Key Advantages of Sungrow Batteries

Meeting the Demands of ESS

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Designed for the highest standards: Sungrow Battery Energy Storage Systems

Sungrow is capable of the entire process of battery development, including the definition, design, management of manufacturing, and testing. We have a deep understanding of both batteries and storage systems based on nearly 20 years' research and application of storage, and the cumulative installation of ESS globally. And we always define and lead the development based on the demands of the ESS.

1. The urgent need to redefine energy storage batteries

With the large-scale development of energy storage (it is predicted that the global new installed capacity of energy storage in 2025 (221 GWh) will increase by 18.4 times compared to 2020 (12G Wh)), more application environments (-40°C to 60°C, 5000 meters high altitude, etc.), more complex application scenarios (frequency regulation, peak shaving, black start), and higher grid requirements (millisecondlevel response, short-term overload, etc.) lead to a revolution of ESS. To achieve better performance we need not only a refined system design to control well, but also good batteries specifically tailored to ESS requirements to ensure strong and stable energy supply.

2. Leading the way in creating innovative solutions for large-scale battery storage

Sungrow has been deeply involved in the energy storage field for more than 20 years and has always led the breakthroughs of ESS and promoted the revolution of battery technologies.

NEW

ESS CELL
661 Ah

PowerTitan
3.0

2.1. **SUNGROW BATTERY TECHNOLOGY BREAKTHROUGHS IN ESS**

- **IN 2020,** we increased the system voltage level from 1000 V to 1500 V. This has improved cell consistency (voltage, internal resistance, etc.) by 50%, and increased the DC voltage withstand capacity of the battery cells from 4000 V to 4500 V.
- **In 2021,** we released the industry first liquid cooled ESS, the change from air cooling to liquid cooling in energy storage systems has promoted the design of a multidimensional composite heat dissipation structure for battery cells, greatly reducing the thermal resistance and improving the temperature consistency.
- **In 2023,** we came up with Stem Cell Grid Tech, leading the transformation from grid-following to grid-forming. GFM conditions requires batteries to have an overload capacity of 1.8 times for 15 seconds, supporting the response to various working conditions of the power grid.
- **IN THE SAME YEAR**, we created a new category of AC Block ESS with our PowerTitan2.0, defined the 314 Ah cell to meet the extremely density requirements of DC-AC integrated system based on a 20-foot 5 MWh design.
- Sungrow has been globally introducing a next-generation product in Q2 2025, designed to enhance energy density, extend lifecycle performance, and improve overall system safety. The solution incorporates an advanced 600+ Ah cell dissipation structure that significantly reduces thermal resistance and ensures superior temperature uniformity across battery cells.
- The 600+ Ah cell technology is the same high-capacity technology implemented in the PowerTitan 3.0 platform.

3. Sungrow‘s Technical Layout and Breakthroughs in Cell Technology

3.1. NEARLY 20 YEARS OF TECHNICAL EXPERTISE

Sungrow has specialized in the energy storage industry for nearly two decades, navigating technological transitions from lead-acid to ternary lithium and LFP, thus developing deep expertise in the electrochemical properties of cells. With over 100 GWh of cumulative deployments—ranked No.1 globally—we possess rich experience in cell testing, conditioning, and management, ensuring a profound understanding of ESS requirements for cells. Our interdisciplinary elite team and end-to-end cell R&D capabilities (covering battery material research, structural innovation, safety engineering, and simulation computing) enable full-process development of energy storage cells, from definition and design to production control and quality inspection.

EMC CHAMBER
Safety Verification Capability Test

3.2. MORE THAN 400 PATENTS LEADING THE DEFINITION OF 314 BATTERY CELL

Since 2021, Sungrow has independently developed dedicated energy storage battery cells. In 2022, we launched the prototype of the 314 Ah battery cell (while defining the optimal capacity of the 20-foot 5 MWh system, combined with the system performance requirements, it proposed that the actual capacity of the battery cell should be greater than 320 Ah and the energy efficiency should be >94.5%). In 2023, we jointly achieved mass production with top industry battery cell manufacturers, promoting the large-scale application of the 314 Ah battery cell. We have more than 400 patents for energy storage battery cells, covering multiple dimensions such as structural design, material research, pole piece design, packaging, and state monitoring, achieving fullprocess coverage from R&D and design, production, test to application.

> CONSIDERING THE REQUIREMENTS OF HIGH SAFETY, HIGH RELIABILITY, AND HIGH PERFORMANCE IN SYSTEM APPLICATIONS AND BASED ON THE ABOVE CAPABILITIES IN ESS AND BATTERIES, **WE JOINTLY DEFINE, DESIGN, AND DEVELOP SUNGROW BATTERY WITH THE WORLD’S TOP BATTERY CELL PARTNERS.**
>
> SUNGROW, 2025

3.3. INNOVATIVE DESIGN LEADS HIGH ENERGY DENSITY

For the next-generation large-capacity battery cells, Sungrow defines the 600+ Ah short prismatic battery cell with ultimate energy density. The lamination process is adopted to increase the space utilization rate of the battery cell body by 5%, and the energy density of the cell exceeds 440 Wh/L, reaching the top level in the industry. At the same time, the innovative design of same-side tabs solves the problem of insufficient space utilization in PACK integration (the industry’s common battery cells have top tabs or tabs on different sides, which take up a large amount of space), helping to achieve a higher system energy density.

