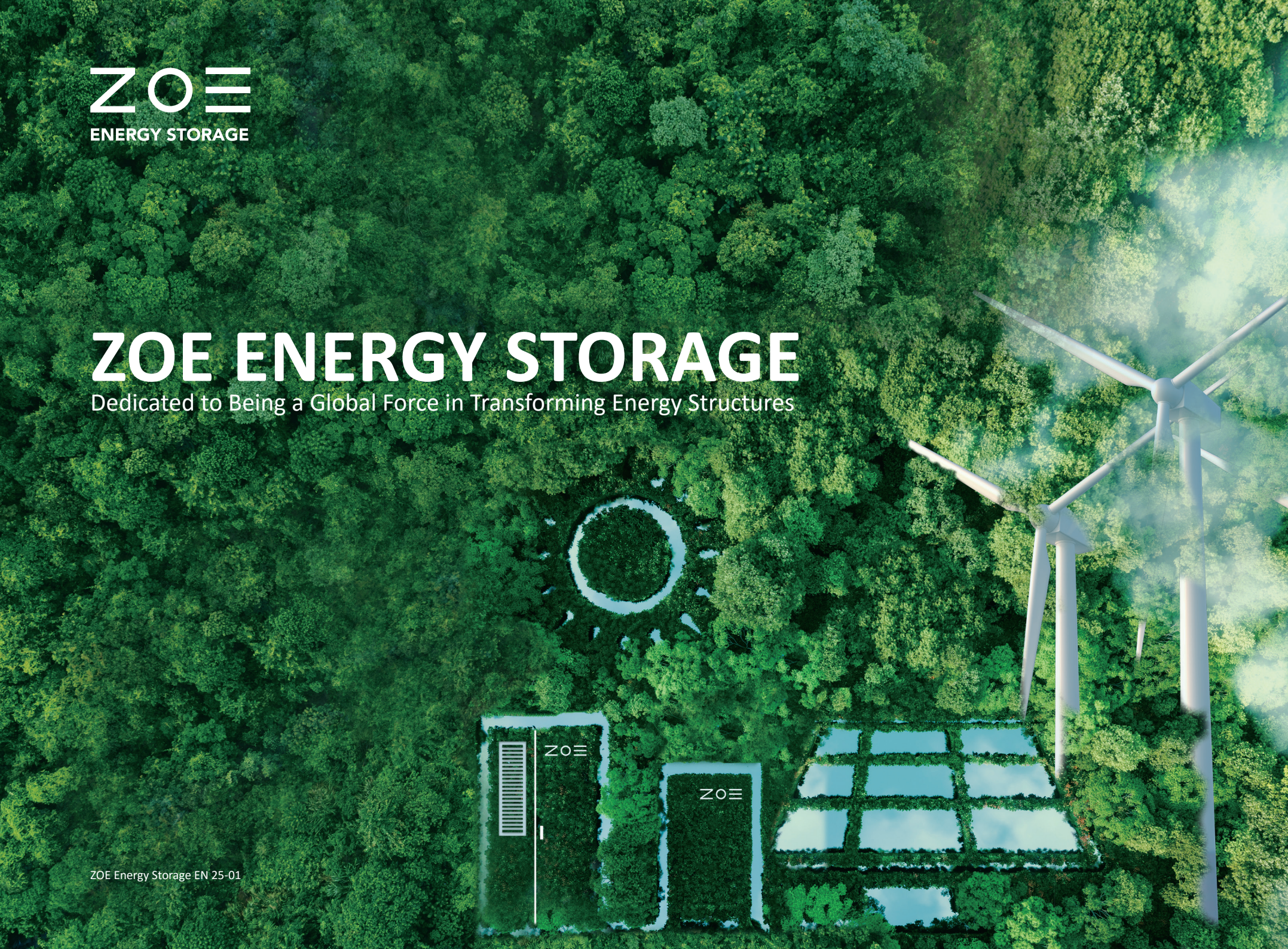
ZOE
ENERGY STORAGE

ZOE ENERGY STORAGE

Dedicated to Being a Global Force in Transforming Energy Structures



ZOE Energy Storage EN 25-01

ZOE Energy Group

ZOE Energy Group, established in 2013, is committed to driving the transformation of the global energy structure. Recognized as one of China's Top 500 Energy Enterprises, the Group operates across three business segments:

Renewable Power Generation

With a total capacity exceeding 6GW, backed by over USD 4.1 billion in investments.

Energy Storage Systems

As a Tier 1 global energy storage manufacturer, delivering integrated equipment and solutions.

Digital Energy Solutions

Operating one of the largest and most reliable direct-dispatch virtual power plants in its region, aggregating 300MWh of generation-side capacity and 200MWh of load-side capacity.

