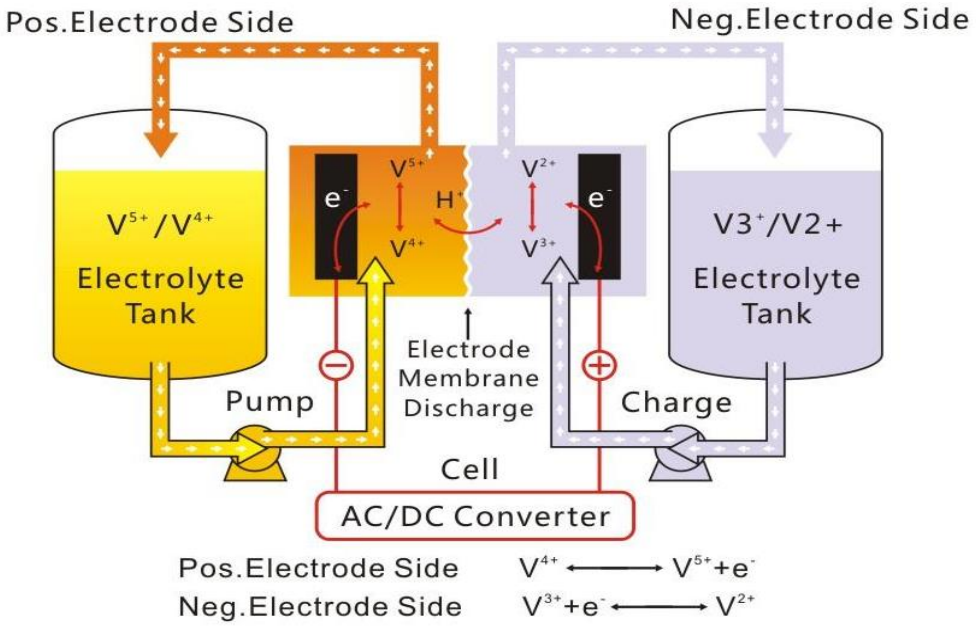
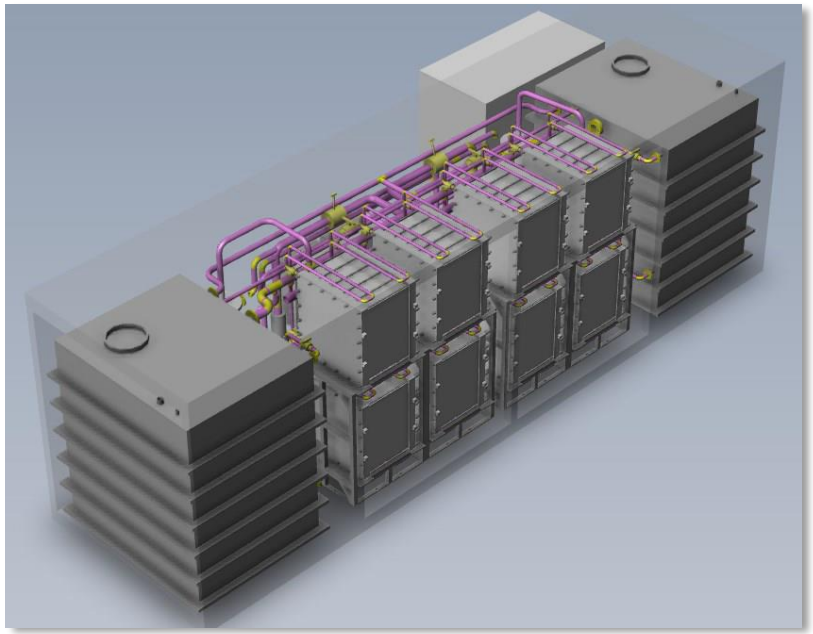
Shanghai Electric Flow Battery Energy Storage Technology

Long-duration energy storage solution provider with safe, green and economical BESS equipment

Technology Introduction-Vanadium Redox Flow Battery(VRB)

