

Moose Energy Management System

Moose Cloud & Moose Cube



About huafon ESS

Huafon Group, headquartered in Ruian, Zhejiang, has been committed to growing with the community, customers and employees since 1991, and pursuing sustainable development by breaking through the traditional private business development model, balancing development speed and quality, integrating expansion and optimization, and aligning business with social benefits. We are one of the largest manufacturers and distributors of polyurethane products in the world, with industrial bases and sales companies in 6 provinces / municipalities and countries along the "Belt & Road", more than 50 wholly-owned or holding companies and nearly 16,000 employees. We offer a dozen of products including polyurethane system polyurethane resin, spandex filament, microfiber material, TPU, nylon 66, adipic acid, and aluminum heat transfer material and rank among companies with highest capacity and market share in China and the world.

Huafon ESS is invested and established by one of China's top 500 enterprises Huafon Group, which represents a firm strategic step forward in new energy industry for Huafon Group.

Huafon ESS is dedicated to making energy safer, more efficient, and cleaner. We strive to build an intelligent platform for integrated-energy operation services, empowering the future of clean energy through the combination of Internet and new energy tech. We provide dynamic integration of in-house smart devices and self-developed AI operation software platform - the Huafon Moose Cloud Platform. Meanwhile, with relentless big data analysis from our platform, we are able to meet customers' needs in all scenarios and improve customer experience significantly.



Mission

To make energy safer, more efficient, and cleaner.



Vision

To build an intelligent integrated-energy operation service platform.



Value

Passion, Focus, Positivity, Responsibility

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Moose Cloud



Huafon ESS Moose Cloud provides multi-dimensional services, including global display, intelligent topology, comprehensive monitoring, situational awareness, health assessment, energy analysis, and comprehensive diagnosis. It helps users improve power plant production efficiency, reduce energy consumption, and enhance business economic benefits.



Battery Asset Management — Green Energy with High Efficiency — Cloud-Edge Smart Control

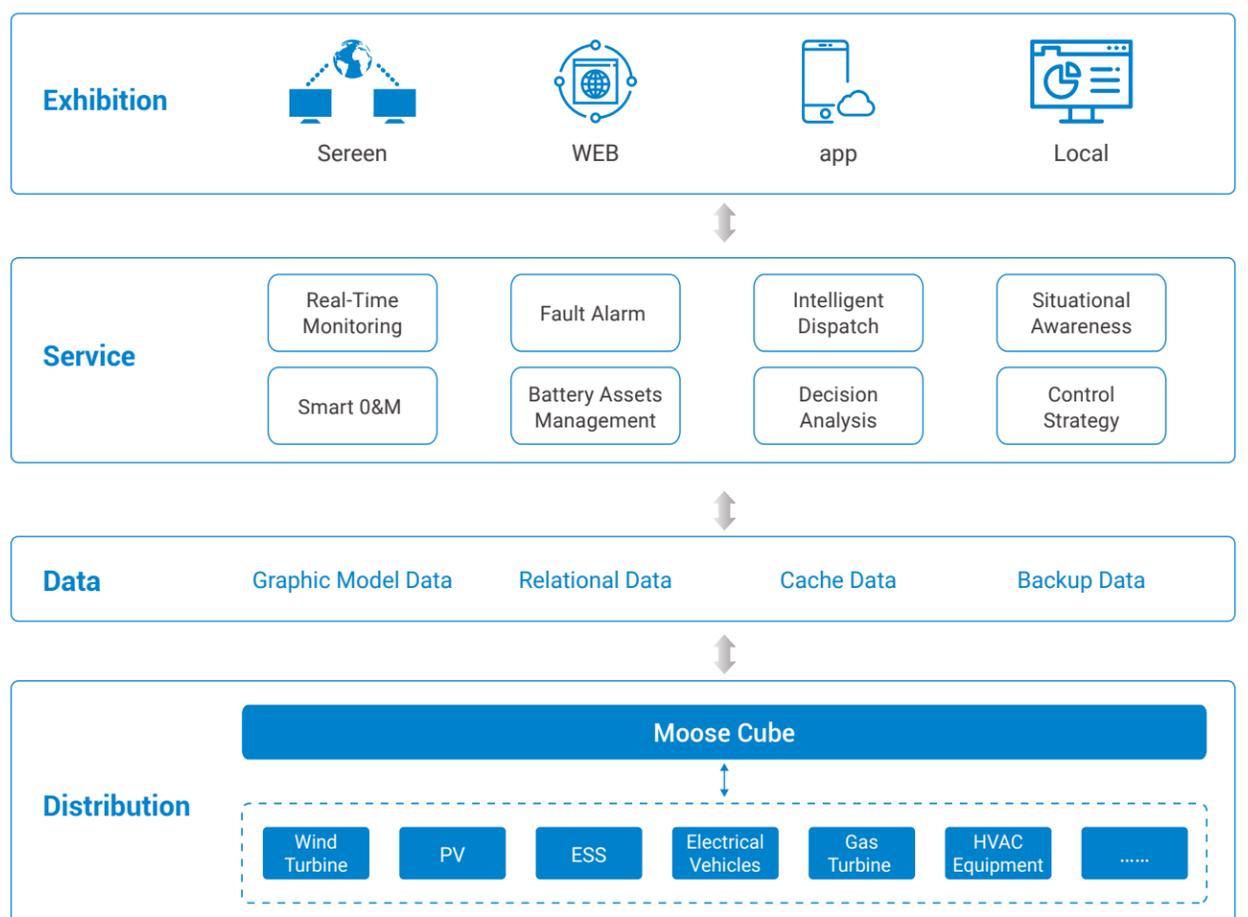
- All Info at a Glance
- Easy and Fast Operation
- Intelligent Warning
- Full Lifecycle Protection of Battery Health