ZOE Energy Storage

TIER 1
BloombergNEF
Energy Storage Manufacturer

Tier 1 Global Energy Storage Manufacturer

- Energy storage equipment integration
- Energy storage system solution

R&D Innovation

- 100 Core Patents
- Focus on Safety and Stability in Energy Storage Systems

Manufacturing

- 4GWh Production Capacity
- Pack+PCS+System Integration line

High-quality Service

- Service Areas in Europe, China, and Online Support
- Providing O&M Analysis and Comprehensive After-Sales Service

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 projects.
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 200MW 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

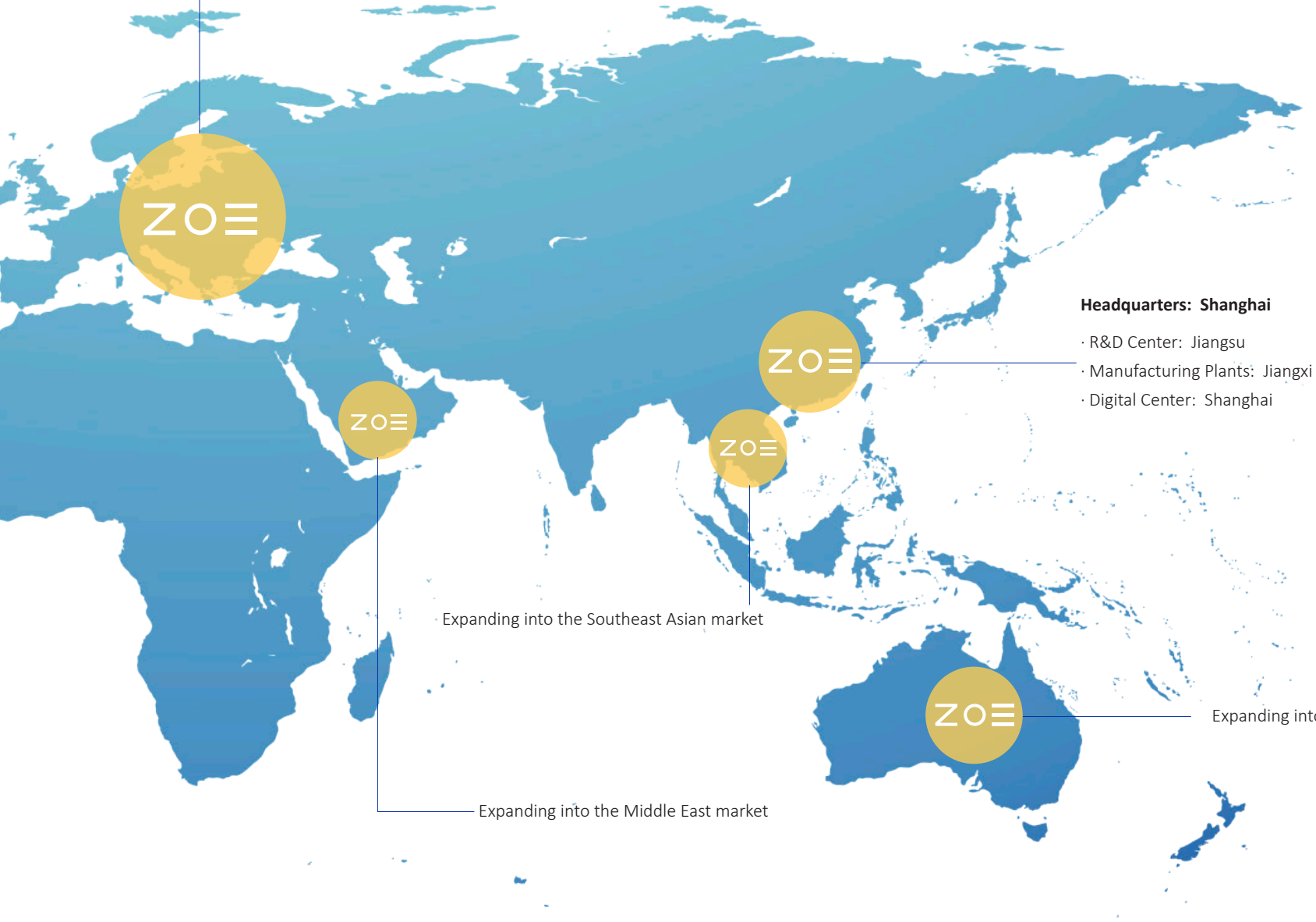
2023

· Intensified efforts in expanding global market
· Launched Z BOX liquid cooling battery energy storage system, obtained CGC and CE certification
· Launched a 2GWh energy storage factory inJiangxi and planned a new 2GWh factory

2024

The Group is ranked among China's Top 500 Energy Enterprises, recognized as a Tier 1 global energy storage manufacturer, and has become the largest operator of direct-dispatch virtual power plants in Zhejiang.

Industrial Landscape


European Offices : Netherlands, Poland, Sweden, Spain
Planning a European factory
Headquarters: Shanghai
· R&D Center: Jiangsu
· Manufacturing Plants: Jiangxi
· Digital Center: Shanghai
Expanding into the Southeast Asian market
Expanding into the Australian market
Expanding into the Middle East market

Product Technology R&D Center

The R&D team, comprising PhD experts in electrochemistry, power electronics, electrical engineering, and materials science, collaborates with renowned institutions to advance cuttingedge research, foster talent, and drive innovation in energy storage technologies. The team has independently developed core technologies, including EMS, BMS, PCS, and energy storage system integration, securing over 100 patents and software copyrights. Notable achievements include the world's first multi-dimensional acoustic fusion sensor, a revolutionary innovation in safety monitoring; the Z BOX-I, a modular energy storage product with millisecond-level precision; and advanced FFR capabilities that exceed stringent Nordic market requirements, positioning the team among global leaders.