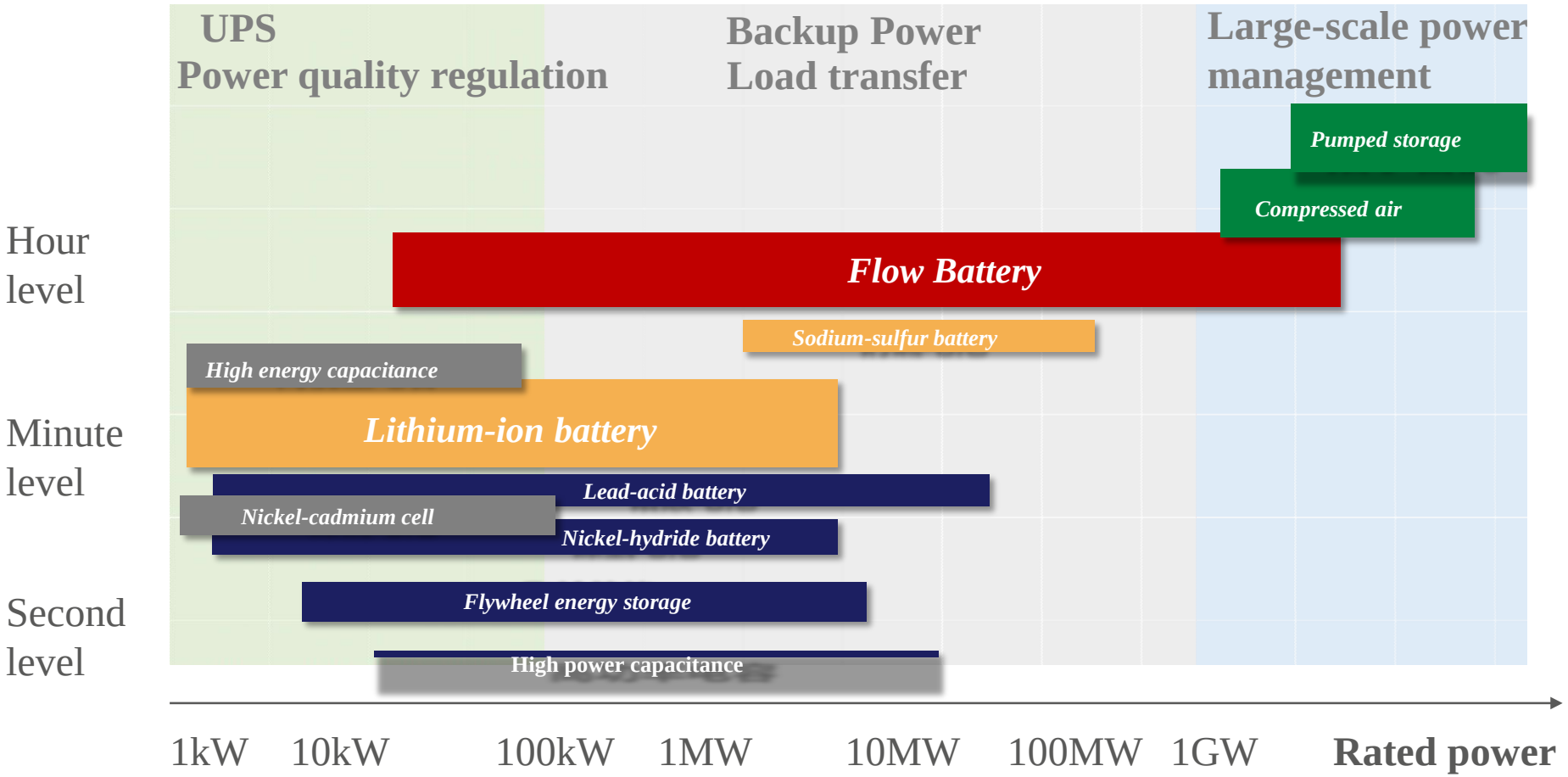




Safe	**Long-Cycle Life**	**No Attenuation**	**Expansion**	**NO Pollution**
Aqueous Electrolyte Regular Temp & Pressure No Explosion Risk	Life-time > 20yrs Cycle-time > 20,000 Deep Charge	Real-Time Monitoring Online Capacity Recover Electrolyte100%recyclable	Modularization of Power Unitization of Capacity Serialization of Components	Abundant Raw Material Environmental Friendly

Applicable to energy storage scenarios that require high security, large capacity, long life, and less maintenance.