- AI + Big Data
- Accurate Prediction
- Energy Optimal Scheduling
- Refined Operational Management

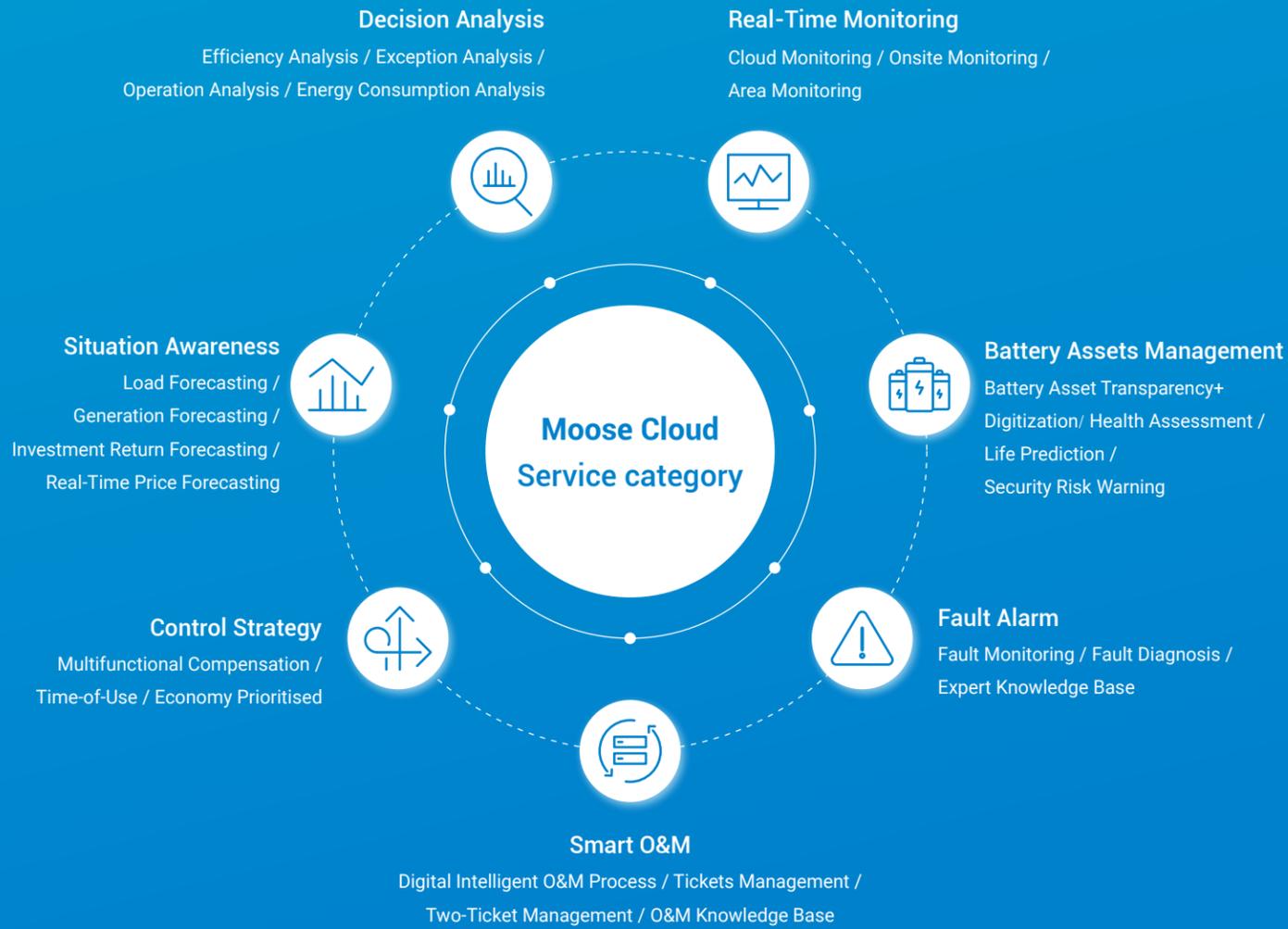
- Powerful Edge Computing
- Cloud-Based Rapid Decision-Making
- Dynamic Strategy Optimization
- Meet the Needs of All Scenarios