TMP Laboratory by TÜV Rheinland

100+

CORE PATENTS

TÜV NORD Witness Laboratory

Digital Energy R&D Center

Focusing on commercial and industrial energy storage needs, ZOE Energy Storage has developed Z-DIGITAL, a digital energy ecosystem that utilizes digital and smart technologies to aggregate diverse energy sources effectively, thus achieving resource optimization, energy management and trading, as well as carbon reduction.

Z Digital

Z-EMS

Energy Management System

- Internet of Things
- Artificial Intelligence
- Energy Monitoring
- Smart O&M
- Intelligent Strategy
- Battery Diagnostics
- Asset Profitability

Z-VPP

Virtual Power Plant

- Energy Monitoring
- Resource Aggregation
- Resource Allocation
- Command Decomposition
- Transaction Declaration
- Transaction Settlement

Z-Zone

Zero Carbon Zone System

- Power Energy Monitoring
- Electrical Safety Alerts
- Power Quality Management
- Energy Consumption Analysis
- Smart O&M
- Carbon Management and Services

Z-AMS

Asset Management System

- Asset Approval
- Asset Measurement
- Asset Evaluation
- Asset Safety

Z-SMS

Safety Management System

- Cell-Level
- Module-Level
- Cluster-Level
- Station-Level

Z Digital

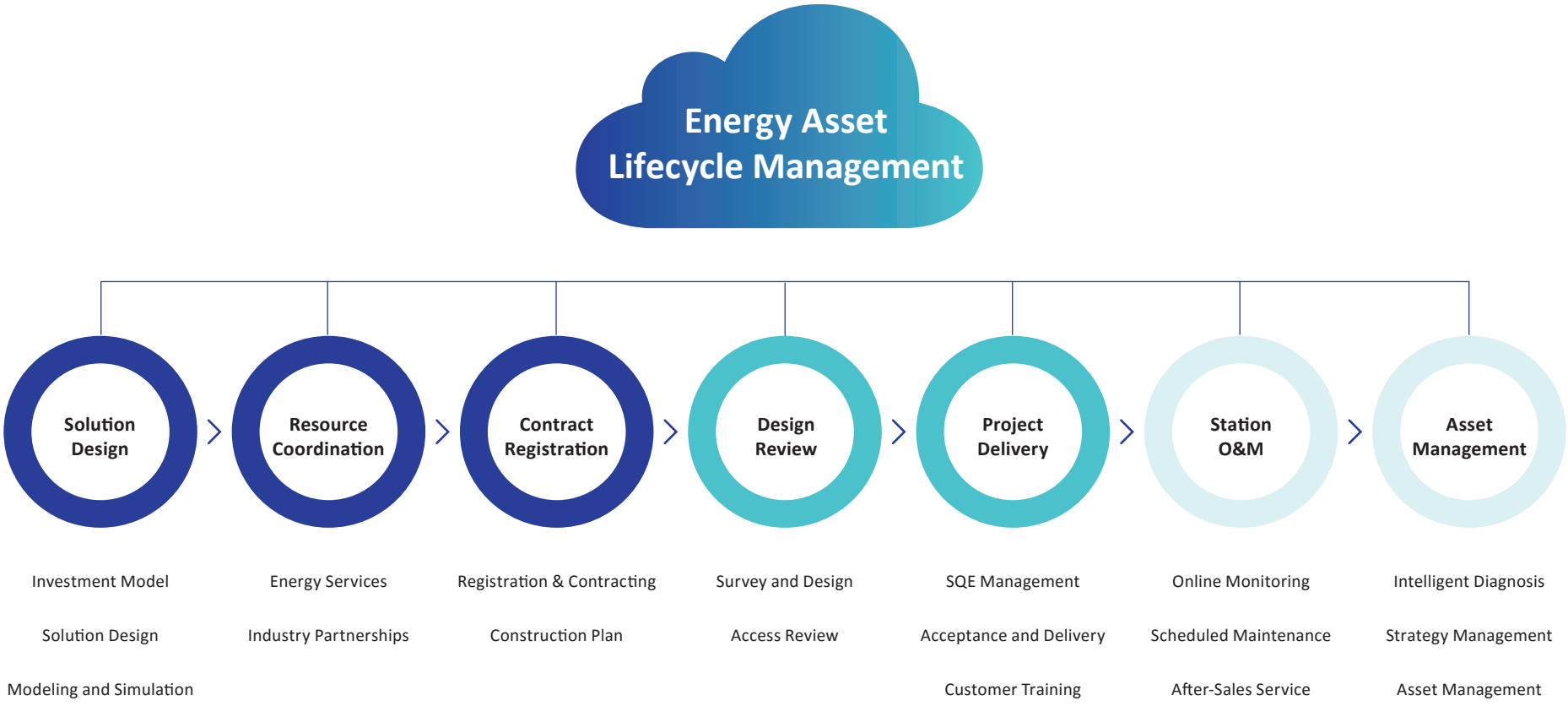
makes energy management smarter

Manufacturing

4GWh
Intelligent Energy Storage Factory

The company operates advanced energy storage factories with a total capacity of 4GWh in 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.

