



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Technical standard for rural solid waste collection
transportation and treatment**

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1 General

1.0.1 This standard is formulated to standardize the design of wind-solar-storage combined power stations and promote the comprehensive utilization of renewable energy.

1.0.2 This standard is applicable to the design of the following combined power plants for grid-connected new construction, reconstruction and expansion with a power generation installed capacity of 10MW and above.

1 Wind power generation, photovoltaic power generation, electrochemical energy storage combined power station;

2 Combined wind power generation and electrochemical energy storage power station;

3 Photovoltaic power generation, electrochemical energy storage combined power station.

1.0.3 The design of wind-solar-storage combined power station should be based on the conditions of wind energy resources, solar energy resources and grid access conditions.

1.0.4 The design of the wind-solar-storage combined power station shall not only comply with this standard, but also comply with the current relevant national standards.

2.0.1 wind/PV/storage power plant wind/PV/storage power plant

The combined power station formed by the combination of wind power generation, photovoltaic power generation and electrochemical energy storage is divided into wind power generation, photovoltaic power generation, electrochemical energy storage combined power station, wind power generation, electrochemical energy storage combined power station, photovoltaic power generation, electrochemical energy storage Energy storage combined power station.

2.0.2 wind turbine generator system (WTGS)

A system that converts the kinetic energy of wind into electrical energy.

2.0.3 wind farm; wind power plant

A power station consisting of a batch of wind turbines or groups of wind turbines, unit

transformers, collection lines, main step-up transformers and other equipment.

2.0.4 photovoltaic (PV) module

The smallest indivisible solar cell combination device with encapsulation and internal connection, which can provide DC output alone, is also called solar cell module.

2.0.5 Photovoltaic(PV) modules string

In a photovoltaic power generation system, several photovoltaic modules are connected in series to form a circuit unit with a certain DC output.

2.0.6 photovoltaic (PV) power unit

In a photovoltaic power station, a certain number of photovoltaic module strings are collected through a DC combiner box, and then boosted by an inverter and an isolation step-up transformer into a power supply that meets the frequency and voltage requirements of the grid, also known as a unit power generation module.

2.0.7 Photovoltaic(PV) array

Several photovoltaic modules are mechanically and electrically assembled in a certain way, and a DC power generation unit with a fixed support structure, also known as a photovoltaic array.

2.0.8 photovoltaic (PV) power generation system

A power generation system that directly converts solar radiation energy into electrical energy by using the photovoltaic effect of solar cells.

2.0.9 photovoltaic (PV) power station

A power station mainly based on photovoltaic power generation systems, including buildings (structures) and auxiliary facilities such as maintenance, maintenance, and living.

2.0.10 smooth the output fluctuation of wind/photovoltaic

Through the adjustment of the energy storage system, the active power of the grid-connected output can meet the fluctuation rate within a given period of time less than the set value.

2.0.11 track scheduled output

Through the adjustment of the energy storage system, it meets the requirements of tracking the output curve of the wind-solar-storage combined power station issued by the power grid dispatching department.

2.0.12 peak load shifting

Through the adjustment of the energy storage system, the load is charged during the low load period and discharged during the peak load period, thereby realizing the temporal and spatial translation of the load.

2.0.13 collector line

It is divided into photovoltaic power station collector lines and wind farm collector lines. The power collection line of a photovoltaic power station refers to the transmission line that collects and transmits the AC power after the inversion and boost of each power generation unit to the substation in a photovoltaic power generation system with decentralized inverter and centralized grid connection; the power collection line of a wind farm refers to The power transmission line that collects and transmits the boosted electric energy of each wind turbine to the substation.

2.0.14 point of common coupling (PCC)

The connection of more than one customer in the grid.

2.0.15 Point of coupling (POC)

For a wind-solar-storage combined power station with a substation, it refers to the high-voltage side busbar or node of the substation; for a wind-solar-storage combined power station without a substation, it refers to the output aggregation point of the wind-solar-storage combined power station.

2.0.16 low voltage ride through low voltage ride through

When the power system failure or disturbance causes the voltage drop of the grid-connected point of the wind-solar-storage combined power station, within a certain voltage drop range and time interval, the wind-solar-storage combined power station guarantees continuous operation without going off the grid.

2.0.17 High voltage ride through high voltage ride through

When the grid accident or disturbance causes the voltage of the wind-solar-storage combined power station to rise, within the specified voltage increase range and time interval, the wind-solar-storage combined power station can guarantee continuous operation without going off the grid.

2.0.18 Maximum power point tracking (MPPT)

The tracking control of the voltage and current changes of the photovoltaic array output keeps the DC output power of the photovoltaic array near the maximum power point, and

the automatic adjustment function of the photovoltaic module to play the best performance.

2.0.19 solar time

The solar time angle is used as the standard timekeeping system, and the true solar time is zero hour when the center of the sun is in the upper climax of the place.

2.0.20 Electrochemical energy storage station

A power station that uses electrochemical cells as energy storage components for storage, conversion and release.

2.0.21 energy storage unit energy storage unit

The smallest energy storage system consisting of a battery pack, a battery management system and a power conversion system connected to it.

2.0.22 rated power of converter

The maximum power continuously and stably output by the converter under the rated voltage, current and environmental conditions is regarded as the rated power of the converter, that is, the rated power of the energy storage system.

2.0.23 Coordination monitoring and control system of combined power station monitoring system

A monitoring system for coordinated control of wind power, photovoltaic, energy storage sub-systems and substations in wind-solar-storage combined power stations.

3 basic rules

3.0.1 Wind-solar-storage combined power station should be designed according to regional overall planning, wind energy resources, solar energy resources and land resources, power system conditions, installation and transportation and other factors, to meet the requirements of safety, reliability, economical applicability, environmental protection, aesthetics, and easy installation and maintenance requirements.

3.0.2 The wind-solar-storage combined power station design should adopt new technologies, new processes, new equipment and new materials while satisfying safety and reliability.

3.0.3 The design of wind-solar-storage combined power station should adhere to the principle of saving resources and comprehensively considering social and economic benefits, proceed from the overall situation, make overall plans, and combine short-term and long-term.