Service Architecture



What Moose Cloud Provides



• Control Strategy



Big Data + AI

Applied with multiple AI algorithms and big data training, it has a strong generalization ability.

Optimal Dispatch

Developing energy optimization scheduling plans that meet economic, environmental, and technical requirements to enhance project profitability.

• Real-Time Monitoring



Panoramic layout

Clear panoramic layout exhibited

Environment Monitoring

Complete monitoring information on video and fire control

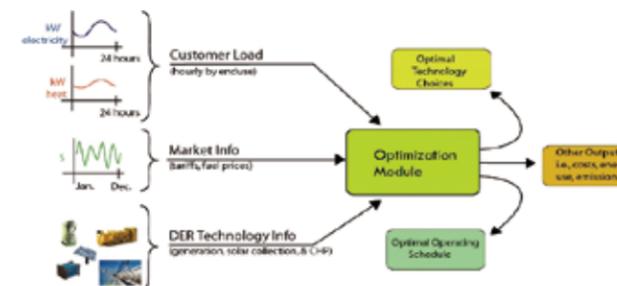
Full-Site Monitoring

Real-time graphical control and full-system data

Equipment Monitoring

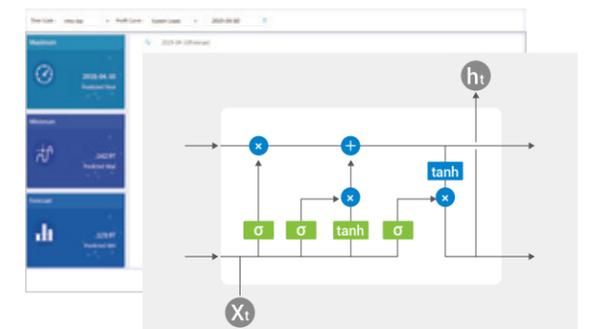
Equipment details and real-time status tracking

• Decision Analysis



Through the analysis of system data and combining with distributed power generation prediction, load prediction, and energy storage unit status, the system's statistical analysis and optimization decision-making can be achieved.

• Situation Awareness



Load & Generation Forecasting

Situation awareness realizes the prediction of distributed power output, cooling, heating and power load, weather, etc., and provides data sources for the evaluation of the global state of the power grid and the calculation of operational trajectory status indicators.

• Battery Assets Management

Health Evaluation

Real-time monitoring of battery health dynamics;
Accurate location of abnormal batteries;
Diagnosis of system health performance



Life Prediction

Artificial intelligence predicts battery remaining life and evaluates overall revenue and financial value of the power station.



Security Alert

Big data analysis identifies potential risks in batteries and prevents safety accidents.



Battery Transparency + Digitization

Digitized presentation of battery assets, real-time status at a glance.



01

ESS Lifecycle Cost Model

Establish a full lifecycle cost model for energy storage, continuously evaluate, give feedback, and improve

02

ESS Control and Operation Strategy

During the operational phase, the control strategy is continuously optimized to ensure the best economy over the entire lifecycle.

