The frequency modulation project with the highest K value in Guangdong



## 20MW/40MWh Hunan Power Grid Side Energy Storage Project

- Rental model pilot project
- The first domestic grid side liquid cooling pilot project



## 32MW/64MWh Qinghai Photovoltaic Shared Energy Storage Power Station Project

- The first third-party invested shared energy storage project in China
- The largest station building energy storage power station in China

# Grid Side Projects



## 100MW/100MWh UK REP1&2 Energy Storage Project

- The first large-scale overseas energy storage project
- Meet the demand for dynamic service containment



## 103MW/206MWh Anhui Energy Storage Power Station Project

- The largest independent shared energy storage power station with large capacity on the grid side in Anhui Province



## 40MW/90MWh Gansu Compressed Air + Lithium Battery Combined Energy Storage Power Station Project

- State Power Investment Corporation 's first compressed air + lithium battery combination scheme network side shared energy storage innovation demonstration project

# User Side Projects



## 3MW/12MWh Minhang Smart Energy Demonstration Project

- The largest C&I energy storage project in Shanghai



## 500kW/1157KWh Dubai Light Storage Diesel Microgrid Project

- Microgrid demonstration project in high temperature and high wind and sand environment



## 1MW/1MWh Guangdong Microgrid Project

- Microgrid projects in high salt spray environments
- Provide black start services for large wind turbines



## 10MW/40MWh Lianyungang Steel Electric Energy Storage Project

- The first batch of user side energy storage projects participating in the demonstration application of power grid auxiliary services

# Other C&I Energy Storage Projects



- Kunshan Smart Low Carbon New Energy Microgrid Project
- Tibet Optical Storage Microgrid Project
- C&I energy storage projects such as Nantong and Qingdao





# Backup Power Projects



FiberHome Indonesia and  
ZTE Overseas 5G  
Communication Base Station  
Project

Baidu Lithium Battery HVDC  
Project, Kehua Xiamen Financial  
Center, Shanghai Customs  
School, Bank Branch and other  
UPS backup power projects



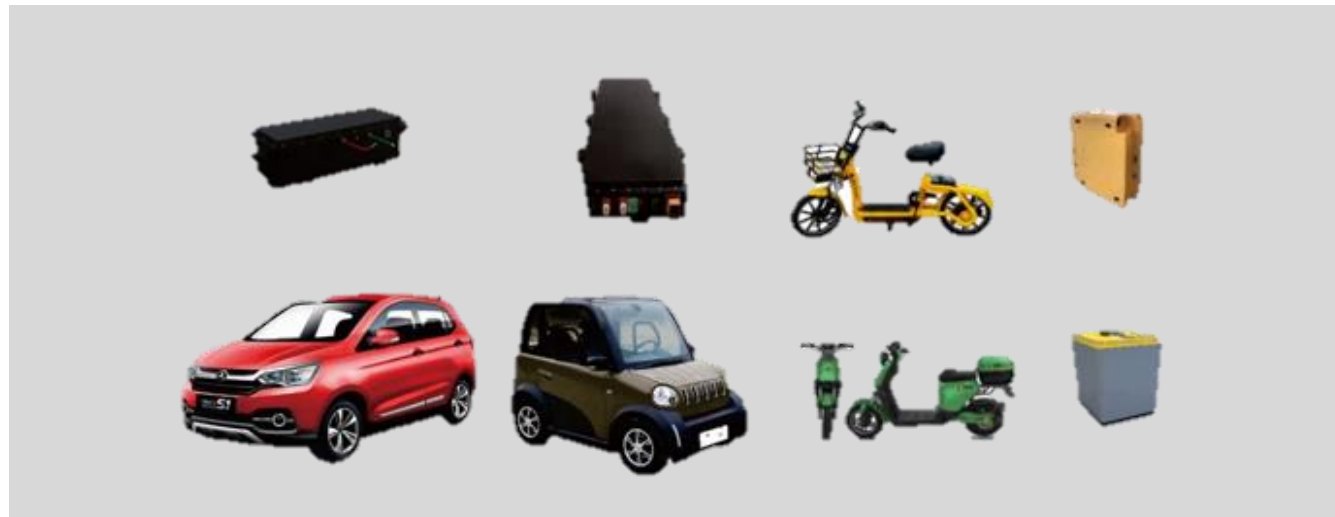
# Power Projects



Shanghai and  
Nantong Bus  
Project

Jianghuai, BAIC, and  
Hongri low-speed vehicle  
projects

Yadi, Xiaoliu and other  
two wheeled vehicle  
projects



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SHANGHAI ELECTRIC CREATE OUR FUTURE TOGETHER

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