

ZOE
ENERGY STORAGE

ZOE ENERGY STORAGE

Dedicated to Being a Global Force in Transforming Energy Structures



ZOE signifies “life” in Greek

ZOE

Every life form in the universe represents a form of energy storage. The birth of life, and indeed miracles, emerge when energy comes into order. We witness each collision between life and the universe; faint yet overwhelmingly impactful, it symbolizes a coupling state of one form of energy with another.





ENERGY FOR LIFE

Resources + Life = Energy

Energy + Life = Civilization

Mankind will continue to create its own civilization



ZOE Energy Storage

ZOE Energy Storage, a pioneer in integrating investment, operation of energy storage plants, and the R&D, manufacturing, and sales of energy storage systems, has its global headquarters and cutting-edge digital energy center in Shanghai, complemented by an R&D center in Jiangsu. In partnership with leading universities and research institutions, ZOE has established joint laboratories to advance the development and application of energy storage technology. With advanced manufacturing facilities totaling 14GWh in Jiangxi and Sichuan, ZOE delivers both standardized and tailored energy storage solutions, seamlessly integrating into diverse application scenarios, and ensuring efficient and balanced power distribution across various electrical demands.

As a subsidiary of the ZOE Energy Group, ZOE Energy Storage contributes to the group's overarching mission. Founded in 2013, ZOE Energy Group is a high-tech enterprise dedicated to the development, investment, and management of new energy projects. Embracing the zero-carbon initiative, the Group has developed 21 utility-scale solar projects with a combined capacity of 3.22GW and is progressing with wind, photovoltaic, and shared energy storage projects of 1.54GW and 3.2GWh, respectively. With a cumulative investment exceeding \$3.6 billion, the Group has realized an impressive annual compound growth rate of 183%, underscoring its commitment to sustainable energy development.

Dedicated to Being a Global Force in Transforming Energy Structures



Core Business

ENERGY STORAGE PLANTS
Investment and operation

ENERGY STORAGE SYSTEM
R&D, Manufacturing, Sales



Our Service

Service Area
Europe, China, Online Services

Technical Support
O&M Analysis, After-Sales Service



R&D Innovation

Establish joint laboratories with universities and research institutions to advance the development and application of energy storage technology



Digital Energy

- Full Lifecycle Management of Energy Storage Projects and Assets
- Cloud-Edge-End Integrated Platform for Energy Storage Management
- Aggregating multiple types of energy to implement a variety of digital energy solutions



Manufacturing

14GWh Intelligent Energy Storage Factory

Milestone

Inception >

2013

ZOE Energy Group established.

2014

Established operational photovoltaic module factory, with annual capacity of 500MW.

Expansion >

2015

Initiated global strategy, invested in overseas markets.

2016

Launched the "ZOE Future Home" sub-brand, pioneering into the distributed photovoltaic market with over 2000 residential photovoltaic project investments.
Honored with the Gold Award in the Chinese residential photovoltaic market.

2017

Ranked top five in Chinese photovoltaic module shipments to Australia.

2018

Venturing into new energy vehicle industry, invested in aftermarket service platforms.

Thriving >

2019

Secured a 240MW photovoltaic bidding project, the largest single project in the China Southern Power Grid and Guizhou Province.

2020

Focused on domestic market, secured a 350MW national photovoltaic bidding project, ranked first among private enterprises in Guizhou Province.

2021

Secured new energy projects with a total installed capacity of 1.92GW, including 7 photovoltaic and 2 wind power projects, leading nationally.

New Chapter >

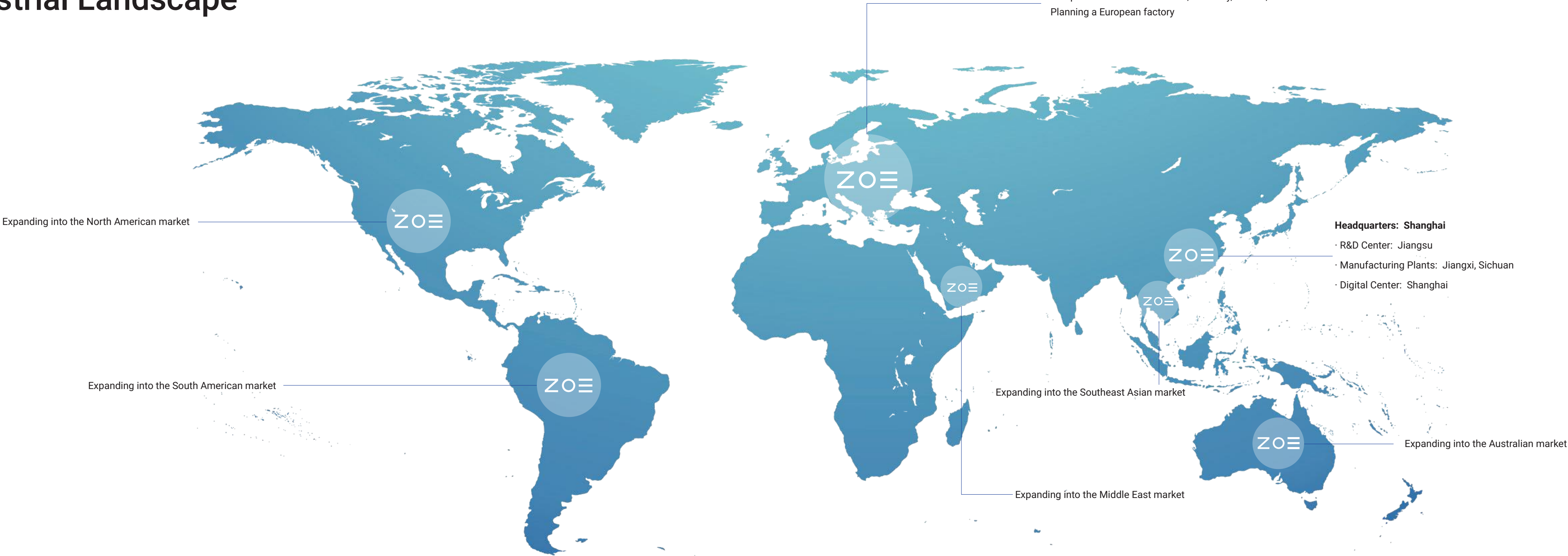
2022

· Shanghai ZOE Energy Storage Technology Co., Ltd. established
· Established the R&D center, successfully developed liquid cooling battery energy storage system
· Established the ZOE Digital Energy Center.
· Planned Jiangxi energy storage factory

2023

· Launched Z BOX liquid cooling battery energy storage system, obtained CGC and CE certification
· The R&D center obtained the "TÜV Rheinland Witnessed Test Lab" qualification
· Launched 2GWh energy storage factory in Jiangxi and planned 12GWh factories in Sichuan
· Intensified efforts in expanding global market

Industrial Landscape



R&D Innovation



ZOE's R&D Center, featuring advanced Power Electronics, Photovoltaic-Storage-Charging Integration, Energy Storage System Integration, and PCS Laboratories, has earned the prestigious Witness Laboratory qualification from TÜV Rheinland and TÜV Nord. In collaboration with esteemed institutions like the Chinese Academy of Sciences, Zhejiang University, and Chengdu University of Electronic Science and Technology, we are at the forefront of developing and applying cutting-edge energy storage technologies.