03

ESS Health Status Assessment

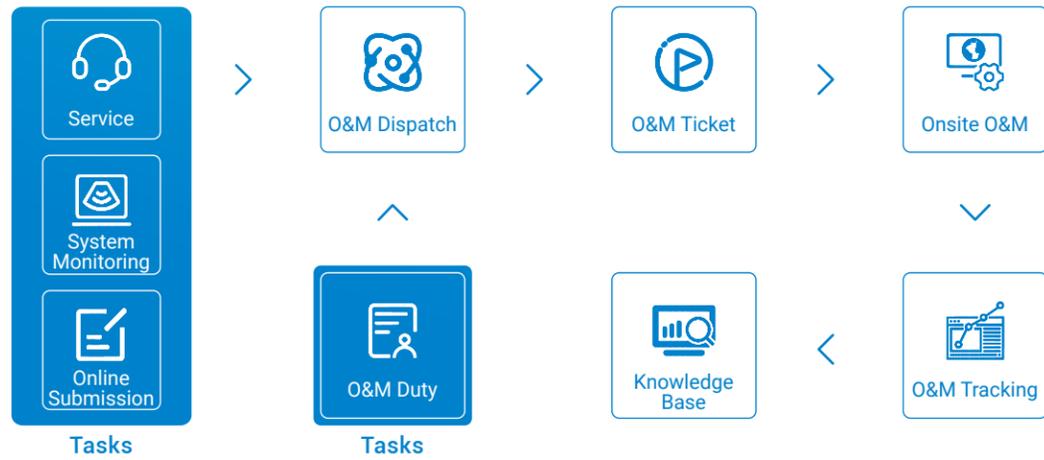
Adjust the strategy based on the real-time health status of the battery, and design a health assessment model and algorithm to ensure safety and efficiency.

04

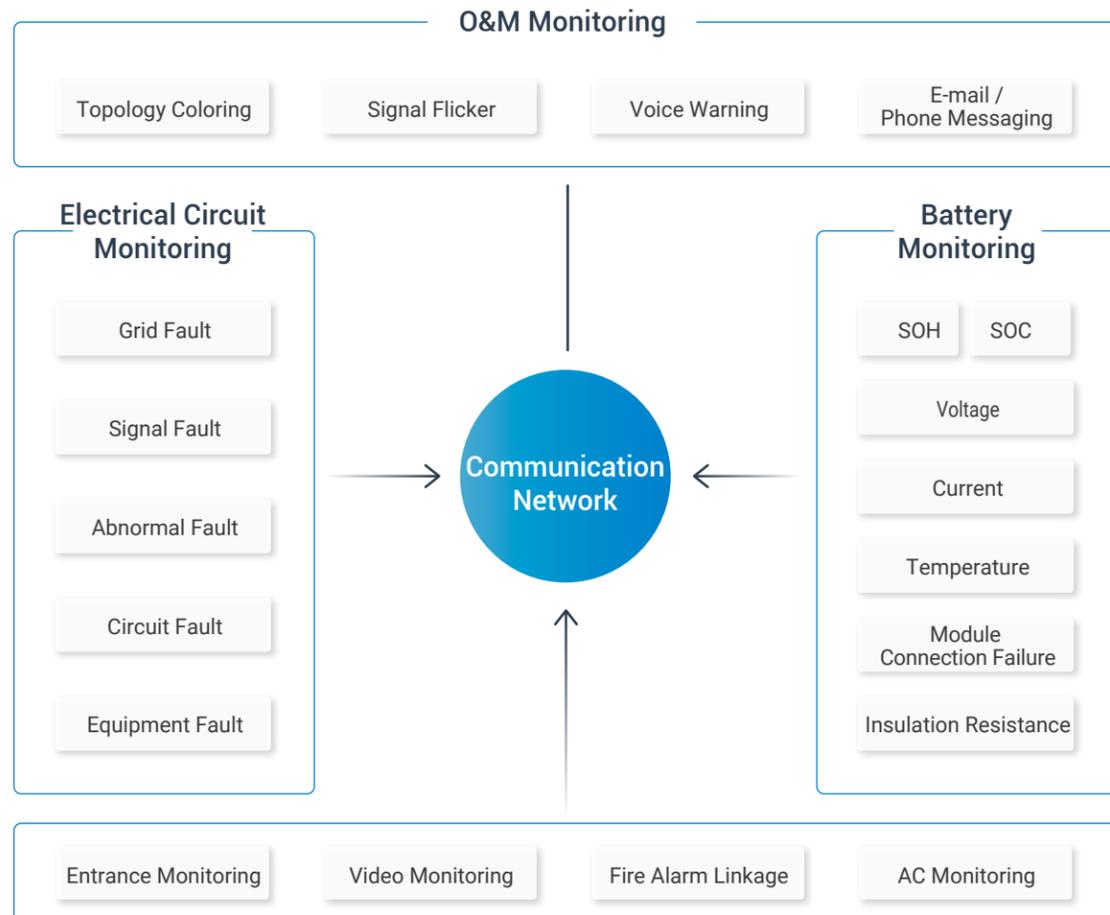
Dynamic Cell Balancing Technology

Effectively address the capacity loss caused by battery health issues, and provide accurate battery operation and maintenance solutions and performance estimates.