Flow Battery ADAPTS to Long-duration Energy Storage



Flow Battery

Long cycle life

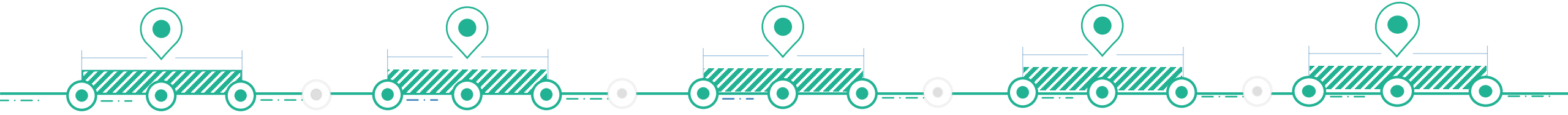
High physical safety

Environmental Friendly easy to recycle

The most suitable technical route for long-duration energy storage

Shanghai Electric Flow Battery -Development History

上海电气 SHANGHAI ELECTRIC



2011

R&D Project Approval

2019

In November, Shanghai Electric Energy Storage Technology Co., Ltd. was founded.

2022

Completed MW-level projects in China, and established cooperation in Japan, Spain and other overseas regions

2023

In September, the A round of financing was completed, and we obtained 400 million RMB investment.
B round of financing starts.

2024

Completed 50MWh projects in China, and started 200MWh project construction.

Shanghai Electric Energy Storage Technology Co., LTD.

Shanghai Electric Energy Storage Technology Co., Ltd. is an energy storage platform company invested by Shanghai Electric Group. It is committed to providing customers with green, economic and efficient energy storage equipment and comprehensive energy solutions, and owns the core independent intellectual property rights of battery and system integration.

Hefei

Manufacturing Base

- **Annual production capacity**

300MW/1GWh

Stack manufacturing,
System integration,
System testing,
Production R&D




Marketing Center / R&D Center

Solution Design

New system flow battery development



Shanghai

Shanghai Electric Flow Battery - Factory Layout in China

Baicheng factory in Jilin province

Area: 30,044.84 square meters
Annual production capacity: 1GWh
Production date: 2023

Yancheng factory in Jiangsu province

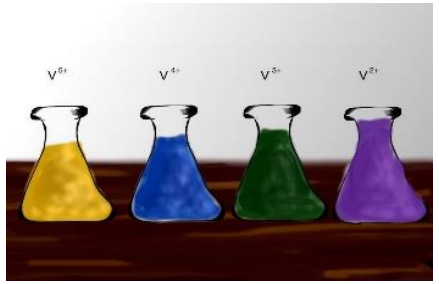
Area: 11,000 square meters
Annual production capacity: 1GWh
Production date: 2022

Chaohu factory in Anhui province

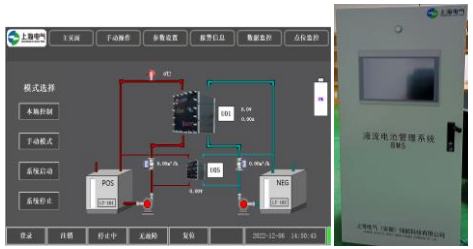
Area: 26,000 square meters
Annual production capacity: 1GWh
Production time: 2020