Lifecycle Management



ZOE Energy Storage Global Product Series

Z BOX-H | Z BOX-C | Z BOX-I | Z BOX-P | Z PCS | Z EMS

TIER 1
BloombergNEF
Energy Storage Manufacturer

Tier1 Global Energy Storage Manufacturer by BNEF








CheckWatt Compatibility FCR-D/FFR

Our products are certified for global safety, quality, and performance standards.

- **CE Certified:** Compliant with European LVD and EMC standards.
- **Grid Connection Certified:** Certified under EN 50549-1, compliant with grid requirements in the Czech Republic, Germany, Hungary, Italy, the Netherlands, Norway, Poland, Spain, Sweden, and the UK.
- **Carbon Footprint:** Product carbon footprint certified to ISO 14067 standard.

Energy Storage Cabinet

ALL-IN-ONE ESS Cabinet

Z BOX-C

C 215-2H 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
Rated DC voltage	768 V
Rated DC voltage range	672~864 V
Rated DC current	140 A
AC data	
Rated AC power	105 kW
Rated AC voltage	400 Vac
Rated frequency	50/60 Hz
Rated AC current	152 A
Max. AC current	167 A
AC wiring type	3W/N+PE
Power factor	-1 ~ 1
General Data	
DOD	95%
Noise	≤75dB
Protection degree	IP 55 (Battery room&PCS room)
Cooling method	Liquid cooling/ heating
Fire suppression system	Aerosol
Operating temperature range	-20 ~ 55 ° C (> 45° C derating)
Relative humidity	5% ~ 95% RH
Max.working altitude	2000 m
Display	Web/ LED
COM interfaces	RS485/ Ethernet/ 4G (optional)
Dimensions (L*W*H)	1344*1399*2080 mm
Weight	2450±50 kg

Safe & Reliable

· Cabinets physically separated for safety

· SMS System for layered security

· High-quality, efficient lithium batteries

· Full lifecycle management

Cost-efficient

· Rapid power response for virtual power plants, grid connection, and off-grid operation

· Intelligent balancing strategies maintain battery consistency

· Dynamic energy regulation strategy switching

Flexible Deployment

· Modular design for easy expansion

· Enables centralized deployment, decentralized deployment, and integration with solar storage charging

Smart Management

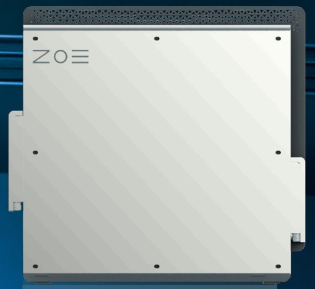
· Cloud-edge-end collaboration for 24/7 monitoring, ensuring safe and stable equipment operation

· Cloud-based big data and intelligent algorithms for flexible system strategy adjustment

Energy Storage Cabinet

Battery Cabinet

Z BOX-H



Z PCS 200kW

PCS and Battery Cabinet Solution

H 372-2H 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
Rated DC voltage	1331.2 V
Rated DC voltage range	1164.8~1497.6 V
Rated DC current	140 A
General Data	
DOD	95%
Noise	≤75dB
Protection degree	IP 55 (Battery room)
Cooling method	Liquid cooling/ heating
Fire suppression system	Aerosol
Operating temperature range	-19 ~ 55° C (> 45° C derating)
Relative humidity	5% ~ 95% RH
Max.working altitude	2000 m
Display	Web/ LED
COM interfaces	RS485/ Ethernet
Dimensions (L*W*H)	1330*1370*2270 mm
Weight	3550±50 kg

Safe & Reliable

· Cabinets physically separated for safety

· SMS System for layered security

· High-quality, efficient lithium batteries

· Full lifecycle management

Cost-efficient

· Rapid power response for virtual power plants, grid connection, and off-grid operation

· Intelligent balancing strategies maintain battery consistency

· Dynamic energy regulation strategy switching

Flexible Deployment

· Modular design for easy expansion

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Smart Management

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· Cloud-based big data and intelligent algorithms for flexible system strategy adjustment