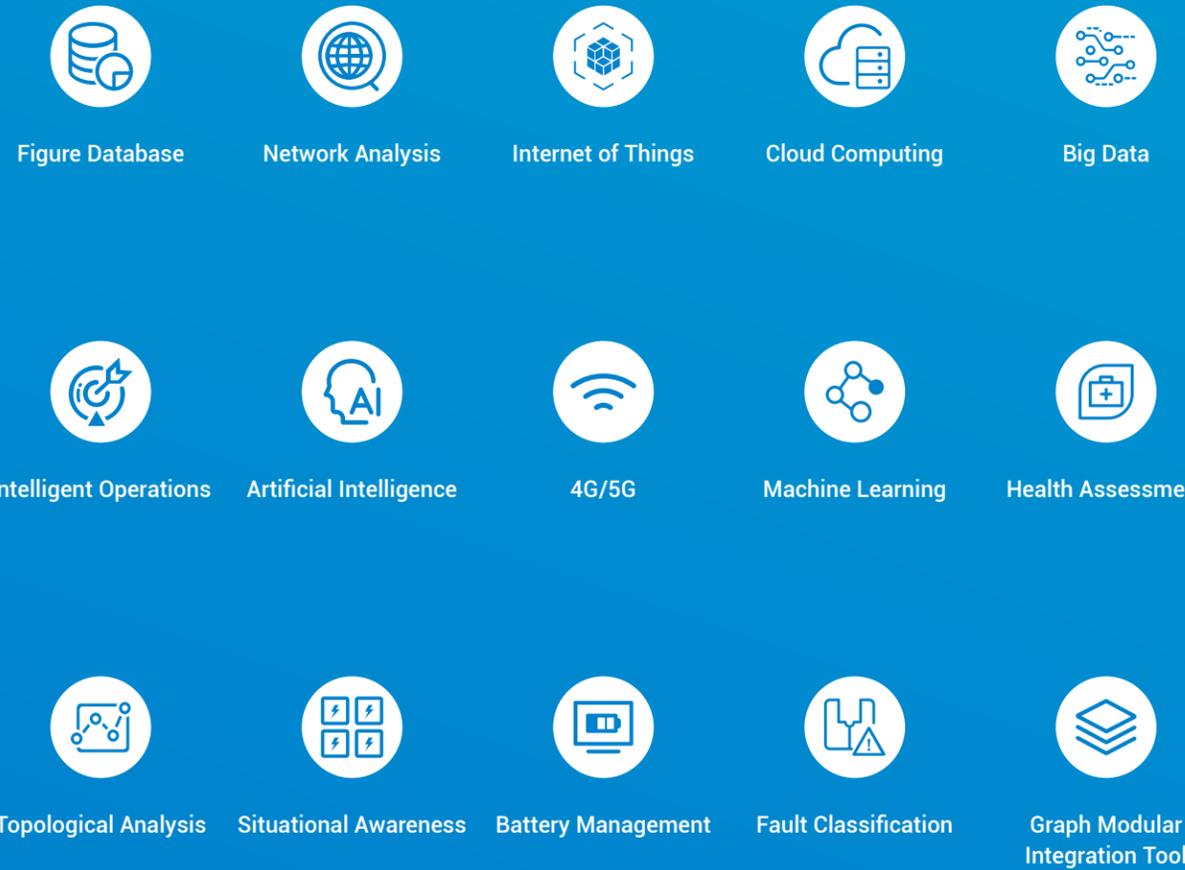
• Smart O&M



• Fault Alarm



Technical Advantage



Platform Value

Efficient Operation Requirements

Investors, Project Operators, Operational Service Providers, End Users, and Partners (adjusted according to varied demands).