TMP Witness Laboratory qualification
by TÜV Rheinland of Germany



Witness Laboratory qualification
by TÜV NORD

No.	Name of invention	Patent application number	TYPE
01	AC Charging Multi-terminal Intelligent Control System and Method	2022113885385	Invent
02	DC Charging Multi-terminal Intelligent Control System and Method	2022113885347	Invent
03	AC-Coupled Photovoltaic Storage Charging System	2022113885366	Invent
04	Testing Method for Verifying Communication Anomalies Using PMA Tools	202211388539X	Invent
05	Low Power Consumption Power Circuit in BMS Management System	2023100774336	Invent
06	Low Power Consumption Power Circuit in BMS Management System	202320147425X	Practical
07	Outdoor Cabinet Light Panel Display Circuit	2023201392226	Practical
08	EMS Control Technology Developed through Real-Time Secondary Development Based on Interpretive Command Scripts	2022114888624	Practical
09	New Testing Methods for Monitoring and Debugging	2023101135166	Invent
10	Methods in EMS Management System to Counter Common DOS Attacks	2023100613974	Invent
11	Liquid Cooling Pipe Transition Structure for Energy Storage PACK	2023206128380	Practical
12	Outdoor Liquid-Cooled Cabinet Firefighting System Device	2023106684884	Invent
13	Triaxial Piezoelectric Accelerometer-Based Cell Fault Diagnostic Device	2023214358223	Practical
14	Cell Fault Diagnostic Method Based on Acoustic Pattern Sensors	2023214630379	Practical
15	Fire Early Warning Device Based on Gas Sensor Data Collection	2023106688071	Invent
16	Cell Fault Diagnostic Device Based on Multidimensional Information Fusion	2023214630434	Practical
17		2023214630504	Practical

Manufacturing

14GWh Intelligent Energy Storage Factory



PACK



ESS integration

The company operates advanced energy storage factories with a total capacity of 14GWh in Jiangxi and Sichuan, China. These facilities include automated PACK, PCS, and system integration lines. Equipped with cutting-edge technology and comprehensive testing capabilities, these factories employ a MES system to collect production, material, process, quality, and other relevant information. This enhances automation, intelligence, and flexibility in production, ensuring the highest standards of safety and quality in our products.

Digital Energy

EaaS Energy as a Service

ZOE's EaaS (Energy as a Service) presents a cutting-edge digital energy service platform tailored for commercial and industrial clients. Our comprehensive suite includes an energy storage software, an EMS cloud platform, and a variety of digital energy solutions. Designed to enhance power plant productivity, reduce energy consumption, and boost economic returns for businesses, ZOE's EaaS is your partner in efficient and sustainable energy management.

COMPLETE

Wind Speed ;
Voltage :
Current ;
Capacity :

Wind Turbine
Wind Generator

WARNING !



Full Lifecycle Management of Energy Storage Projects and Assets

This includes project design, economics evaluation, and project management.

Cloud-Edge-End Integrated Platform for Energy Storage Management

Utilizing Internet of Things (IoT) and Big Data technologies, we provide a unified platform for efficient energy management in energy storage plants.

Digital Energy Solutions on ZOE's Digital Foundation

Leveraging ZOE's robust digital infrastructure, our platform aggregates multiple types of energy, offering a variety of digital energy solutions.



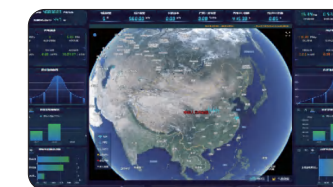
Business Automation System

- Full Lifecycle Project Management
- Energy Storage Economic Evaluation
- New Energy Resource Evaluation
- Project Feasibility Analysis
- Supplier and Customer Management



EMS Cloud Platform

- IoT (Internet of Things) Platform
- Full Lifecycle Data Management
- Battery Health Monitoring & Analysis
- Smart Operation and Maintenance of Power Plants
- Enhancement of Economic Benefits of Power Plants



Digital Energy Solutions

- Cloud Computing + Big Data + AI Model for Distributed Energy Aggregation
- Virtual Power Plant Platform
- Multi-Scenario Solutions for Industrial and Commercial Energy Storage
- Integrated Energy/Low-Carbon Parks/Digital Twin



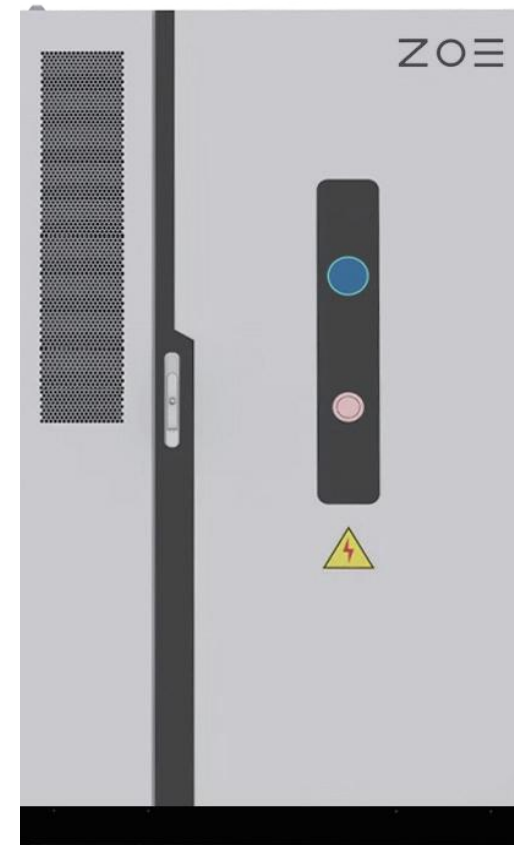
ZOE

COMMERCIAL AND INDUSTRIAL ESS

ENERGY FOR LIFE

Z BOX

ZOE Battery Energy Storage System - Liquid Cooling



Z BOX-H
372kWh



Z PCS
200kW



Z BOX-C
105kW / 215kWh

Qualification Certification

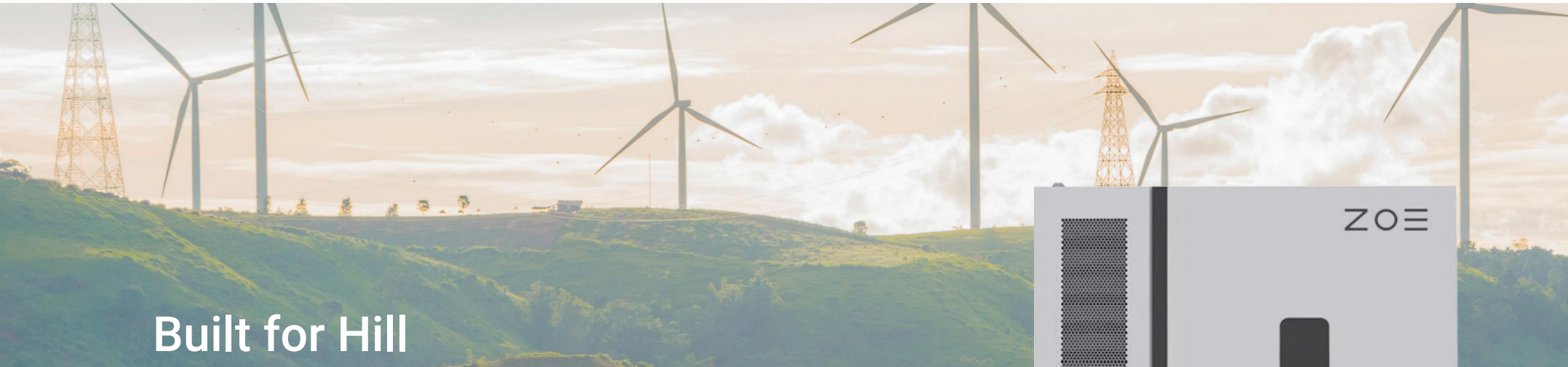


Our products have achieved international certifications for safety, quality, and market access, meeting stringent global standards for safety, compatibility, and performance.