Energy Storage Cabinet

ALL-IN-ONE ESS Cabinet

Z BOX-I

LOW COSTS

· Plug and play design

· Highly integrated for easier transport and installation

SAFE & RELIABLE

· Integrates AI pre-alarm

· Ultra safe design with complete FFS

FLEXIBLE

· 6 models in single cabinet

· Modular design for easy system expansion

EFFICIENT

· Intelligent fan cooling ensures longer lifespan

· System efficiency ≥89%

I 156-1H 150kW / 156kWh | 1C

Model	I01-90KN-94	I01-100KN-104	I01-110KN-114	I01-120KN-125	I01-120KN-135	I01-150KN-156
Battery data						
Cell type	LFP					
Rated capacity	102 Ah					
Serial-parallel type	2P144S	2P160S	2P176S	2P192S	2P208S	2P240S
Rated capacity per pack	10.444 kWh					
Pack number	9	10	11	12	13	15
System rated energy capacity	93.996 kWh	104.44 kWh	114.884 kWh	125.328 kWh	135.772 kWh	156.66 kWh
Rated DC voltage	460 V	512 V	563 V	614 V	665 V	768 V
Rated DC voltage range	403~518 V	448~576 V	492~633 V	537~691 V	582~748 V	672~864 V
AC Data						
Rated AC power	90 kW	100 kW	110 kW	120 kW	120 kW	150 kW
Rated AC voltage	400 Vac					
Rated frequency	50/60 Hz					
Rated AC current	129 A	144 A	158 A	173 A	173 A	216 A
AC wiring type	3W/N+PE					
Power factor	-0.8 ~ 0.8					
General Data						
DOD	95%					
Noise	≤75dB					
Protection degree	IP 54					
Cooling method	Intelligent fan cooling					
Fire suppression system	Novec 1230 + Aerosol					
Operating temperature range	-30 ~ 60 ° C (> 45° C derating)					
Relative humidity	0% ~ 95% RH (non-condensing)					
Max.working altitude	2000 m					
Display	LED + Touch Screen (Optional)					
COM interfaces	WiFi + LAN+4G					
Dimensions (L*W*H)	1500*1600*2200 mm					
Weight	2290±50 kg	2375±50 kg	2460±50 kg	2545±50 kg	2630±50 kg	2800±50 kg

Energy Storage Container

Z BOX-P

ALL-IN-ONE ESS Container

Flexible applications
· Highly efficient liquid-cooled cooling and heating for extreme environments
· Compact design with Back-to-back layouts for a reduced footprint

Efficient charging and discharging
· Meet high-rate charging and discharging scenarios, with a maximum continuous power of up to 1P

Safety and reliability
· Electrical safety management, overcurrent fast-breaking and arc extinguishing protection
· Pack-level fire protection and prediction of thermal runaway risk

Convient O&M
· One-click system upgrade and unified management
· Cloud-based monitoring allows for the quick identification of faults and reduce staff effort

P 1300-1H

P1313L1H-A-EU 1.26MW/ 1.313MWh | 1C

Battery Data	
Cell type	LFP
Rated capacity	285 Ah
Serial-parallel type	6P240S
Rated capacity per pack	43.776 kWh
Pack number	6*5
System rated energy capacity	1313.28 kWh
Rated DC voltage	768 V
Rated DC voltage range	672~864 V
Rated DC current	1710 A
AC Data	
Rated AC power	1260 kW
Rated AC voltage	400 Vac
Rated frequency	50/60 Hz
Rated AC current	1818 A
Max. AC current	2004 A
AC wiring type	3W/ N+PE
Power factor	-0.85 ~ 1

General Data	
DOD	90%
Noise	≤80dB
Protection degree	IP 54
Cooling method	Liquid cooling/ heating
Fire suppression system	Aerosol
Operating temperature range	-30 ~ 55 °C (> 45°C derating)
Relative humidity	5% ~ 95% RH
Max.working altitude	2000 m
Display	Web/ LED/ LCD
COM interfaces	RS485/ Ethernet
Dimensions (L*W*H)	6058*2438*2591 mm
Weight	18±0.5 T

Energy Storage Container

Z BOX-P

Battery Container

P 3400 3440kWh

P 3400- 2H
P3440L2H-B | 0.5C

P 3400- 1H
P3440L1H-B | 1C

Battery Data	
Cell type	LFP
Rated capacity	280 Ah
Serial-parallel type	10P384S
Rated capacity per pack	43.008 kWh
Pack number	10*8
System rated energy capacity	3440.64 kWh
Rated DC voltage	1228.8 V
Rated DC voltage range	1075.2~1382.4 V
Charge-discharge rate	1C(P3440L1H-B)/ 0.5C(P3440L2H-B)

General Data	
DOD	95%
Noise	≤80dB
Protection degree	IP 55
Cooling method	Liquid cooling/ heating
Fire suppression system	Aerosol
Operating temperature range	-30 ~ 50 °C (> 45°C derating)
Relative humidity	0% ~ 95% RH (non-condensing)
Max.working altitude	3000 m
Display	Web
COM interfaces	Modbus TCP/IP
Dimensions (L*W*H)	6058*2438*2896 mm
Weight	33.5±0.5 T

Energy Storage Container

Z BOX-P

Battery Container

P 5000-2H P5015L2H-A-EU 5015kWh l 0.5C

Battery Data	
Cell type	LFP
Rated capacity	314 Ah
Serial-parallel type	12P416S
Rated capacity per pack	104.499 kWh
Pack number	12*4
System rated energy capacity	5015.96 kWh
Rated DC voltage	1331.2 V
Rated DC voltage range	1164.8~1497.6 V

Safety
· Intelligent safety management

Lower cost
· Higher Energy Density
· Transportation of complete system

Efficient O&M
· Intelligent Design for back-to-back and end-to-end Layout

General Data	
DOD	95%
Noise	≤80dB
Protection degree	IP 55
Cooling method	Liquid cooling/ heating
Fire suppression system	NOVEC 1230 /Aerosol (optional)
Operating temperature range	-30 ~ 50 °C (> 45°C derating)
Relative humidity	0% ~ 95% RH
Max.working altitude	3000 m
Display	Web
COM interfaces	RS485/CAN/Ethernet
Dimensions (L*W*H)	6058*2438*2896 mm
Weight	41 T

