MPMC BEYOND ENERGY | SEMOKii® An MPMC® Brand

CASE STUDY

Micro Grid Hybrid Power Plants

Global Leader in Distributed Solar Hybrid Solutions & Off Grid Systems

Composition of typical hybrid energy power plants

Battery Energy Storage System


Clean Energy


Diesel Power


Auxiliary Equipment

Micro Grid Hybrid Power Plants Project

Sites: Qty. 4
Total Power Installation: 6MW
Each Site: Diesel Generators 2 units of 500kw & 2 units of 250kw

Diesel Generators

Each site equipped with totally 4 units of diesel generators (2 units of 500kw and 2 units of 250kw) as backup power, to coordinate with PV panels and BESS.
All sites connect with SCADA, realizing real energy management, and ensuring maximum fuel efficiency of the diesel generators while supporting the loads.
Excitation after closing, ensuring fast response of backup power during power shortages.

Battery Energy Storage Systems

Each Site: ≥1MWh BESS, 80% DOD, 6000 lifecycles.
Redundant design. DC coupled.
Functions: PQ, VF, VSG, Balck Start, Grid-forming.

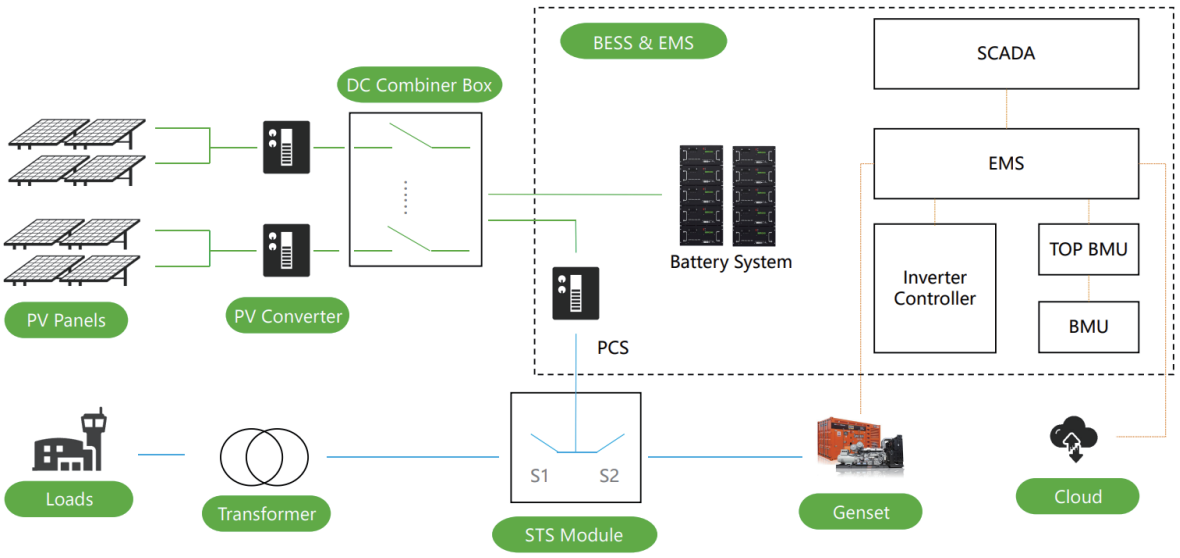
SCADA

Each site can run the SCADA independently and communicate with Master system in real time. StarLink for communication backup.
Realtime data and remote control. Weather forecasting for emergency response.
Smart maintenance management with alarms and records. 10-years data tracking. Reports can be generated to support on-site spare parts management,

