30kWh Solar-Wind Hybrid System for Shanghai Villa

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Customer Background: Mr. Li, the owner of a single-family villa in Shanghai, is equipped with a constant-temperature wine cellar, an intelligent fish tank and a central air conditioning system. His annual electricity bill exceeds 50,000 yuan. In 2024, due to frequent typhoons causing multiple power outages, the fish tank creatures suffered heavy losses. Therefore, a 24-hour power cut-off solution was sought.

Customized solution

Capacity selection: 30kWh lithium battery energy storage system (capable of meeting the basic load for more than 8 hours at night);
Energy mix: Highjoule deploys 8kW telescopic photovoltaic panels and 5kW vertical-axis wind turbines on the roof for customers (complementing wind and solar power to make up for the gap on rainy days).

Intelligent management: Connect to the intelligent EMS platform to achieve automatic dispatching of the four sources of photovoltaic, wind power, power grid and energy storage, with charging during off-peak hours and discharging during peak hours.

Customer feedback effectiveness

After installation, it generated 19,000 kilowatt-hours of electricity throughout the year, saving 16,000 yuan in electricity bills. The fish tank was no longer damaged due to power outages. Before the heavy rain, the photovoltaic panels automatically retracted, and there was no need for people to climb the roof anymore!

II. capacity positioning: The term “household” cannot overshadow commercial potential

Although the product is labeled “for household use”, the capacity design of 10 to 30kWh far exceeds the average daily electricity demand of 10 to 20 KWH for an ordinary household, making it more suitable for the following scenarios:

Scene	Typical load	Recommended configuration	Core value
High-end villa	Wine cellar/swimming pool pump/fish tank	20-30kWh	Ensure that luxury equipment is not disconnected from power
Homestay hotel	Air conditioning and hot water system in guest rooms	30kWh+ photovoltaic heating 10-15kWh	24-hour hot water supply and an investment payback period of less than 5 years
Small business	Convenience store freezers/office equipment	10-15kWh	Peak-valley electricity price arbitrage reduces operating costs
Temporary construction site	10kWh of lighting/equipment charging for the work shed + wind power supplementation	10kWh+wind power supplement	Mobile power sources in areas without grid access

Technical explanation: A 30kWh energy storage capacity is equivalent to supporting three 3-horsepower air conditioners to run continuously for 8 hours, far exceeding the basic needs of a household. It is actually a pseudo-home design for small commercial scenarios.

III. Technological Victory: Four Innovative Points to Address Industry Pain Points

1. Wind-solar hybrid: 24-hour stable power supply guarantee

Photovoltaic power generation is the main method (with an average of 4 hours of efficient power generation per day), and wind power is used for energy replenishment at night (it can be started when the wind speed is 3m/s). A customer case of a homestay in Yunnan Province was tested and found that on rainy days, wind power contributed over 40% of the electricity, and the power outage rate in guest rooms was zero.

2. Telescopic photovoltaic panels, flexible space and safe application.

The hybrid power generation system of photovoltaic and wind power, equipped with retractable photovoltaic panels, automatically retracts when encountering strong winds or hail, reducing the damage rate by 90% compared with traditional fixed equipment. Shanghai villa case: The roof area is limited. The telescopic design enables the photovoltaic panel to expand with an efficiency of 17.1%, and when retracted, it only occupies 0.5 square meters.

3. Intelligent Temperature Control: The “Guardian” of Lithium Battery Life

In the hybrid power generation system of photovoltaic and wind power, the capacity of lithium iron phosphate batteries decays by 50% below -10℃. This system adopts: liquid cooling cycle (adaptive to the environment from -30℃ to 50℃). Zoned heating technology (cell temperature difference

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