Application Scenario

Generation/Grid Side Energy Storage

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

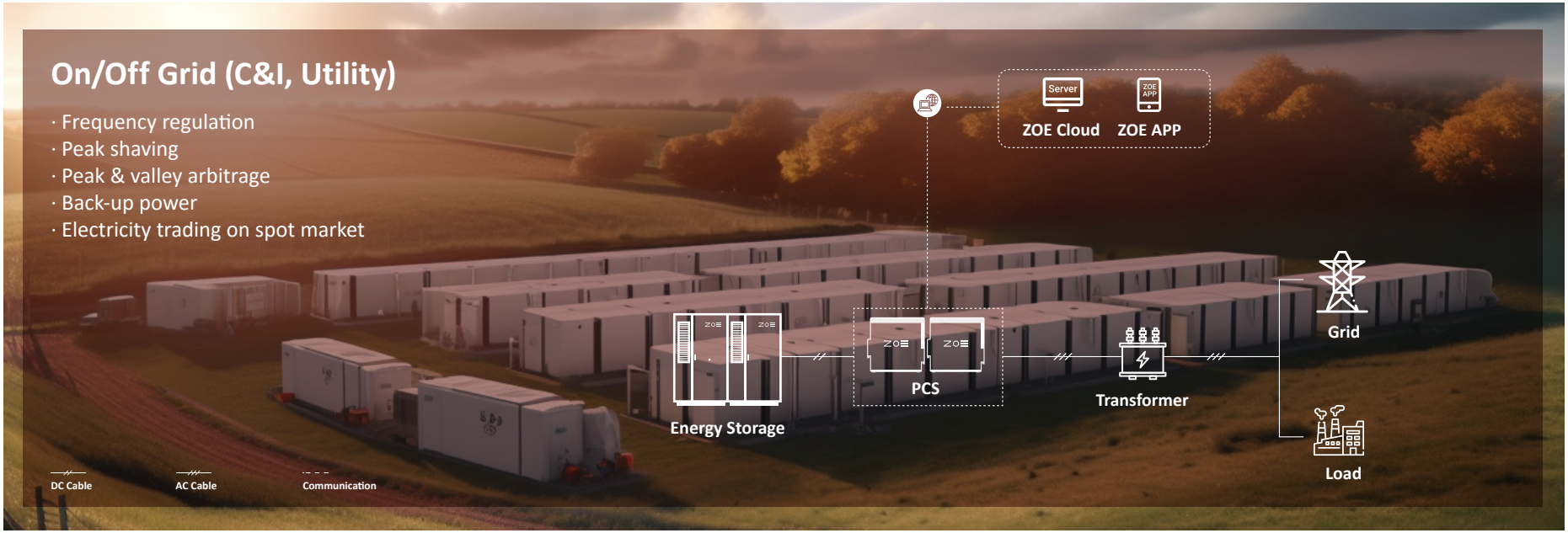
Commercial & Industrial Energy Storage

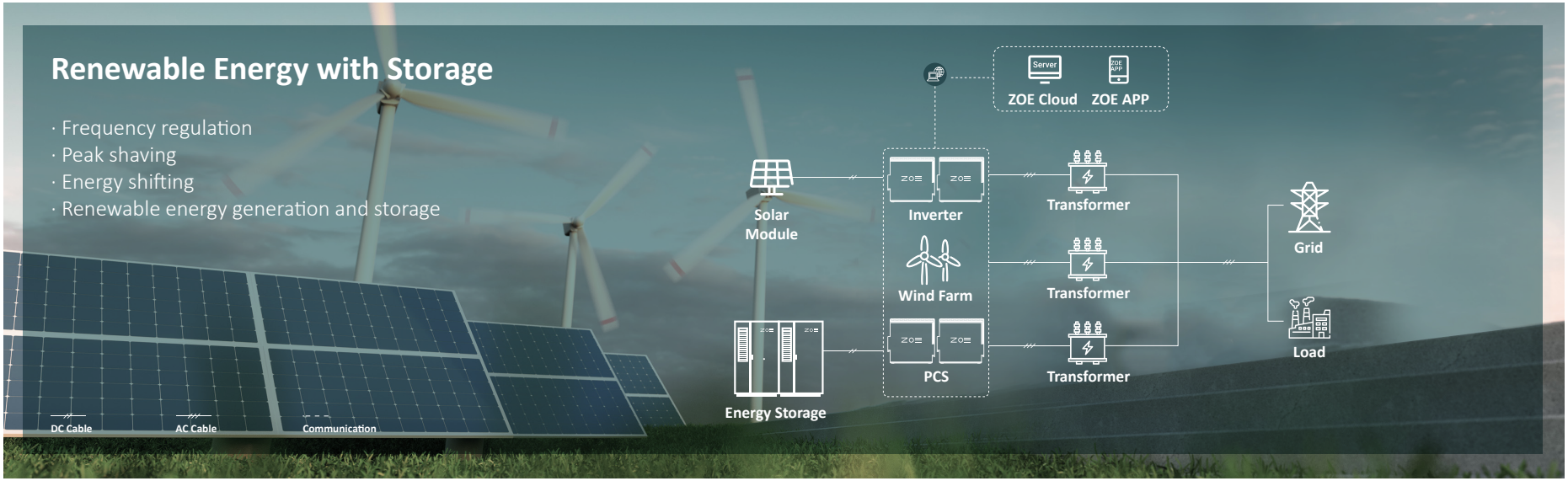
Offering tailored energy storage solutions for commercial and industrial demands, our modular design flexibly fits diverse settings, enhancing investment return. Focused on peak and valley power management, these solutions facilitate peak shifting and load leveling, reducing grid stress and electricity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