Efficiency

- ⌚ Improve power plant utilization efficiency
- ⌚ Improve equipment operation efficiency
- ⌚ Improve O&M efficiency
- ⌚ Improve operation and management efficiency
- ⌚ Improve investment decision-making efficiency
- ⌚ Improve load dispatching efficiency

Cleanliness

- ⌚ Energy structure optimization
- ⌚ Enterprise energy efficiency monitoring
- ⌚ Energy saving and emission reduction analysis
- ⌚ Carbon asset management
- ⌚ Carbon emission accounting
- ⌚ Carbon trading decision making

Economy

- ⌚ Reduce O&M costs
- ⌚ Extend assets life
- ⌚ Reduce operational losses
- ⌚ Economic operation strategy
- ⌚ Grid auxiliary services
- ⌚ Demand-side response

Security

- ⌚ Battery capacity testing
- ⌚ Battery life forecasting
- ⌚ Battery abnormality monitoring
- ⌚ Security risk warning
- ⌚ Improving asset availability
- ⌚ Improving system reliability

Moose Cube



Moose Cube is a central controller specifically designed for Distributed Energy Resources (DER) and Microgrid Systems (MGS). It has functions such as controlling and protecting distributed energy resources, monitoring energy quality, and cloud-edge collaboration. The controller is compatible with various types of devices, such as embedded devices, smart electrical and electronic devices, etc.

Low-code simplifies the development process, and reduces maintenance time and cost.

Event-driven reduces communication resource waste, enabling digitization and multi-threaded control.

Complete AOE event-driven control strategy execution framework, adaptable to highly uncertain environments.

Functions

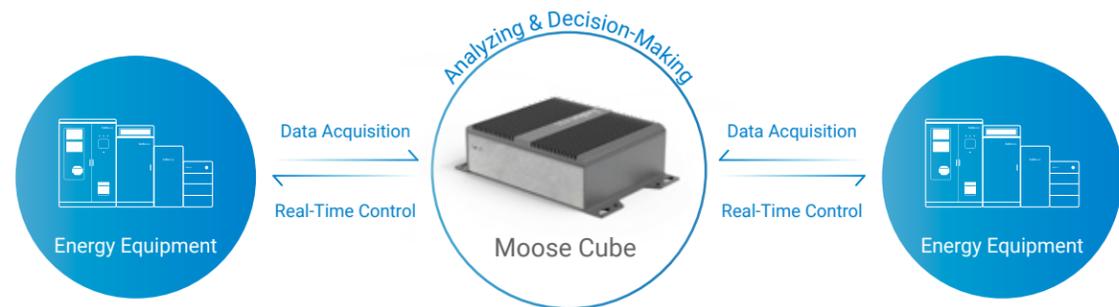
Equipped with various operations, equation solving, optimization model solving and other functions, significantly reducing the amount of code written, minimizing code error rates, supporting collaborative control of multiple controllers, and providing a universal and generalizable control strategy implementation approach for different industrial control scenarios.

 **Lightweight Database**

 **High-Performance Computing**

One device replaces one set of devices

- High Integration
- Plug and Play
- Light and Flexible
- Easy to Maintain



Access Device	Application Field
New Energy	Factory
Traditional Energy	Islands & Mining Areas
ESS	Commercial Complex
Smart Industrial	Energy Station
...	...

Cube Value

Highly Integrated

- The product can be integrated with local EMS, centralized control devices, etc., and one device can replace a set of devices

Multi-Scenario Application

- Simplifying power control and industrial control into generic mathematical models that are highly adaptable to various scenarios

Easy to maintain

- It uses low-code technology to reduce user maintenance difficulty and minimize maintenance time

Cloud-edge collaboration

- It has strong edge computing capabilities and can work in synergy with cloud-based intelligent decision-making

AI technology

- Supporting more advanced mathematical computations, implementing various intelligent algorithms, and achieving efficient, reliable, and cost-effective optimization operations on its own