VRB Energy Storage System Composition

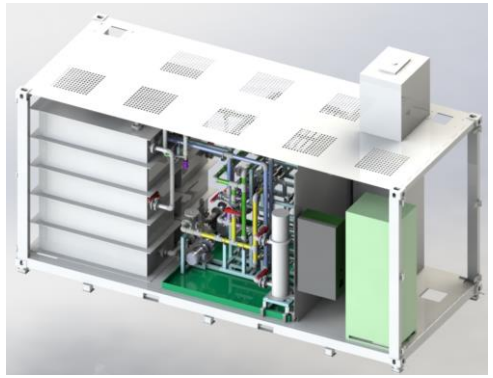
VRB Stack



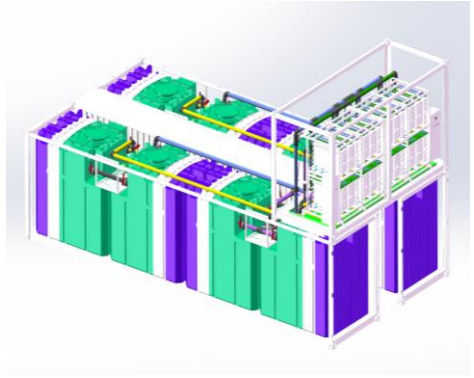
Electrolyte



BMS and ancillary equipment



Single Container System



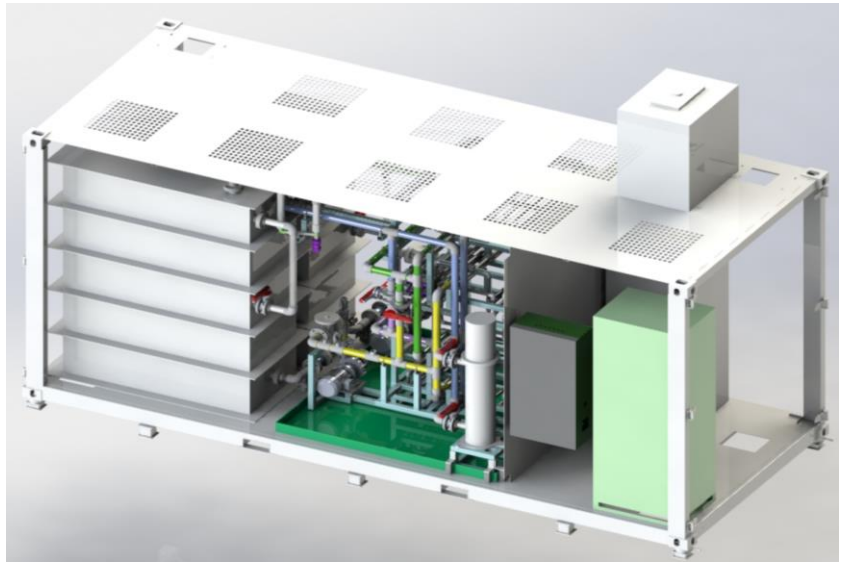
Basic Unit for Large System

Solution Design for Large System

Typical VRB Stack – 42kW

Model	42kW Stack
Rated Power	42 kW
Current Density	140 mA/cm2
Operating Voltage Range	52 – 83.2 Vdc
Maximum DC current	801 A
Depth of Discharge	100%
Charge-discharge Response Time	< 100 ms
Dimensions (L x W x H)	1390×730×680 mm
Total weight （t）	About 1200 kg
Operating ambient temperature	5 – 45 ℃
Install moving tool	forklift

Typical Single System -- 50kW/200kWh Container Solution



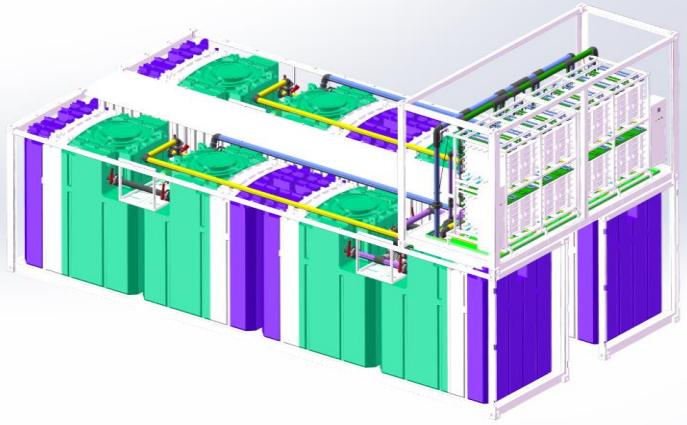
The system consists of one integrated container.
The integrated container includes the stack, electrical system, BMS, electrolyte tanks, circulation system and temperature control system.

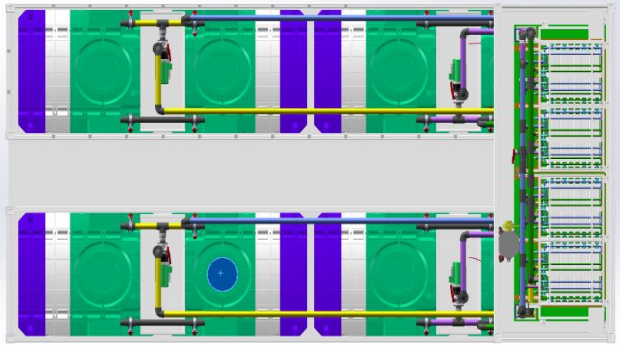
Model	50kW/200kWh
Rated Energy	200 kWh
Rated Power	50 kW
Input / Output	AC 380V; 50Hz
Depth of Discharge	100 %
Ambient Temperature	-15-60 ℃
Communication Interface	RS485/Ethernet
Communication Protocol	ModbusTCP
Footprint	6.5×2.5 m
Total Weight	About 28 T
Degree of Protection	IP54
System Composition	20ft Container

Advantages：

- **Long-duration electricity storage device**
- **All-in-one container integration system， quick installation**
- **Integrated online capacity recovery device**