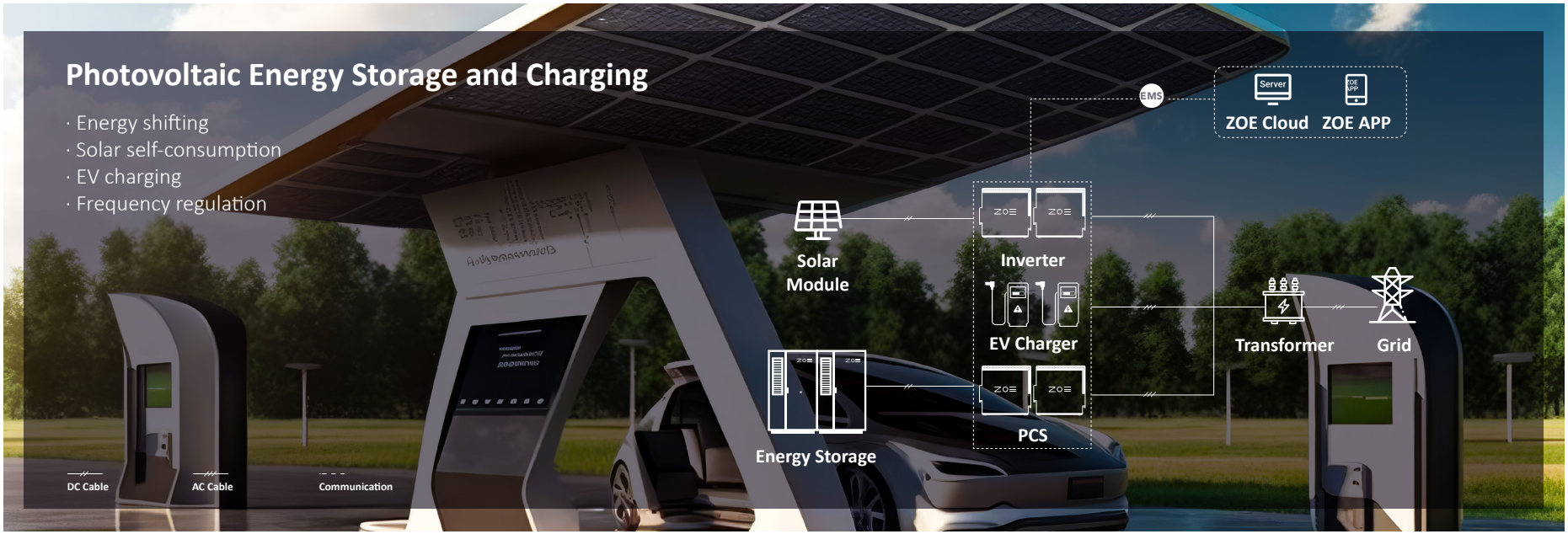
Scenarios: Full electrification, industrial parks, ports, office buildings, data centers, PV-storage-charging, etc

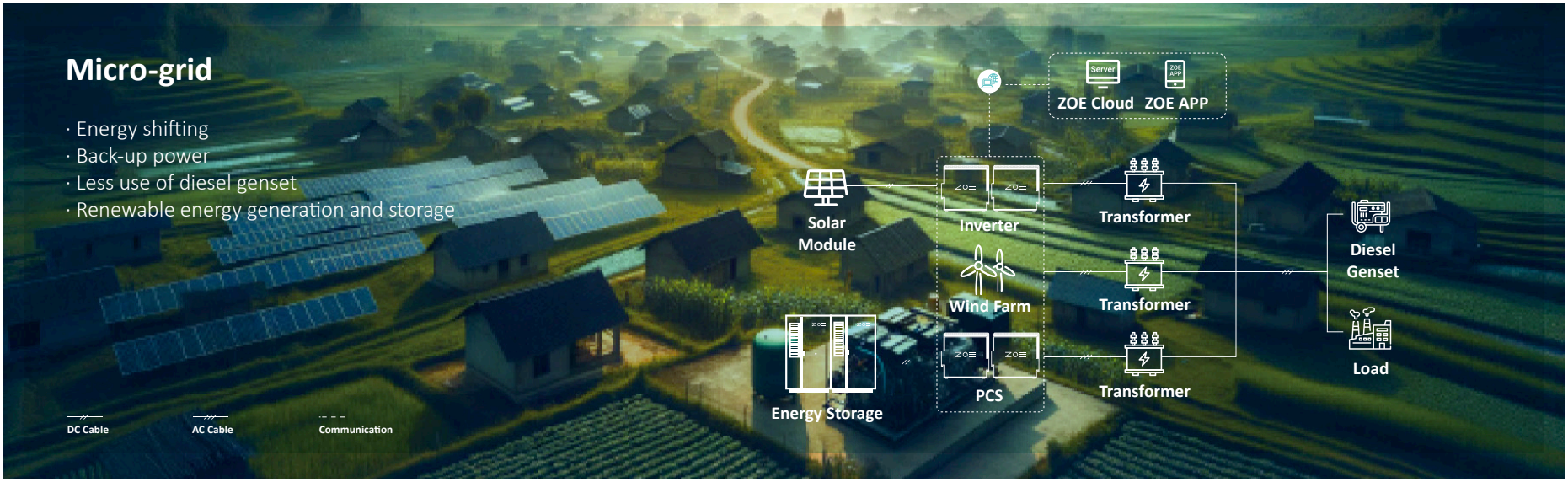
Demands: Power rationing, high peak rates, demand charges, capacity shortages, costly transformer upgrades, spatial constraints, ESG compliance