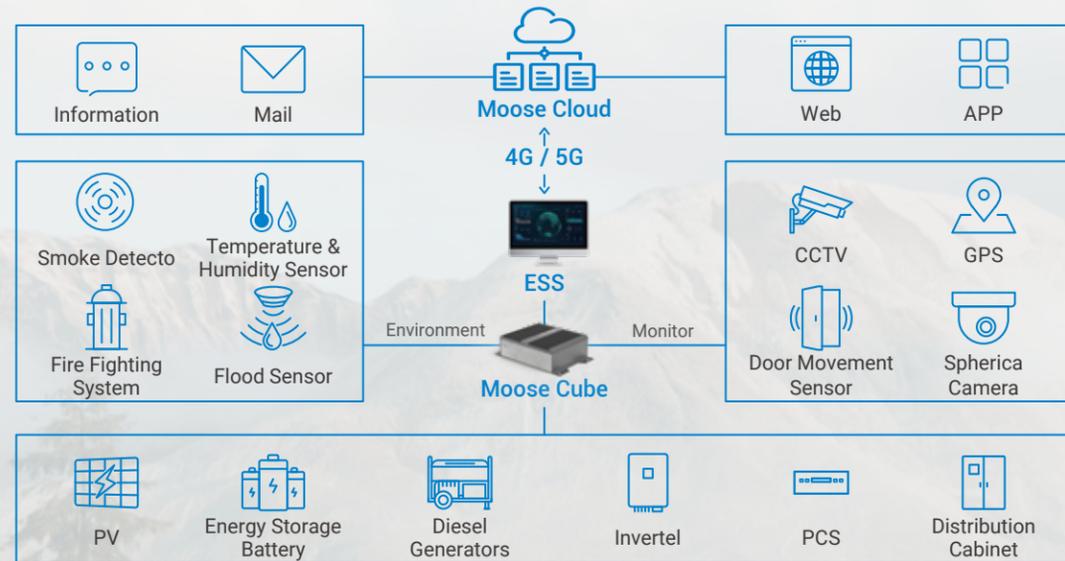
High scalability

- It integrates mainstream protocol libraries and a universal EMS application, supports hierarchical coordinated control, and has strong scalability