- CE certified, adhering to Europe's LVD and EMC standards for electrical safety and electromagnetic interference
- Certified for EU grid connection under EN 50549-1, recognized in Sweden, Poland, Spain, and Italy for seamless local grid integration
- Achieving certifications like CGC and CQC, meeting rigorous quality control and product consistency standards throughout production



Commercial and Industrial Products



Safe & Reliable

- Safely Separated Cabinet Layout for Physical Isolation
- Equipped with Safety Management System (SMS) for multiple safety protections
- Uses CATL's high-quality, safe, and efficient LFP cells
- Full lifecycle management



Economical & Efficient

- Rapid power response, supporting various modes like virtual power plants, on-grid, off-grid, etc
- Intelligent balancing strategy to ensure battery lifecycle consistency
- Dynamic switching of energy regulation strategies



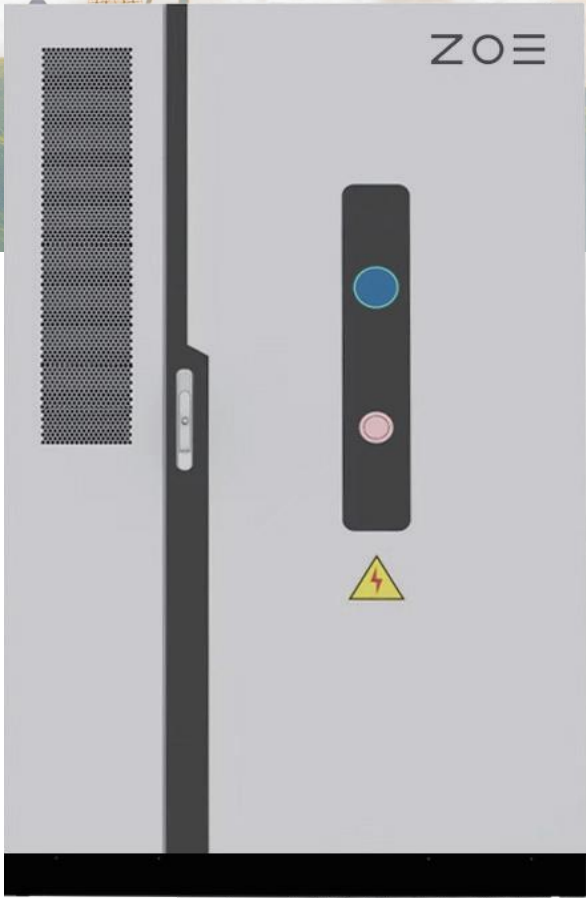
Flexible Deployment

- Structured design, easy to expand
- Supports centralized, decentralized deployment, and integration with photovoltaic storage and charging



Data Management

- Cloud-Edge-End collaboration with 24/7 performance monitoring for safe and stable operation
- Cloud-based big data and intelligent algorithms for flexible system strategy adjustment



Z BOX-H

Battery Energy Storage System (Liquid Cooling)

C372L-D-EU 372kWh | 0.5C

Battery data	
Cell type	LFP
Rated capacity	280 Ah
Serial-parallel type	1P416S
Rated capacity per pack	46.592 kWh
Pack number	8
System rated energy capacity	372.736 kWh
DC rated voltage	1331.2 V
DC voltage range	1164.8~1497.6 V
Rated DC current	140 A
Max. DC current	160 A

General data	
DOD	95%
Degree of protection	IP55 （Battery room ）
Cooling concept	Liquid cooling
Heating concept	Liquid heating
Fire suppression system	aerosol
Operating temperature range	-20~55 °C
Relative humidity	5%~95% RH
Max.working altitude	2000 m
Display	APP/ Web/ LED
COM interfaces	RS485/ Ethernet
Dimensions(W*D*H)	1370*1330*2270 mm
Weight	3550±50 kg

Commercial and Industrial Products



Built for City



Safe & Reliable

- Safely Separated Cabinet Layout for Physical Isolation
- Equipped with Safety Management System (SMS) for multiple safety protections
- Uses CATL's high-quality, safe, and efficient LFP cells
- Full lifecycle management



Economical & Efficient

- Rapid power response, supporting various modes like virtual power plants, on-grid, off-grid, etc
- Intelligent balancing strategy to ensure battery lifecycle consistency
- Dynamic switching of energy regulation strategies



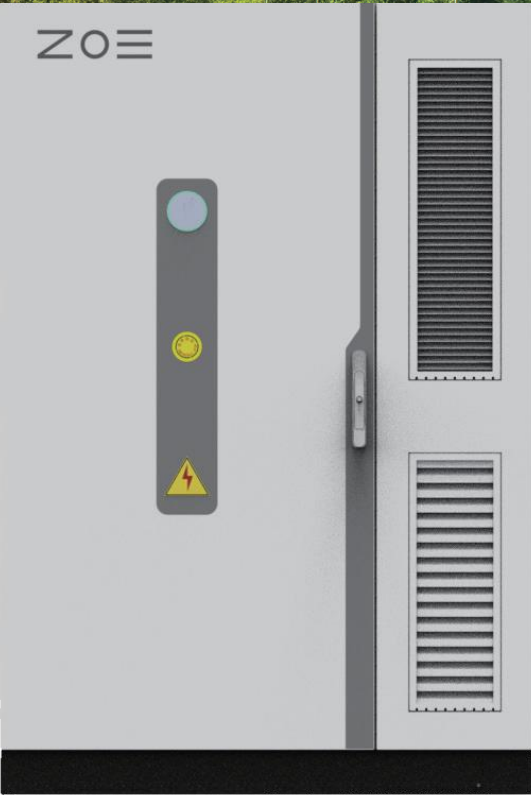
Flexible Deployment

- Structured design, easy to expand
- Supports centralized, decentralized deployment, and integration with photovoltaic storage and charging



Data Management

- Cloud-Edge-End collaboration with 24/7 performance monitoring for safe and stable operation
- Cloud-based big data and intelligent algorithms for flexible system strategy adjustment



Z BOX-C

Battery Energy Storage System (Liquid Cooling)

C215L-A-EU 105kW / 215kWh | 0.5C

Battery data	
Cell type	LFP
Rated capacity	280 Ah
Serial-parallel type	1P240S
Rated capacity per pack	43.008 kWh
Pack number	5
System rated energy capacity	215.04 kWh
DC rated voltage	768 V
DC voltage range	672~864 V
Rated DC current	140 A
Max. DC current	160 A

AC Data	
Rated AC power	105 kW
Rated grid voltage	400 Vac
Rated grid frequency	50/60 Hz
Max. AC current	167 A
AC wiring type	3W/N+PE
Power factor	-1~+1