Solutions


On/Off Grid (C&I, Utility)
· Frequency regulation
· Peak shaving
· Peak & valley arbitrage
· Back-up power
· Electricity trading on spot market
Server
ZOE Cloud
ZOE APP
Grid
PCS
Transformer
Energy Storage
Load
DC Cable
AC Cable
Communication


Renewable Energy with Storage
· Frequency regulation
· Peak shaving
· Energy shifting
· Renewable energy generation and storage
Server
ZOE Cloud
ZOE APP
Solar Module
Inverter
Transformer
Grid
Wind Farm
Transformer
Load
PCS
Transformer
Energy Storage
DC Cable
AC Cable
Communication


Photovoltaic Energy Storage and Charging
· Energy shifting
· Solar self-consumption
· EV charging
· Frequency regulation
EMS
Server
ZOE Cloud
ZOE APP
Solar Module
Inverter
EV Charger
PCS
Energy Storage
Transformer
Grid
DC Cable
AC Cable
Communication


Micro-grid
· Energy shifting
· Back-up power
· Less use of diesel genset
· Renewable energy generation and storage
Server
ZOE Cloud
ZOE APP
Solar Module
Inverter
Wind Farm
PCS
Energy Storage
Transformer
Transformer
Transformer
Diesel Genset
Load
DC Cable
AC Cable
Communication

Benchmark Cases - Utility

Solution:
· 27MW / 27MWh
· Z BOX-H 372kWh

Scenario:
PV power generation

Application:
· Renewable integration
· Energy shifting
· Curtailment avoidance

Benchmark Cases - Utility

Solution:
· 30MW / 60MWh
· Z BOX-H 372kWh

Scenario:
PV-ESS-hydrogen integration project

Application:
· Renewable integration
· Energy shifting
· Green hydrogen production

Benchmark Cases - Commercial & Industrial

Solution:
· 11MW / 22MWh
· Z BOX-H 372kWh

Scenario:
Copper foil factory

Application:
· Peak shaving
· Solar self-consumption
· Backup power

Benchmark Cases - Commercial & Industrial

Solution:
· 0.858MW / 2.604MWh
· Z BOX-C 186kWh

Scenario:
Home furnishing factory

Application:
· Peak-Valley arbitrage
· Demand response

Benchmark Cases - Commercial & Industrial

Solution:
· 630kW / 1290kWh
· Z BOX-C 215kWh

Scenario:
Solar park

Application:
· Solar self-consumption
· Frequency regulation

Benchmark Cases - Commercial & Industrial

Solution:
· 315kW / 645kWh
· Z BOX-C 215kWh

Scenario:
Vacant lot

Application:
· Frequency regulation

Benchmark Cases - Commercial & Industrial

Solution:
· 2MW / 2.2MWh
· Z BOX-P

Scenario:
One of Sweden's oldest smelters

Application:
· Frequency regulation

Benchmark Cases - Commercial & Industrial

Solution:
· 1.023MW / 2.046MWh
· Z BOX-C 186kWh

Scenario:
Food processing factory

Application:
· Peak-Valley arbitrage
· Demand response

Benchmark Cases-PV + Storage + Charging

Solution:
· 105kW / 215kWh
· Z BOX-C 215kWh

Scenario:
Highway service area

Application:
· EV charging
· Transformer capacity expansion

Benchmark Cases-PV + Storage + Charging

Solution:
· 93kW / 186kWh
· Z BOX-C 186kWh

Scenario:
Parking lot

Application:
· EV charging
· Solar self-consumption
· Transformer capacity expansion

Benchmark Cases - Micro-Grid

Solution:
· 105kW / 215kWh
· Z BOX-C 215kWh

Scenario:
Vacant lot

Application:
· Micro-grid
· Backup power

Benchmark Cases - Micro-Grid

Solution:
· Z BOX-C 186kWh
· Z BOX-H 372kWh

Scenario:
Tibetan plateau

Application:
· Solar self-consumption
· Low-temperature performance testing








Ferrita















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ENERGY FOR LIFE