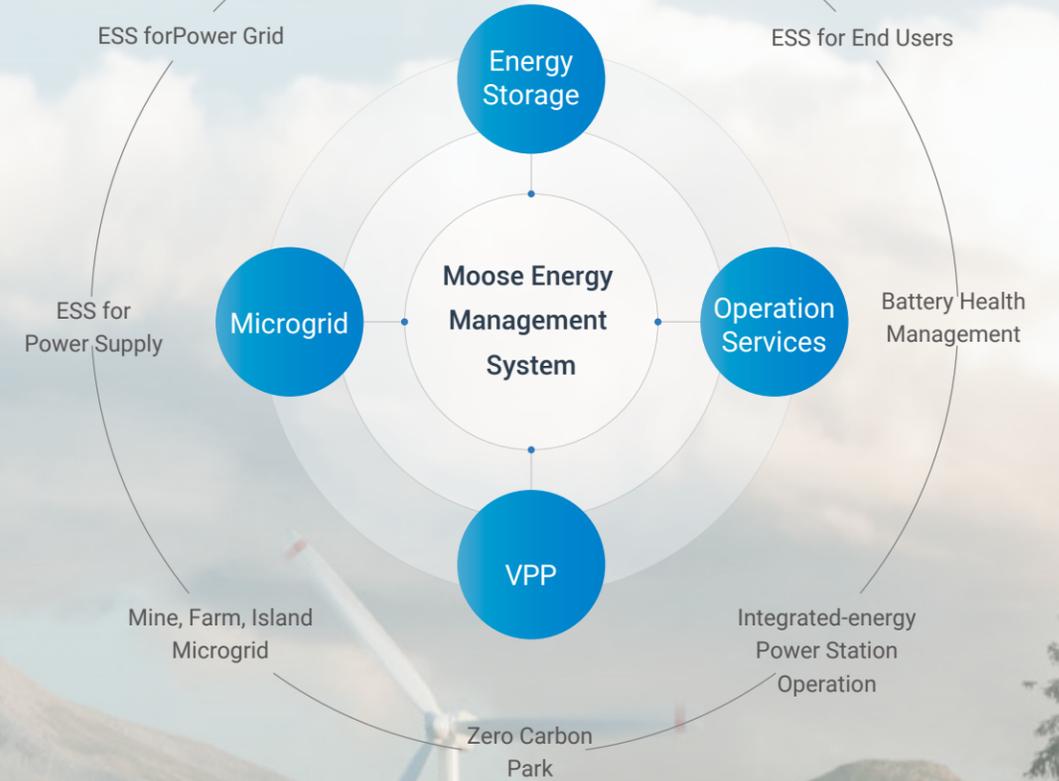


Functional Architecture

Moose Cloud + Moose Cube + System Integration

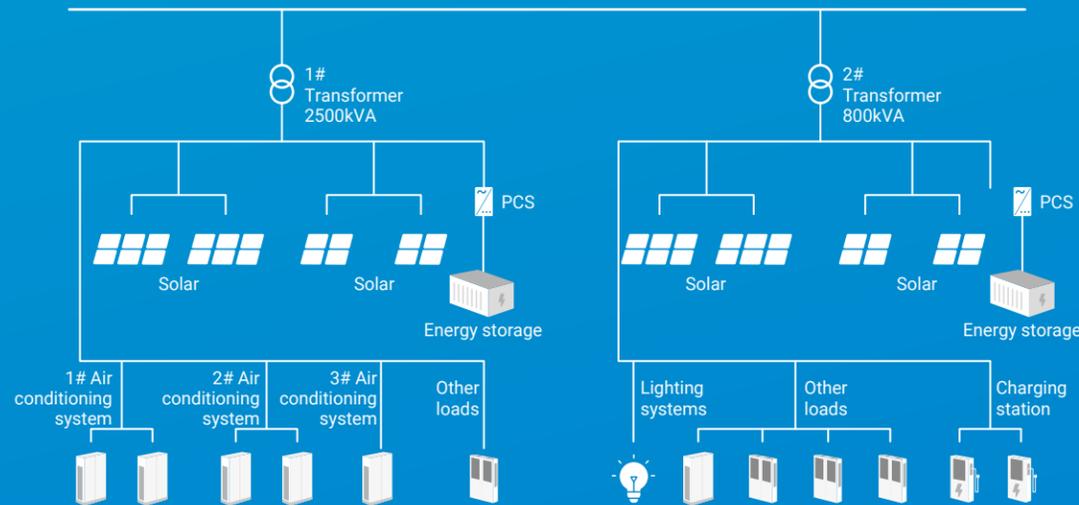


Business Landscape



Cases

01 Xinmei Low-carbon Factory Management Platform Project



Function development of energy management system in the park

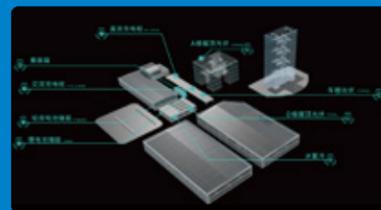
- Self-optimizing Real-time Control
- Integrated Demand Response
- Regulatory Capacity Assessment

Achievements

- Realize self-optimal operation of each distributed subject
- Reducing cost and improving efficiency
- Providing adjustment and responding to scheduling instructions to meet the safe, efficient and clean energy use requirements of the park through interaction.

02 New Energy Micro-grid for State Grid Corporation

PV (333.9kW) + energy storage (145kWh) + DC pile (180kW) + AC charging pile (89kW) + wind turbine (1200kW) + ice storage (2MW)



We provided the client with our Huafon Moose Cloud Platform and operation services. Through our platform control strategy, we have optimized the operating efficiency and economy of the microgrid for customers and improved the customer's digital intelligent low-carbon management capabilities. We have helped customers promote the zero-carbonization of factory energy emissions and transition to low-carbon manufacturing.



70.08MWh Jiangsu, China

Energy management project of Xianghua Cloud Center

This is the largest energy storage project for data centers in China. We provided it with Huafon Moose Cloud Platform and BESS. On the one hand, the peak power consumption of the data center is reduced through peak shaving management. On the other hand, it was used as a backup power source to reduce the configuration of diesel engines to save costs.



370kW / 1.11MWh Shanghai, China

Energy management project of Alibaba data center

We provided Huafon Moose Cloud Platform and BESS for this project. We use peak shaving to reduce the peak power consumption and operating costs of the data center, increasing the income of the data center by 4.85%. After years of operation, through our self-developed battery health management platform, we used the "Dynamic Capacity Balancing Solution" to optimize system capacity and performance without replacing the battery pack.



10MW / 5.6MWh Guangdong, China

Energy storage FM project of Zhaoqing thermal power plant

We provided Huafon Moose Cloud Platform and BESS for this project. By installing energy storage systems in thermal power generation companies, we can provide power grid companies with frequency regulation resources that can quickly respond to power dispatching instructions, ensure more stable operation of thermal power, and improve the efficiency of primary energy use. The operation of the energy storage system will not generate additional CO₂ emissions, helping power generation companies achieve sustainable development.



1.6MW / 3.2MWh Shandong, China

Photovoltaic Energy System of Shandong Power Grid

We provided Smart Energy Management System (SEMS) and PCS for this project. The system has stable and efficient operation control and optimal scheduling capabilities and meets various functional requirements such as new energy consumption, curve tracking, peak shaving, emergency power support, primary frequency regulation, AGC, AVAVC, etc. The system provided customers with a comprehensive power station evaluation index system, and accurately analyzed the production and operation of the power station.