General data	
DOD	95%
Degree of protection	IP55 （Battery room & PCS room）
Cooling/Heating concept	liquid cooling/ liquid heating
Fire suppression system	aerosol
Operating temperature range	-20~55 °C
Relative humidity	5%~95% RH
Max.working altitude	2000 m
Display	APP/ Web/ LED
COM interfaces	RS485/ Ethernet/ 4G (optional)
Dimensions(W*D*H)	1399*1344*2080 mm
Weight	2450±50 kg

Commercial and Industrial Products

Z PCS
Power Conversion System



ZOE-ECS100-LA-A 100kW Built-in

General data	
Max. efficiency	≥99%
Isolation Transformer	无
Protection Level	IP65
Operating Temperature	-30~60°C (>40°C Derating)
Relative Humidity	0~100%
Cooling Method	Smart Cool Air
Maximum Operating Altitude	4000m (>3000m Derating)
Communication Protocol	Modbus-RTU/Modbus-TCP/IEC61850/CAN
Dimensions (W*D*H)	600*480*221mm
Weight	60kg
Standard	GB/T 34120-2017 GB/T 34133-2017 IEEE 1547 IEC 62477-1 IEC 61000-6-2 IEC 61000-6-4

DC Side Parameters	
Maximum DC Voltage	1000Vdc
DC Operating Voltage Range	600~1000Vdc
Maximum DC Current	183A
Full Load DC Voltage Range	600~850Vdc

AC Side Parameters	
Rated Output Power	100kW
Maximum Output Power	110kVA
Rated Grid Voltage	400Vac
Rated Grid Frequency	50Hz/60Hz
Maximum Output Current	158A
Power Factor	-0.99~+0.99
THDi	<3%
Charge/Discharge Conversion Time	<100ms
On/Off Grid Switching Time	≤20ms
Unbalanced Load Capacity	100%

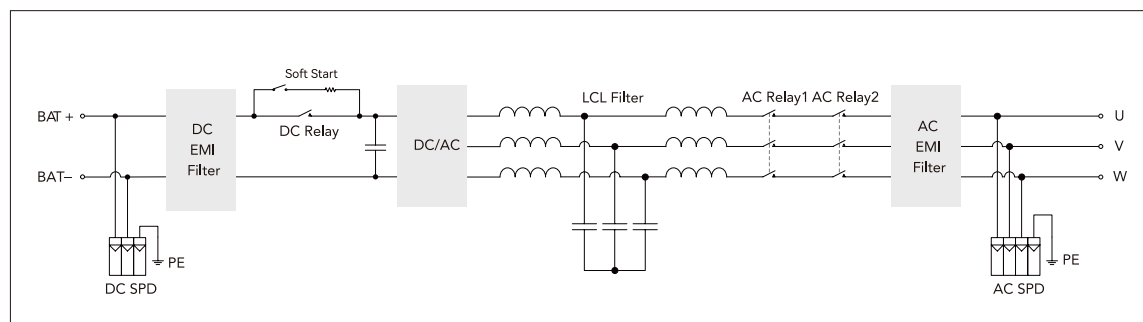
Commercial and Industrial Products

Features

- Charge/discharge each cluster independently
- Fast plug and play, easy expansion
- C5M anti-corrosion grade
- Parallel in AC side (maximum 40 sets)
- Grid-forming/black start capability
- Safe and reliable
- Modular design philosophy
- No need advanced technical service personnel
- Horizontal and vertical mounting thermal design
- Higher battery capacity utilization



Circuit diagram



ZOE-ECS200-HB-A 200kW

Input -DC	
Max. DC voltage	1500 Vdc
Startup voltage	1000 Vdc
Max. input current	224.5 A
Full-load voltage range	1000~1500 Vdc

Output -AC (on-grid)

AC output power	220kVA@35 °C , 200kVA@45 °C
Rated output voltage	690Vac, 3W+PE
AC voltage range	607~759 Vac (Adjustable)
Rated frequency	50/60 Hz
Rated (Max.) output current	167.4 A (184.1 A)
Power factor	-1~+1
THDi	<1.5% (100% load)

Output -AC (off-grid)

Rated output voltage	690Vac, 3W+PE
AC voltage range	607~759 Vac (Adjustable)
Rated frequency	50/60 Hz
AC voltage distortion	<1.5% (100% linear load)
DC voltage component	<0.5% Un (Linear balance load)
Unbalanced load capacity	100%



General data

Max. efficiency	99%
European efficiency	98.5%
Isolation mode	transformerless
Protection degree	IP66
Operating temperature range	-40~+60°C (>45°C derating)
Relative humidity	0-100%, non-condensing
Cooling	Smart air cooling
Max.working altitude	4000m (>3000m derating)
Communication interfaces	RS485/CAN/Ethernet
Dimensions (W × D × H)	810*275*845mm
Weight	98
Certification	GB/T 34120-2017
	GB/T 34133-2017
	IEC 62477-1
	IEC 61000-6-2
	IEC 61000-6-4
	EN 50549-1
	EN 50549-2

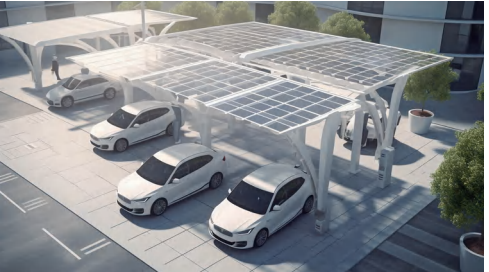
Application Scenario



Generation/Grid Side Energy Storage Solutions

In the global shift towards sustainable energy, generation/grid side storage solutions are crucial. By digitally managing energy generation, storage, and distribution, we enhance power system stability, reliability, and efficiency. Our focus is on promoting clean energy on a large scale, meeting the demands for environmental sustainability.

- **Scenarios:** Renewable energy, large thermal power stations, hydropower stations, shared energy storage stations
- **Demands:** Peak shaving, frequency regulation and smoothing renewable energy fluctuations