3.4. INNOVATIVE THERMAL-ELECTRIC SEPARATION DESIGN, LEADING THE ULTIMATE SAFETY OF THE BATTERY AND SYSTEM

Sungrow takes the lead in the design of thermal-electric separation for energy storage battery cells. The battery cell exhaust channels and tabs are distributed on different sides of the battery cell, achieving a complete isolation between the electrical space and the thermal runaway exhaust space (in the industry’s common battery cells, the exhaust channels and tabs are on the same side). With the patented exhaust channel design, the high-temperature or combustible gas released during the thermal runaway of a single battery cell can be quickly discharged, avoiding contact with the tabs of adjacent battery cells, significantly reducing adjacent cell failures., and ensuring the safety of the entire station.

Customer Values of Sungrow Cells

1. 100 GWh+ Capacity, Guaranteed Delivery

Sungrow's partnered cell production capacity exceeds 100 GWh, with flexible factory and capacity allocation. Projects can prioritize factories with sufficient capacity based on scale to ensure on-time delivery for large projects—for example, a 7.8 GWh project was produced and delivered in just 2 months.

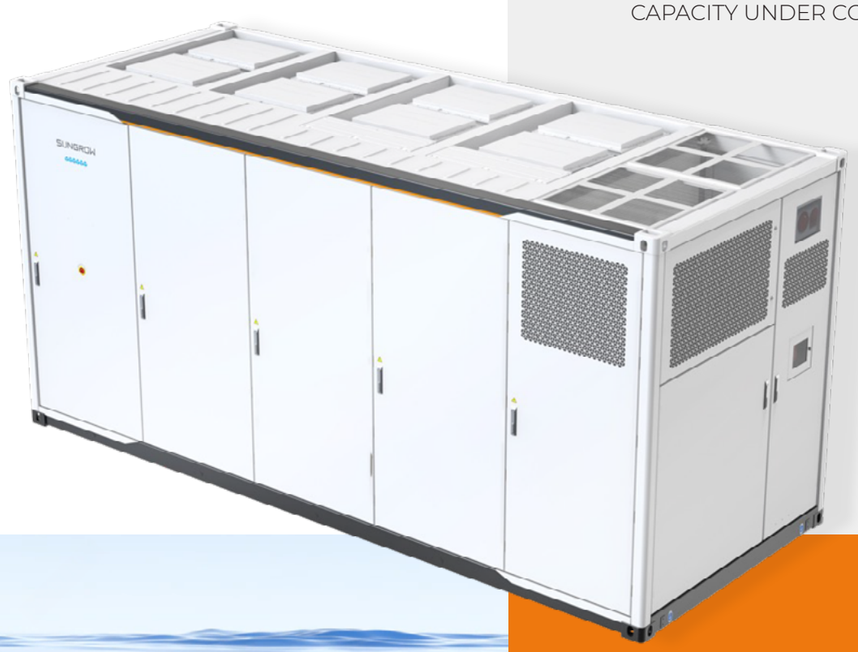
2. Flexible Allocation, Cost Savings

Cells can be flexibly redeployed across projects. Early notice (40 days in advance) of project delays allows waiver of storage fees, saving 20% on delay costs compared to non-Sungrow cells. Flexible production scheduling aligns with project timelines, ensuring fresh cells and reducing calendar aging.

75 GWH ESS

CURRENT PRODUCTION

CAPACITY



35 GWH

CAPACITY UNDER CONSTRUCTION

10 GWH

OF SUNGROW BATTERY CELLS HAVE BEEN SHIPPED TO EUROPE TO DATE (JUNE, 2025).

3. Ample Spares, Efficient O&M

With Sungrow cells, we provide sufficient cell and PACK spares, enabling timely response and flexible dispatch, efficiently addressing O&M needs, accelerating fault recovery, and improving system availability.

4. Stable Supply, Hassle-Free Replacement

Sungrow adopts a long-term approach to cell and system development, ranking highest globally in energy storage bankability. Sungrow cells ensure continuous supply and worry-free system replacement and maintenance throughout the lifecycle.
(Source: Bloomberg NEF)

5. Rigorous Quality Control for GWh-Scale Safety

Sungrow ensures high ex-factory pass rate through strict supplier selection, production process control, and quality inspection. A proprietary testing center further screens cells to achieve 99.99% incoming pass rate. Before system integration, smart warehousing and OCV testing eliminates defective cells. Meanwhile, 24/7 online monitoring during operation ensures a safety failure rate ≤0.1 ppm, suitable for 10 GWh-scale plants and eliminating safety risks from cell failures.

6. One-Stop Shop, One-Stop Service

In traditional projects, cells and other ESS equipment from separate suppliers often cause liability disputes and O&M delays. Sungrow provides end-to-end solutions — from cells to systems — with one-stop services covering installation, O&M, and battery recycling, ensuring clear accountability and efficient after-sales support.

Next-level Storage for your most challenging projects

The capacity of Sungrow Battery Cells have reached global cumulative shipments of more than 100 GWh by August 2025, sucessfully applied in several countries e.g. across Europe, the Americas and China.

Stay connected with Sungrow: **PowerTitan 3.0 with Sungrow's proprietary cells is coming soon.**

Contact Us

www.sungrowpower.com