



Build Your Dreams

BYD Energy Storage System

Efficient, Stable and Safe Storage Solutions for Renewable Energy.



BYD Green Dreams





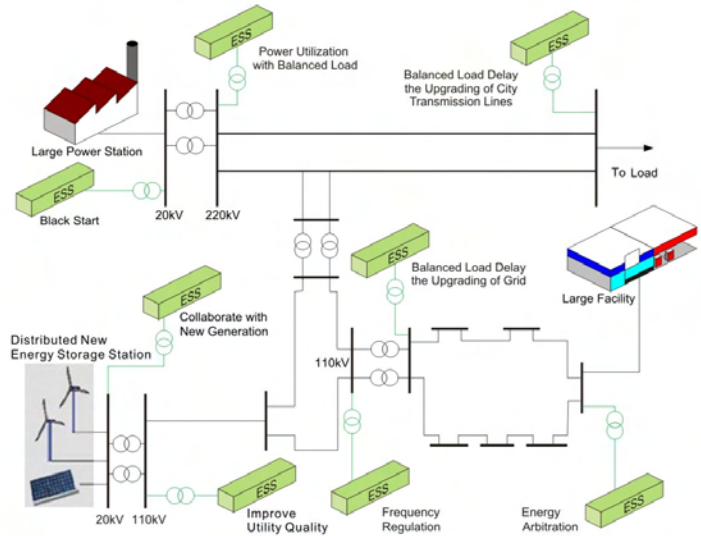
BYD Energy Storage Solutions

Relying on the advanced Fe battery technology, BYD can provide large-scale energy storage systems, distributed energy storage systems and micro-grid systems. Based on these systems, BYD can provide a complete power solution realizing power output smoothing, peaking shaving, frequency regulation, transient active power responding and transient voltage supporting, to keep the power system running safely, stably and reliably. These solutions can be used for frequency regulation, voltage compensation, frequency regulation and power quality management in the power system.

BYD mainly provide Indoor/outdoor two kinds of solutions for on grid using, off grid using and hybrid using. Benefiting from the flexible and modular design, BYD ESS can be fit for various needs. From 2009 to 2013, BYD have finished a lot of successful cases from KW sized to MW sized system on china mainland or abroad.

ESS Application Fields

- New-energy generation
Effectively smoothen the power output to decrease the impact to grid
Generate according to the plan and correct forecast errors
Reduce the peak and fill the valley
Grid frequency modulation with AVC and AGC functions
- Electricity of transmission and distribution
• Smart grid
• Micro-grid
• Reduce the peak and fill the valley
- Special type needs
Military base, smelter, chemical plant, paper mill, airport, wharf and others



Energy Sources Storage

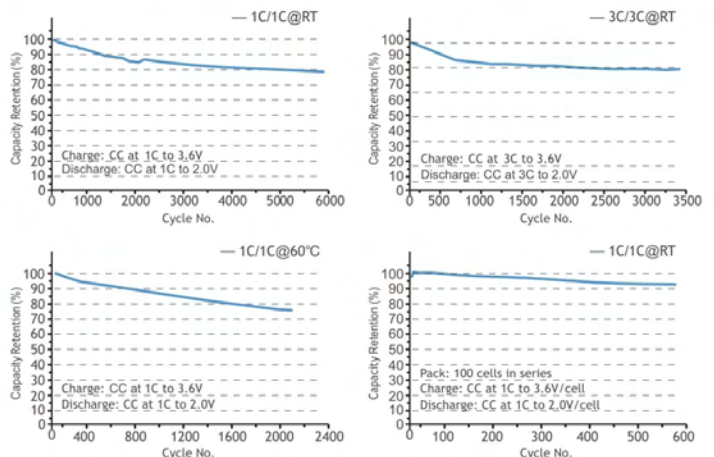
Battery

The high efficiency of BYD energy storage system is ensured by the advanced Fe battery technology and the intelligent Battery Management System. BYD self-developed Fe battery is environmental friendly and has excellent safety performance. Special designed for the BYD battery, the unique technology of BYD BMS can give smart control and protection to the system.

- Long service life
- High power and high efficiency out put
- Low cost and full automatic manufacture process
- High safety



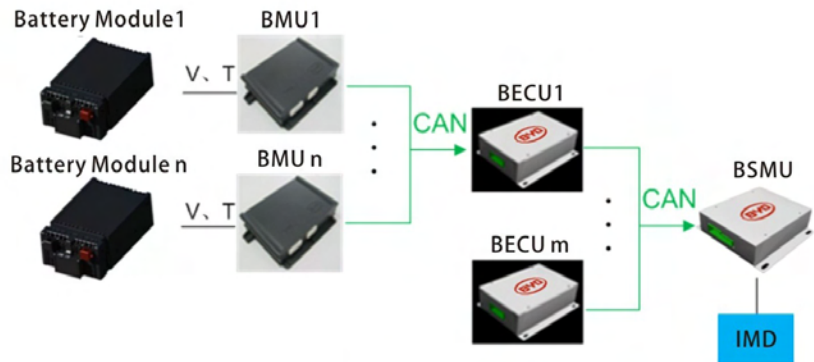
BYD Lithium-ion Iron-Phosphate (Fe) Battery Module Life Cycle Tests