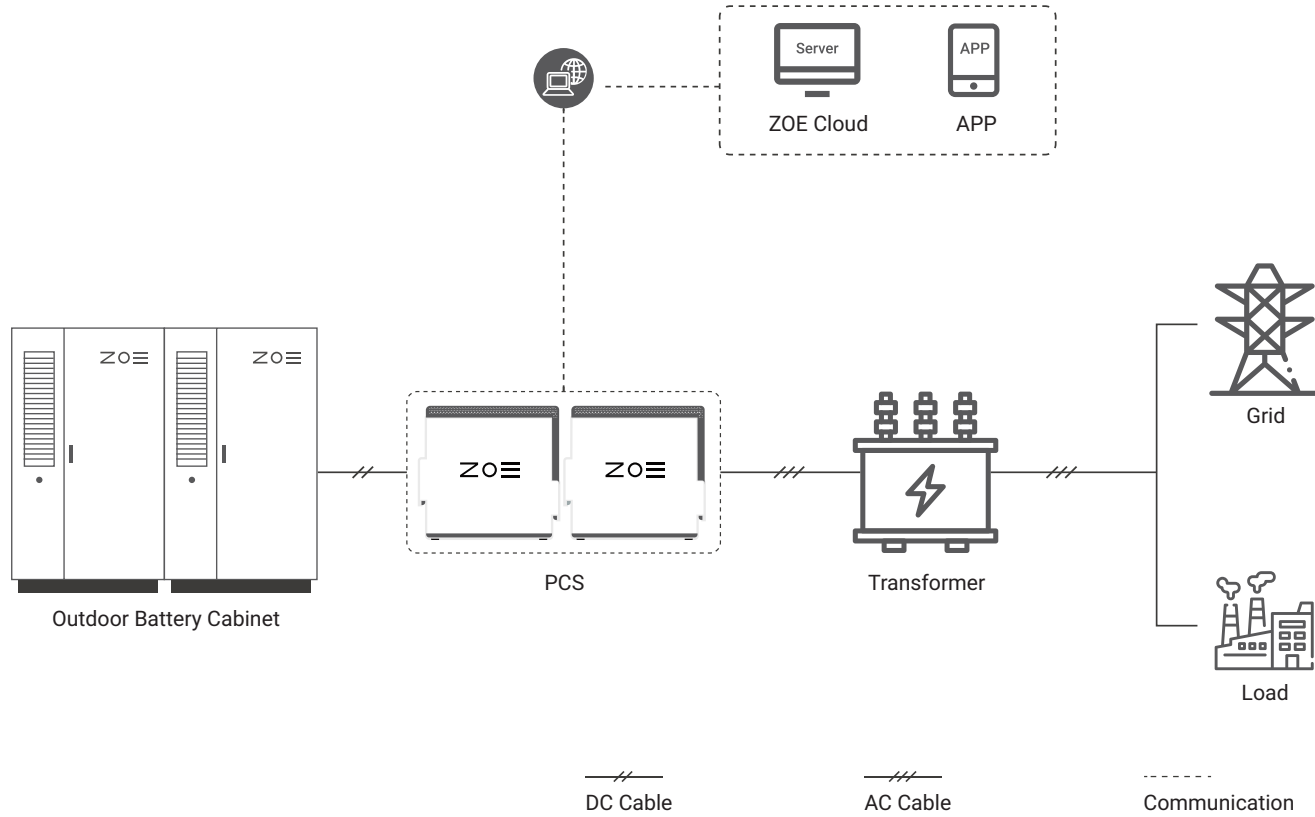
Commercial & Industrial Energy Storage Solutions

Offering tailored energy storage solutions for commercial and industrial demands, our modular design flexibly fits diverse settings, enhancing investment return. Focused on peak and valley power management, these solutions facilitate peak shifting and load leveling, reducing grid stress and electricity costs. Ideal for sectors needing reliable power, like data centers, medical facilities, and production lines.

- **Scenarios:** Full electrification, industrial parks, ports, office buildings, data centers, PV-storage-charging, etc
- **Demands:** Power rationing, high peak rates, demand charges, capacity shortages, costly transformer upgrades, spatial constraints, ESG compliance

Solution #1

On/Off Grid (C&I, Utility)

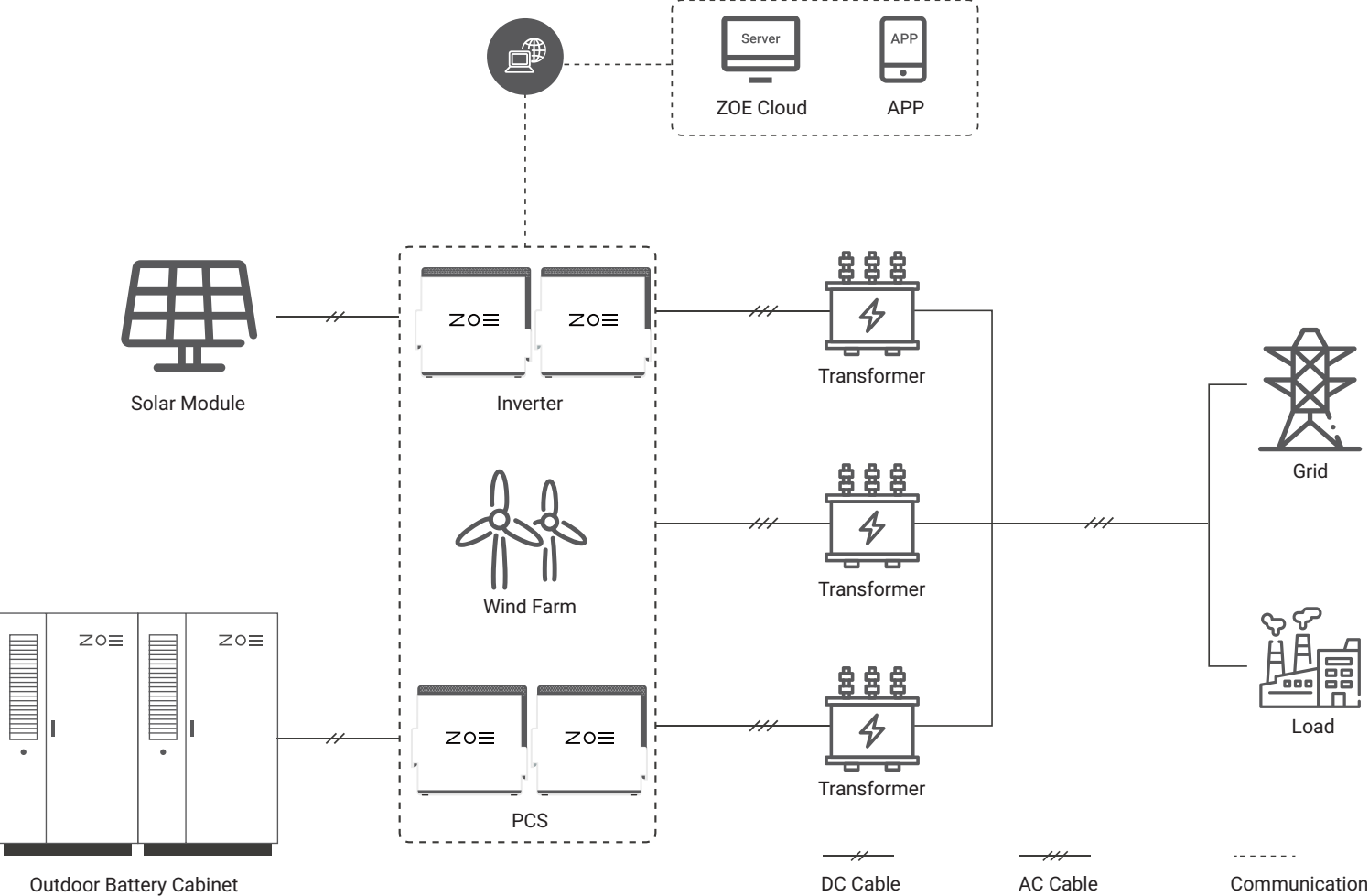


On/Off Grid (C&I, Utility)

- Frequency regulation
- Peak shaving
- Peak & valley arbitrage
- Back-up power
- Electricity trading on spot market

