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LEAD BATTERIES: ENERGY STORAGE CASE STUDY

NR Electric Co Ltd / Tianneng Power International Ltd

# Battery Energy Storage for Grid-Side Power Station

## Huzhou, Zhejiang Province, China

A grid-side power station in Huzhou has become China's first power station utilizing lead-carbon batteries for energy storage.

Starting operation in October 2020, the 12MW power station provides system stability for the Huzhou Changxing Power Grid to enhance the capacity of frequency and voltage regulation.

## Technical Specification

Battery energy storage used for grid-side power stations provides support for the stable operation of regional power grids.

NR Electric Co Ltd installed Tianneng's lead-carbon batteries to provide a reliable energy storage solution for the 12 MW system, to deliver increased resiliency for the power grid and guaranteed emergency power supply for users in the power station.

The storage capacity of the installation is 48 MWh and the system comprises:

- 20,160 lead-carbon batteries in 21 stacks
- Each 2 MWh battery is connected to one 500 kW power conversion system (PCS)
- Four PCS are connected to a 2500kVa booster transformer
- Each battery pack is equipped with a battery management system (BMS) to manage the charge and discharge of the batteries online

The system installed by NR Electric Co Ltd is equipped to provide on-site high/low voltage ride through, fast response speed, grid adaptability, primary frequency and voltage regulation, power quality control and black start.

The system follows US-based EPRI standards and the power dynamic response of the system is less than 30ms, whilst the frequency modulation response accuracy is less than 0.005Hz.

The high-voltage side is 10kV, and the low-voltage side is 380V. The 6MW/24MWh energy storage system is connected to the high-voltage bus at the user side by one parallel point.

The high-voltage side of the 10kV transformer of the three sets of 2MW/8MWh energy storage units is converged to the 10kV switch room, and then the 10kV bus is respectively connected through the 10kV cable line.

## Technical Summary

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| Battery technology | Lead-carbon |
| Battery configuration | 20,160 batteries in 21 stacks |
| Plant power | 12 MW |
| Storage capacity | 48 MWh |
| Plant design life | 20 years |

## About the Company – NR Electric

NR Electric, as a power stability expert, is dedicated to all around solutions for electric power generation, transmission, and distribution.

With more than twenty years of experience and high-tech innovations, NR Electric provides a wide range of electrical and power electronics solution to its worldwide customers.

## About the company - Tianneng

Tianneng Power International Limited is a leading enterprise in the industry of new energy power battery in China, founded in 1986.

Tianneng's batteries are used for wind power and solar power storage and the company offers the recycling and cyclic utilization of waste batteries, the construction of smart microgrids in cities, as well as the building of green and smart industrial parks.

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