PV Panels

Each Site: > 1MWc PV power

System Diagram



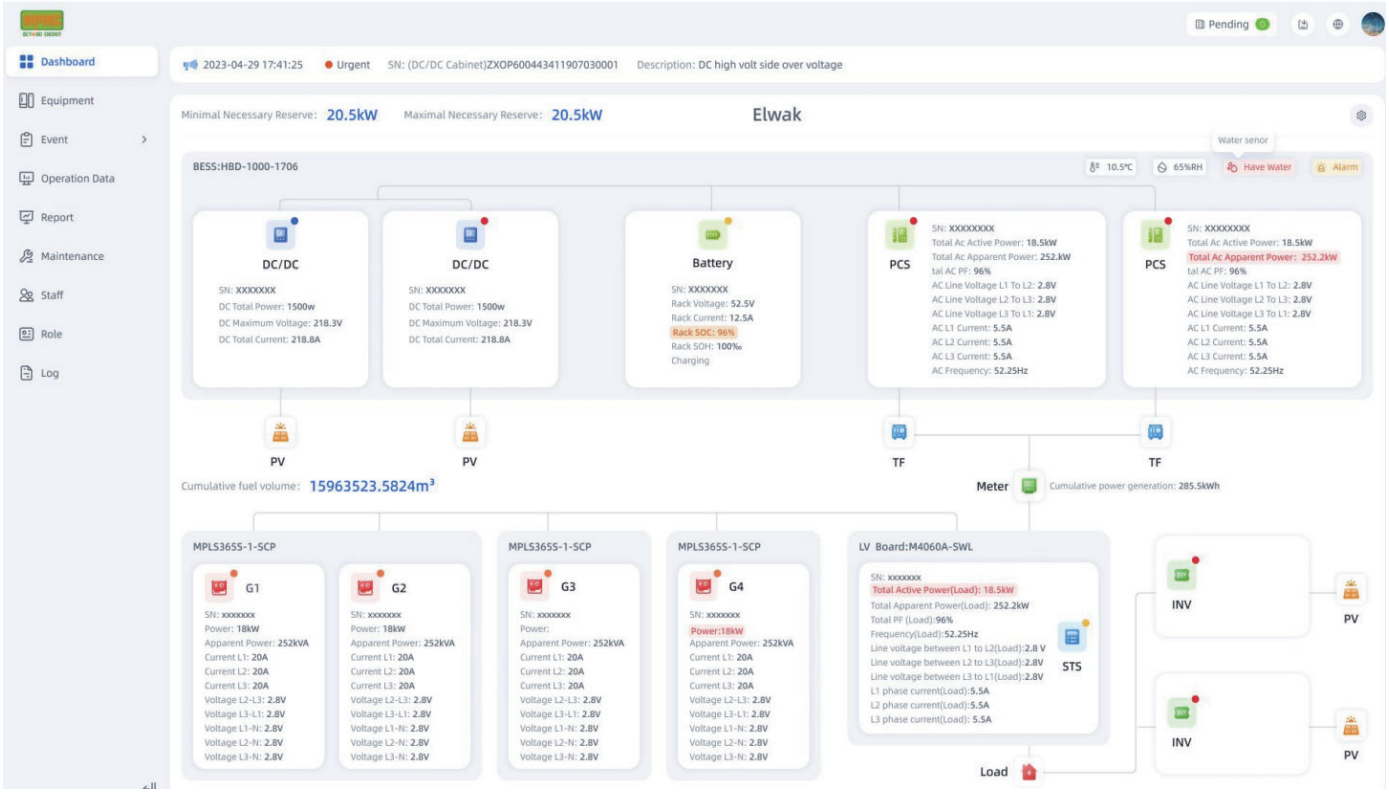
Operation Logic

Basic Design: PV+BESS as prime power, diesel generators as backup power

With EMS and SCADA, the whole power plant realizes intelligent automatic management:
1. Stabilize the power supply by weather analyzing and forecasting, and adjust the power deployment.
2. Analyze and manage the loads, working state of PV and the BESS, to maximize fuel efficiency of diesel generators.
3. Independently and flexibly adjust the operating status and distribution of power generation and loads to maximize the operating efficiency;
4. Have the ability to form a large power grid with other micro grid (HV power grid / LV power grid). Each site can communicate with each other and the master system.

Fuctions of SCADA

MPMC Self-developed SCADA supports realtime remote monitoring and control.Alarms and Faults management and setting of all equipment, history records management etc. Maintenance management: Early warnings and reminders, record tracking, supports warehouse management of on-site spare parts. Monthly reports, Annual reports. Customizable operation reports.SL3 network security. Hierarchical management of accounts. StarLink for communication backup.



SCADA features

	Input fixed value	Meteorological data	Photovoltaic data	Battery data	PCS data	HVAC data	Fireproof system data	Genset data	Other accessories status
Input	Estimated annual peak load; Air conditioner temperature setting; Manual fire sprinkler trigger; Manual switch of equipment	Light intensity; Severe weather warning	Real-time operating data and fault alarms * detail in the communication protocol	Pack/cluster/stack voltage; Pack/cluster/stack current; Pack/cluster temperature; Pack/cluster/stack SOC; Cluster SOH; Protecting pack from: Overvoltage/undervoltage,overcurrent,short circuit,high/low temperature; Protecting cluster from: Overcurrent,overdischarge,high temperature,overcharge; Protecting stack from: overvoltage/undervoltage,overcurrent,short circuit,high/low temperature; Internal Fault detection; Communication Fault detection	Real-time operating data and fault alarms * detail in the communication protocol	Real time power; Real time Temperature; Operating status; Fault alarm	Smoke detection; Temperature check; Operating status; Fault alarm	Real-time operating data and fault alarms * detail in the communication protocol	STS all information in the communication protocol; Opening/closing status and protection alarm of system circuit breaker; Transformer protection alarm; Power environment tracker; Server running status; Oil pump running status; Mailbox liquid level status
Processing Unit	SCADA-Switch-PLC	Switch-PLC/SCADA	Switch-PLC/SCADA-EMS	Switch-PLC/SCADA-EMS	Switch-PLC/SCADA-EMS	Switch-SCADA	Switch-SCADA	Switch-PLC/SCADA-EMS	Switch-SCADA
Output		Light intensity; Severe weather warning	Real-time operating data and fault alarms * detail in the communication protocol	pack/cluster/stack voltage; pack/cluster/stack current; pack/cluster temperature; pack/cluster/stack SOC; Cluster SOH; Protecting pack from: Overvoltage/undervoltage,overcurrent,short circuit,high/low temperature; Protecting cluster from: Overcurrent,overdischarge,high temperature,overcharge; Protecting stack from: overvoltage/undervoltage,overcurrent,short circuit,high/low temperature; Internal Fault detection; Communication Fault detection	Real-time operating data and fault alarms * detail in the communication protocol	Real time power; Real time Temperature; Operating status; Fault alarm	Smoke detection; Temperature check; Operating status; Fault alarm	Real-time operating data and fault alarms * detail in the communication protocol	STS all information in the communication protocol; Opening/closing status and protection alarm of system circuit breaker; Transformer protection alarm; Power environment tracker; Server running status; Oil pump running status; Mailbox liquid level status
Additional settings									







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