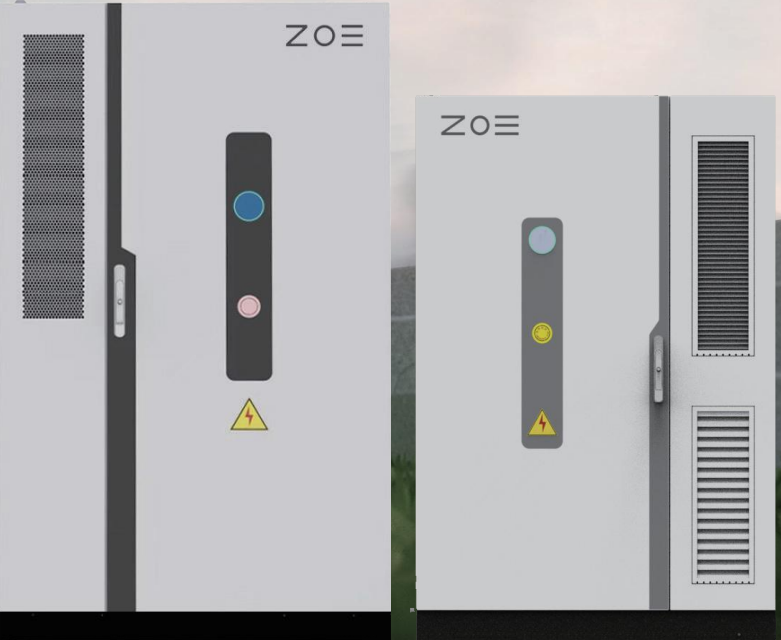
Solution #2

Renewable Energy with Storage



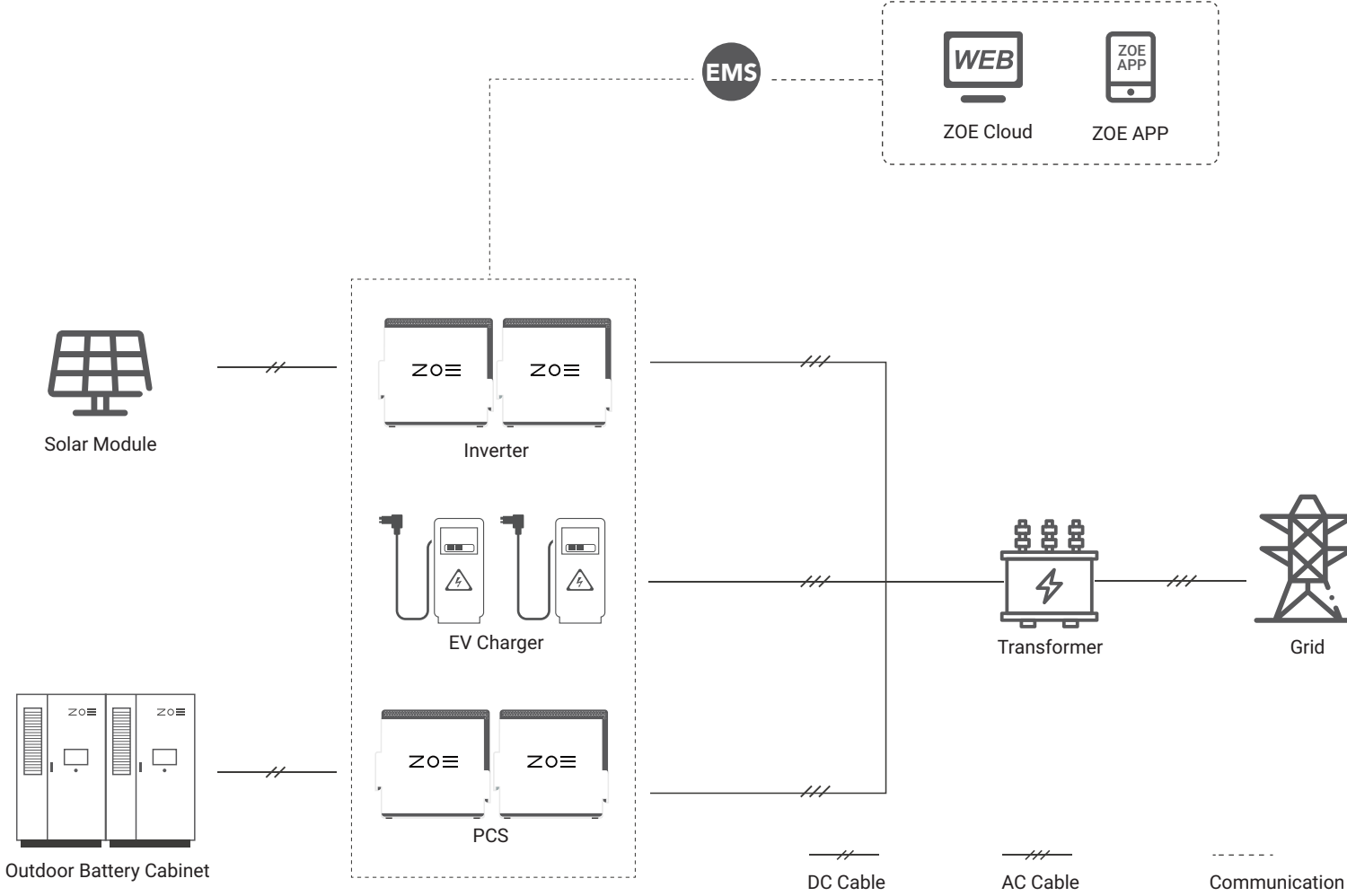
Renewable Energy with Storage

- Energy shifting
- Peak & valley arbitrage
- Renewable energy generation and storage