Features of BMS

- Battery status monitoring
- Events record and storage function
- Operation control
- Insulation detection
- Dynamic balancing management
- Protection alarms
- Communication

BMU : Battery Management Unit
 BECU : Battery Electric Controller Unit
 BSMU : Batter System Management Unit



Features of PCS

- Wide-range of DC input voltage
- 10% additional power for continuous operation at ambient temperature up to 40°C
- Short conversion time of full power from charge to discharge
- Indoor or outdoor installation
- Low voltage ride through
- Reactive power adjustable, max. reactive power up to 500kVar
- Active power derating
- Film capacitor design



Fire Protection system

- Automatic fire detecting
- Manual/automatic fire alarming
- Control room and local fire alarm device
- Fault alarm for fire detecting and alarming system
- The accumulator is placed in fire alarming controller. When the main power is off, the accumulator will supply the power to the automatic fire alarming system
- The monitoring function for the open circuit and short circuit in detecting circuit
- The monitoring function for the open circuit and short circuit in alarming circuit



Air Condition System

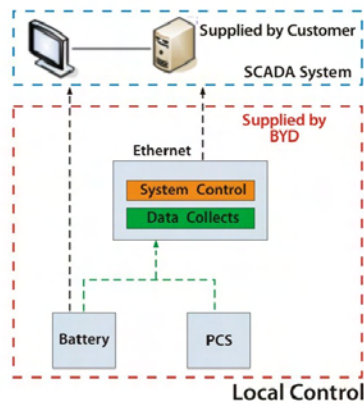
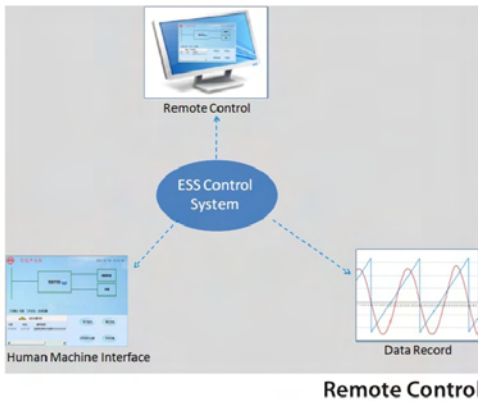
- Power-off memory And Reboot
- Remote fault identification and alarm, and report the fault through RS485
- Use the fuzzy intelligence control for remote communication
- Have the cooling, heating, constant temperature and dehumidifying mode
- Heating control
- Temperature control
- Operation without failure continuous more than 2500hours, Long life, good working performance in harsh environment



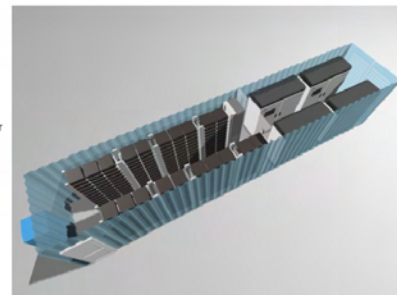
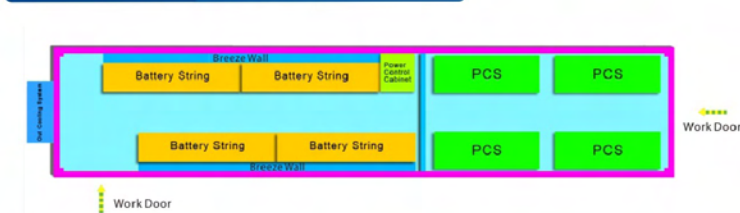
Monitoring System

Energy Storage Control System Function

- Controlling PCS and battery stacks to work together
- Providing local monitoring and control operation interface
- Providing remote monitoring and control operation interface
- Recording and storing important operation parameters as accidents and failure data



Specification



	PCS Power	Battery Capacity	Size
1	250kW	1MWh	40feets Container
2	500kW	1MWh	
3	1MW	1MWh	
4	1.8MW	800kWh	

New Energy Testing Center

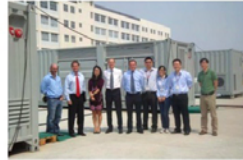
BYD New Energy Testing Center was found on 1st Dec. 2009, it mainly focus on testing and certification for New Energy products.
 BYD New Energy Testing Center had been authorized by UL, VDE, TUV and CSA. We can test and certificate the products by the testing center.