Typical System Solution-- 500kW/2000kWh Solution

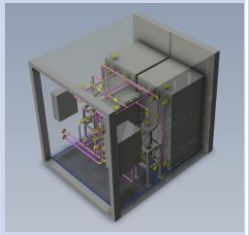
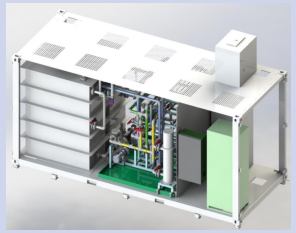
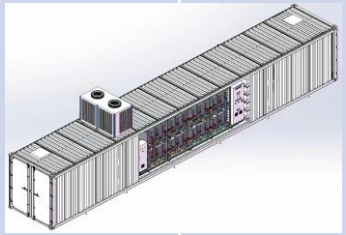
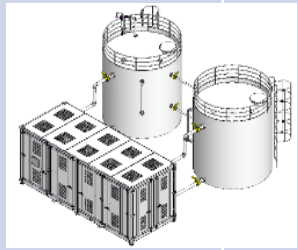
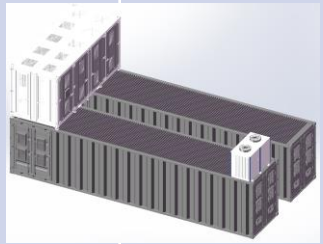




The system consists of one power container and two capacity containers.
Power container includes the stack group, electrical system and BMS.
Capacity container includes electrolyte tanks, circulation system and temperature control system.

Model		500kW/2000kWh
Rated Energy		2000 kWh
Rated power		500 kW
Input / Output		312 V ~ 499.2 V
Depth of discharge		100 %
Ambient temperature		-15-60 ℃
Communication Interface		RS485/Ethernet
Communication protocol		ModbusTCP
Footprint		15×9 m
Total weight		About 100 T
Degree of protection		IP54
System composition	Stack system	20ft Container
	Electrolyte	40ft Container * 2

Typical Products and Solutions

Product model	ESS-2.5	ESS-10	ESS-50	ESS-125	ESS-250	ESS-125	ESS-250	ESS-500
Schematic drawing								
Type	Cabinet	Container type				Split type		
Rated power (kW)	2.5	10	50	125	250	125	250	500
Energy storage duration (h)	1~4	2~6	2~8	1~4	1~2	> 4	> 4	> 4
AC voltage (V)	380/220		380					
DOD (%)	100							
Cycle life (times)	> 20000							
Response time (ms)	< 100							
Communication interface	Modbus RTU/Modus TCP							
Ambient temperature (℃)	-30℃~50℃							
Scenario	Household	Industry and commerce	Power generation side, Power grid side, Power user side					

Typical Application--Power Generation Side

Project Name	Qinghai 1MW/5MWh VRB energy storage project
Location	Qinghai, China
Environment	Desert, High altitude
Application scenario	Combined wind power station

Project Name	Yamanashi 100KW/380KWh microgrid project
Location	Yamanashi, Japan
Environment	Close to farmland
Application scenario	Combined solar power, DC-coupled

Project Name	Kyushu 125kW250kWh VRB energy storage project
Location	Kyushu, Japan
Environment	Near the sea
Application scenario	Combined wind power, Special design for independent charging and discharging

Typical Application--Power Grid Side

Project Name	Haiyang 1MW/2MWh VRB energy storage project
Location	Haiyang City, Shandong Province, China
Environment	Near the sea
Application scenario	Independent energy storage power station on the grid side

Project Name	Juancheng 1MW/2MWh VRB energy storage project
Location	Juancheng county, Shandong Province, China
Environment	Near the village
Application scenario	Independent energy storage power station on the grid side

Project Name	Dongying 1MW/2MWh VRB energy storage project
Location	Dongying City, Shandong Province, China
Environment	Close to industrial area
Application scenario	Independent energy storage power station on the grid side

Typical Application--Power User Side

Project Name	Shantou 1MW/1MWh VRB energy storage project
Location	Shantou City, Guangdong Province, China
Environment	Near the sea
Application scenario	Zero carbon industrial park, new energy electricity is 100% consumed locally

Project Name	Haili 1MW/4MWh VRB energy storage project
Location	Maanshan City, Anhui Province, China
Environment	Inside industrial park
Application scenario	Combined PV power generation, adopt split type solution, tanks external

Project Name	Namie 25kW/250kWh VRB energy storage project
Location	Namie, Fukushima, Japan
Environment	Inside industrial park
Application scenario	Off-grid PV&BESS, Independent charging and discharging long-duration system.