Solution #3

Photovoltaic Energy Storage and Charging

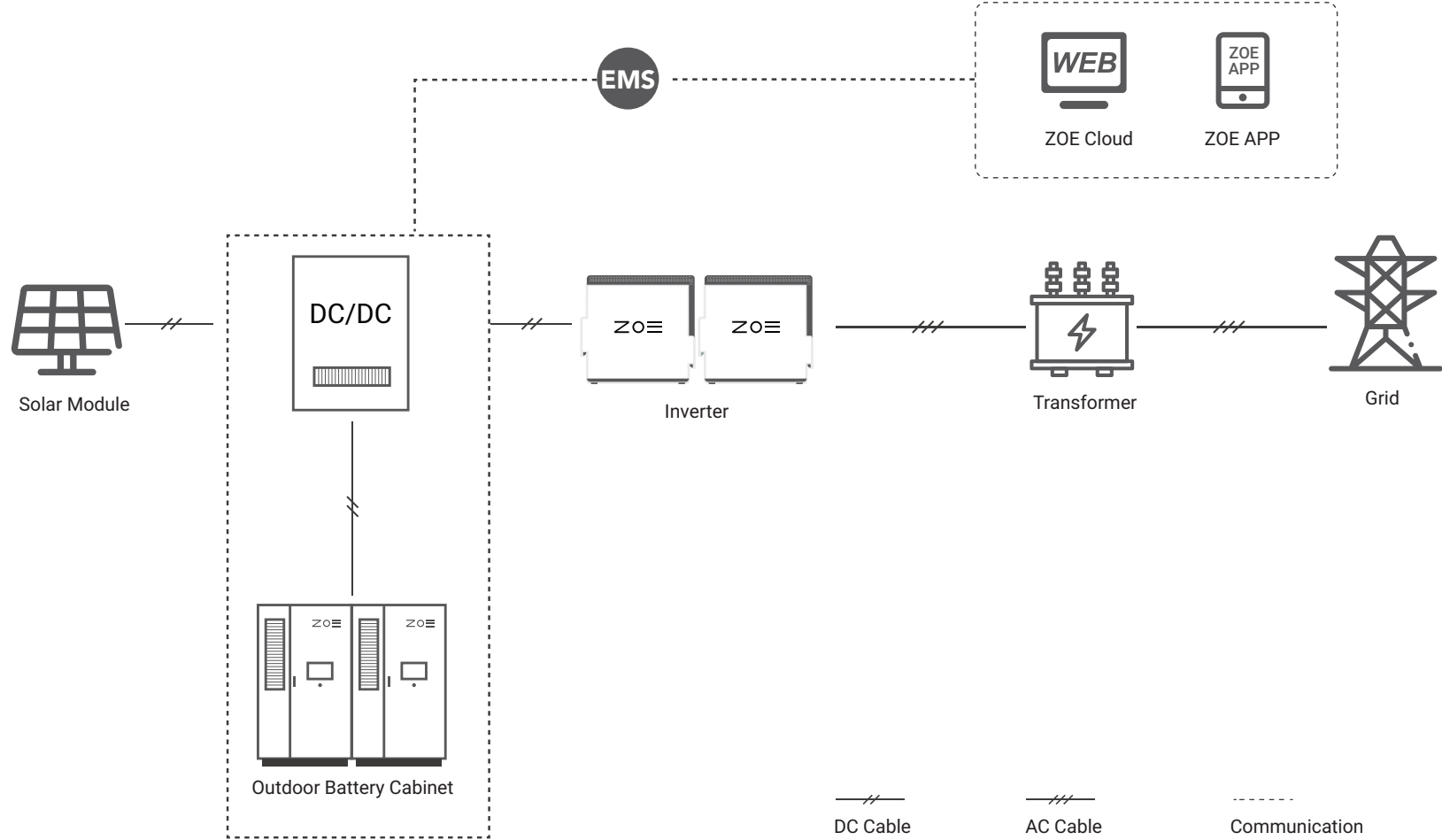


Photovoltaic Energy Storage and Charging

- Energy shifting
- Frequency regulation
- Renewable energy generation and storage

Solution #4

DC Coupling



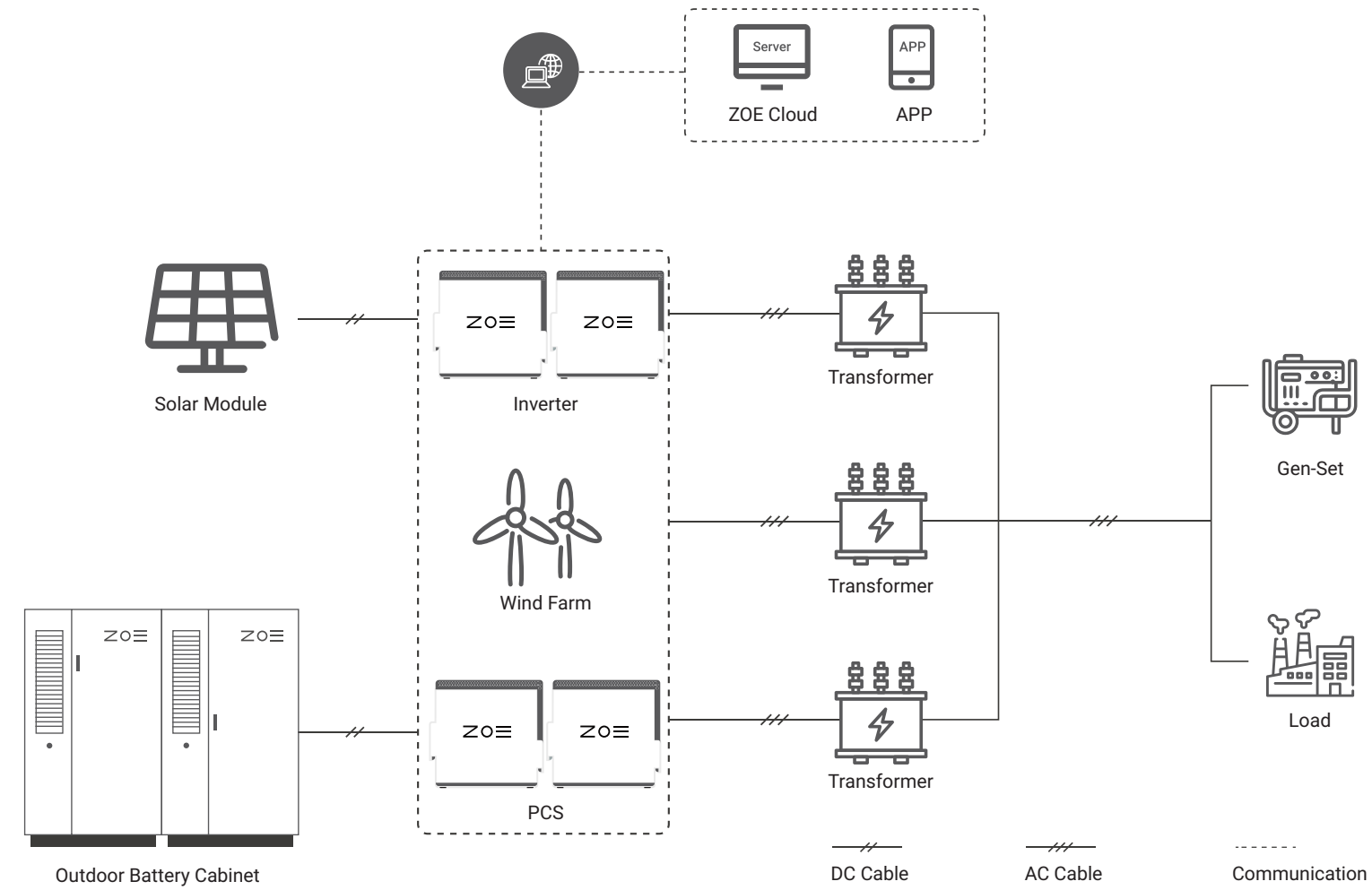
DC Coupling

- Peak shaving
- Enhancing energy efficiency
- Costs-efficiency
- Simplifying system structure



Solution #5

Micro-grid



Micro-grid

- Energy shifting
- Back-up power
- Less use of diesel genset
- Renewable energy generation and storage

Generation/Grid Side Renewable Energy with Storage

 Jiangxi, China



27MW/27MWh Xishan Energy Storage Power Station Project



Scenario Requirements		Configuration		
Project Date		Product	Z BOX-H	PCS
Location		Specification	1C	3150kW
System Capacity		Quantity	72	9
Application		Peak shaving, Frequency regulation		

Commercial and Industrial Renewable Energy with Storage

 Zhejiang, China



11MW/22MWh Hongfeng Photovoltaic Energy Storage Project



Scenario Requirements		24/7 uninterrupted high-energy usage			Configuration	
Project Date		2023			Product	Z BOX-H PCS
Location		Zhejiang, China			Specification	0.5C 200kW
System Capacity		11MW/22MWh			Quantity	60 60
Application		Peak shaving, Back-up power				