BYD Project Reference

Canada 4MW/2MWh Containerized ESS



System Parameter

System Capacity: 4MW/2MWh
Project Location: Ontario Canada
Completion Time: April, 2014
Owner: RES Canada

Function

Demonstration Project
Peak Shaving
Peak and Frequency Regulation
Power Storage

Italy 1MWh Containerized ESS



System Parameter

System Capacity: 1MWh
Project Location: Italy
Completion Time: April, 2014
Owner: Terna

Function

Frequency Regulation

USA 4MW/2MWh Containerized ESS



System Parameter

System Capacity: 4MW/2MWh
Project Location: Ohio USA
Completion Time: February, 2014
Owner: RES America

Function

Frequency Regulation

Chevron 250kW/500kWh Containerized ESS



System Parameter

System Capacity: 250kW/500kWh
Project Location: Doha Qatar
Completion Time: November, 2012
Owner: Chevron USA

Function

Solar Power Testing
Energy Storage
Solar Output Smoothing
Working On / Off Grid

USA 200kW/500kWh Containerized ESS



System Parameter

System Capacity: 200kW/500kWh
Project Location: Louisiana, USA
Completion Time: August, 2012
Owner: Duke, USA

Function

New Energy Testing
Solar Output Smoothing
Voltage / Frequency Regulation

BYD 200kW/800kWh Containerized ESS



System Parameter

System Capacity: 200kW/800kWh
Project Location: Shenzhen, China
Completion Time: June, 2009
Owner: BYD

Function

Peak Shaving
Power Loads

USA 2MW/4MWh Containerized ESS



System Parameter

System Capacity: 2MW/4MWh
Project Location: San Francisco, USA
Completion Time: September, 2011
Owner: Chevron USA

Function

Used in Micro-grid System
Solar Output Smoothing
Power Loads

Ali Tibet 2MW/5.32MWh ESS



System Parameter

System Capacity: 2MW/5.32MWh
Project Location: Tibet, China
Completion Time: December, 2013
Owner: Longyuan Tibet New Energy Company

Function

Solar and Wind Output Smoothing
Peak Shaving
System Frequency

Build Your Dreams

State Grid 9MW/36MWh ESS



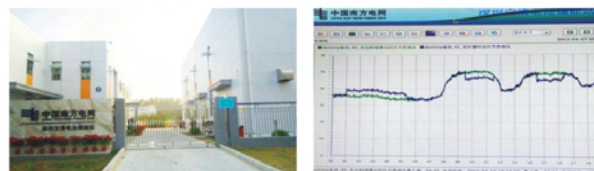
System Parameter

System Capacity: 9MW/36MWh
Project Location: Zhangbei, China
Completion Time: December, 2011
Owner: State Grid

Function

Solar and Wind Output
Smoothing
Peak Shaving
System Frequency

China Southern Power Grid 3MW/12MWh ESS



System Parameter

System Capacity: 3MW/12MWh
Project Location: Shenzhen, China
Completion Time: August, 2011
Owner: China Southern Power Grid

Function

Demonstration Project
Peak Shaving
Peak and Frequency Regulation
Power Storage

BYD 20MW/40MWh ESS



System Parameter

System Capacity: 20MW/40MWh
Project Location: Shenzhen, China
Completion Time: June, 2014
Owner: BYD

Function

System Frequency
Micro Grid

Trial Project of Energy Storage System with High Capacity Batteries of Nuclear Power Station



System Parameter

System Capacity: 2.5MW/3.5MWh
Project Location: Shenzhen, China
Completion Time: Feb.2012
Owner: CGNPC

Function

Emergency Power Supply of
Nuclear Station
Multimachine Parallel Function

State Grid 1MW/1MWh ESS



System Parameter

System Capacity: 1MW/1MWh
Project Location: Zhangbei, China
Completion Time: November, 2010
Owner: State Grid

Function

Wind Output Smoothing

ZhongDian Puri 100kW/400kWh ESS



System Parameter

System Capacity: 100kW/400kWh
Project Location: Zhangbei, China
Completion Time: November, 2011
Owner: ZhongDian Puri

Function

Dual Mode Automatic Seamless
Switch of Grid-tied and Off-grid

About BYD

Established in 1995, BYD is a top high-tech enterprise in China specializing in IT, automobile, and new energy. BYD is the largest supplier of rechargeable batteries in the globe, and has the largest market share for Nickel-cadmium batteries, handset Li-ion batteries, cell-phone chargers and keypads worldwide. It also has the second largest market share for cell-phone shells in the globe. BYD Auto becomes the most innovative independent national auto brand and leads the field of electric vehicles with unique technologies. In the field of new energy, BYD has developed green products such as solar farm, battery energy storage station, electric vehicle, and LED, etc. It will continue to lead the new energy revolution in the world!

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