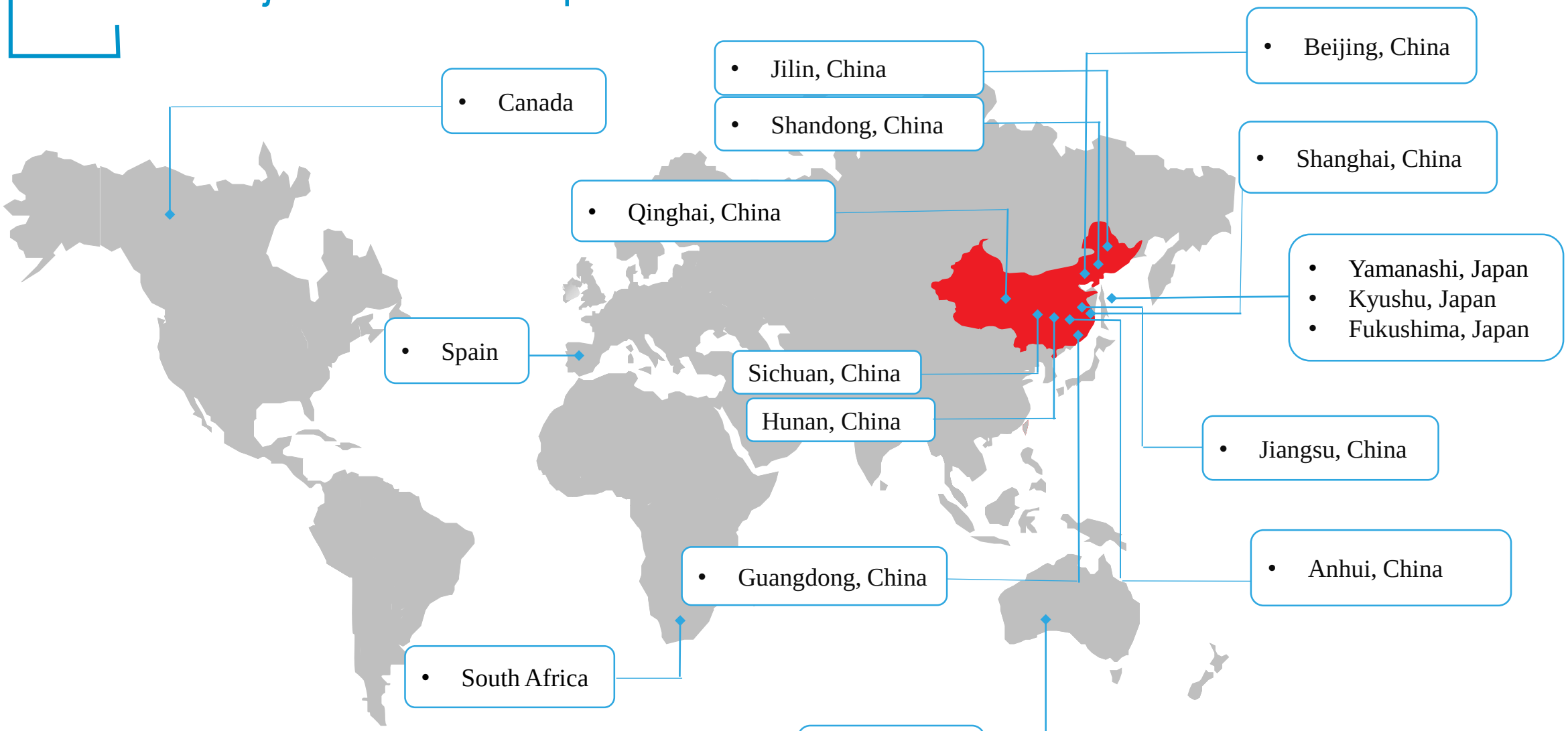
Typical Application--Large-scale projects

Project Name	Guanyun 10MW/20MWh VRB energy storage project
Location	Guanyun county, Jiangsu Province, China
Environment	Near the sea
Application scenario	Centralized on-grid energy storage power station

Project Name	Dengkou 50MW/200MWh VRB energy storage project
Location	Dengkou county, Inner Mongolia Province, China
Environment	Located in a desert area
Application scenario	Centralized on-grid energy storage power station

Project Name	Baicheng 100MW/600MWh VRB energy storage project
Location	Baicheng county, Jilin Province, China
Environment	Located in north China
Application scenario	Centralized on-grid energy storage power station

Global Project Location Map



More than 50 projects worldwide

上海电气
SHANGHAI ELECTRIC

THANK YOU

www.shanghai-electric.com