Renewable Energy with Storage in High-Altitude Areas

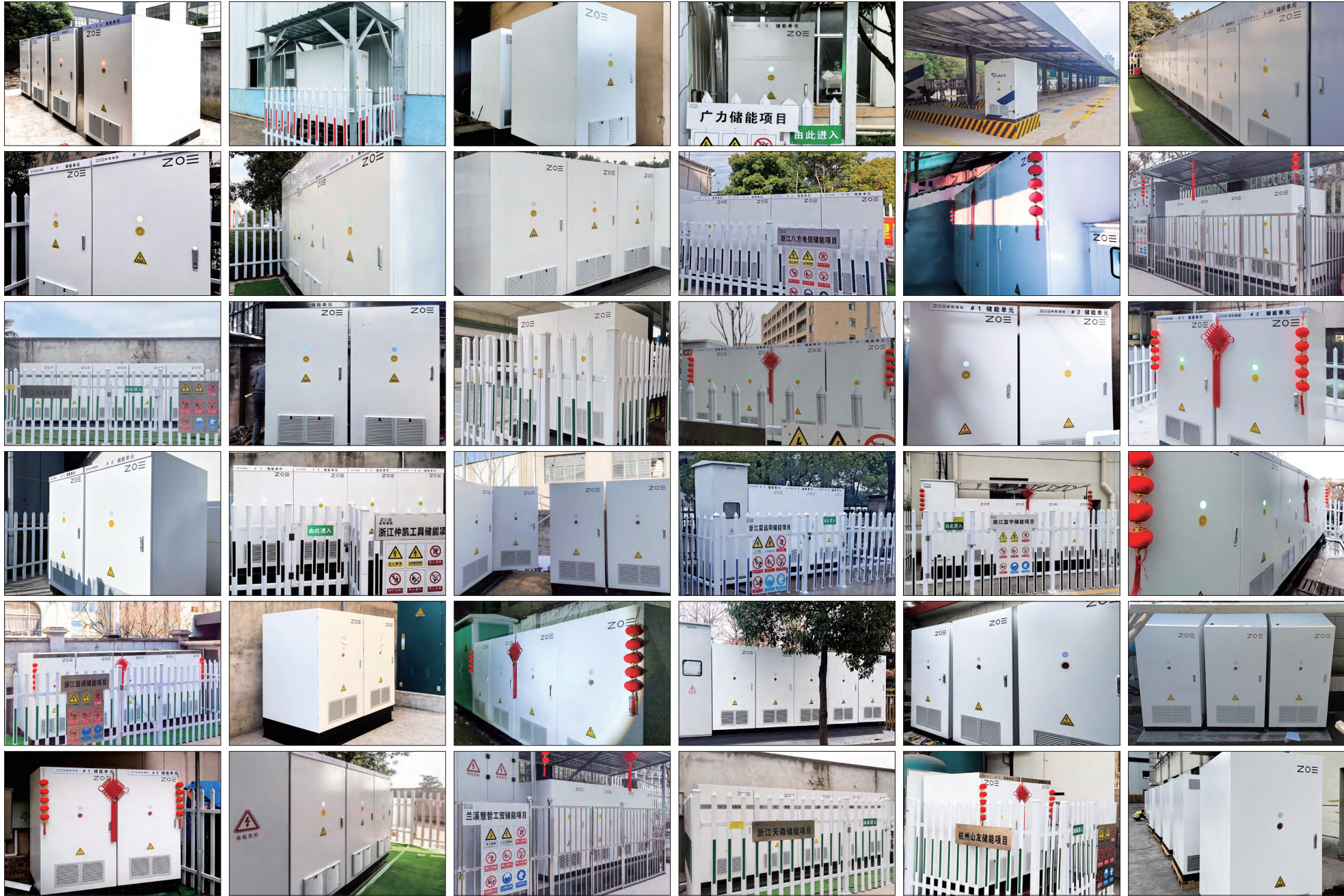
 The Tibetan Plateau, China



Highland Energy Storage Test Station Project



Scenario Requirements	Renewable energy storage in low-temperature environments at high altitudes	Configuration		
		Product	Z BOX-H/C	PCS
Location	The Tibetan Plateau, China	Specification	0.5C	200kW/100kW
Application	Maximizing renewable energy use, preventing wind and solar waste			



Commercial and Industrial Energy Storage

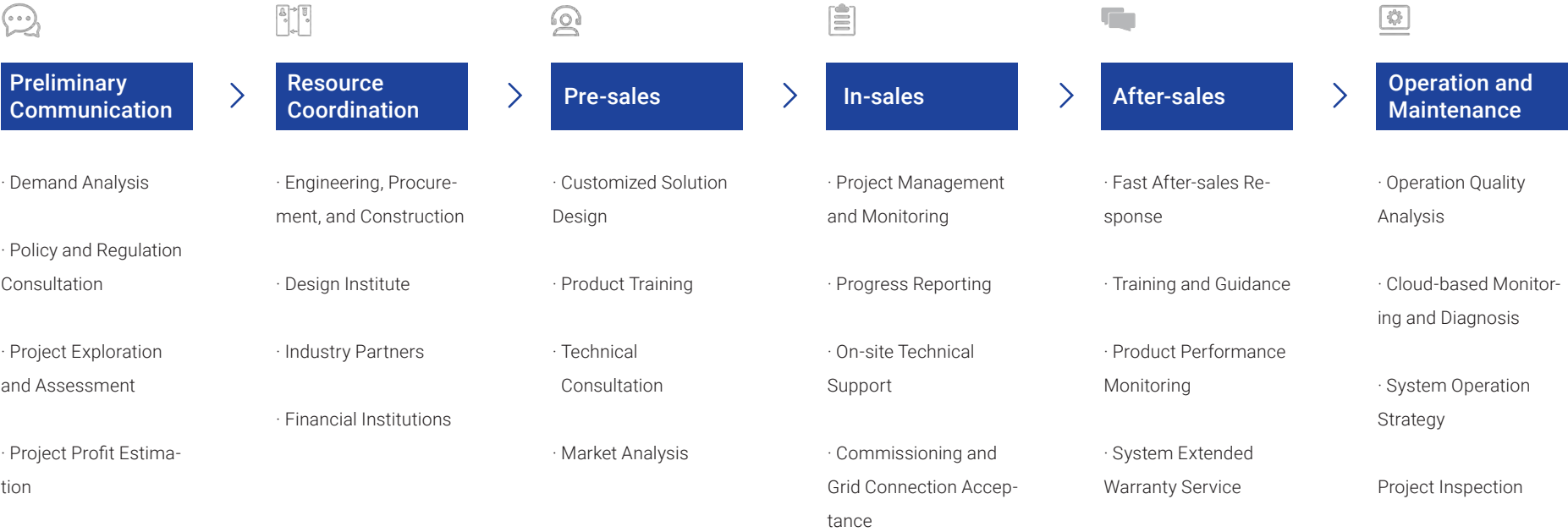


Z BOX-H Z BOX-C

Scenario Requirements	Energy saving, Demand reduction					
Project Date	2023					
Application	Peak & valley arbitrage, Demand management					
Regional Project Information	Jiaxing, China	1.674MWh	Huzhou, China	5.766MWh	Ya 'an, China	0.186MWh
	Longquan, China	0.744MWh	Wenzhou, China	24.552MWh	Guangde, China	2.976MWh
	Quzhou, China	5.208MWh	Ningbo, China	0.93MWh	Yiwu, China	6.138MWh
	Jinhua, China	4.278MWh	Zhangjiagang, China	19.344MWh	Taizhou, China	2.976MWh
	Hangzhou, China	8.184MWh	Jiyuan, China	2.232MWh	Lanxi, China	1.86MWh
	Shaoxing, China	1.116MWh	Jiaozuo, China	2.046MWh	Suqian, China	4.092MWh

Full Life Cycle Service System

We have established an efficient and comprehensive project management system. With a deep understanding of customer needs, we offer solutions that encompass the entire project lifecycle.



BUSINESS COOPERATION

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