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**Electricity spot market operation - Part 5: Calculation method of
incorporating intermittent new energy into power system
balance**

电力现货市场运营 第5部分：新能源参与电力平衡计算方法

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is Part 5 of GB/T 45905 "Electricity Spot Market Operation". GB/T 45905 has been published in the following parts.

- Part 1: Terminology;
- Part 2: Provincial technical support system;
- Part 3: Inter-provincial technical support system;
- Part 4: Load forecasting;
- Part 5: Calculation method for new energy participation in power balance;
- Part 6: Frequency modulation capacity management;
- Part 7: Spare capacity management;
- Part 8: Multi-cycle power and quantity balance calculation method;
- Part 9: Market power monitoring and mitigation;
- Part 10: Operational evaluation.

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

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Introduction

In order to further implement the national decision-making arrangements for deepening power system reform and accelerating the construction of a new power system, and to support the high-quality development of the power spot market, This series of standard.

GB/T 45905 "Electricity Spot Market Operation" covers terminology, provincial technical support system, inter-provincial technical support system, load forecasting, new energy Power balance calculation method for power source participation, frequency regulation capacity management, reserve capacity management, multi-cycle power balance calculation method, operation evaluation, etc.

GB/T 45905 is planned to consist of 10 parts.

- Part 1: Terminology. The purpose is to standardize the terms and definitions related to electricity spot market operation and grid operation, to provide a standardized and high-level Provide guidance for the effective construction and operation of electricity spot markets.

- Part 2: Provincial technical support system. The purpose is to standardize the system architecture, functional requirements, performance of the provincial technical support system requirements, data interaction, reliability assurance, security protection and other technical requirements, as a provincial technical support system design, development, construction and Basis for operation.
- Part 3: Inter-provincial technical support system. The purpose is to standardize the system architecture, functional requirements, performance of the inter-provincial technical support system requirements, data interaction, reliability assurance, security protection and other technical requirements, as the provincial technical support system design, development, construction and Basis for operation.
- Part 4: Load Forecasting. The purpose is to specify the basic technical requirements for load forecasting in the electricity spot market, which is used to guide the Market operators, business entities and power grid companies carry out short-term and ultra-short-term system load forecasting, bus load forecasting and Household load forecasting.
- Part 5: Calculation method for new energy participating in power balance. The purpose is to standardize the power spot market environment, wind power, photovoltaic power, etc.

Principles, calculation methods and basic data requirements for the participation of new energy in electricity balance at different scales.

- Part 6: Frequency Regulation Capacity Management. The purpose is to standardize the overall requirements and calculation methods for frequency regulation capacity setting in the spot market, clarify Determine the frequency regulation capacity evaluation and adjustment methods, improve the standardization of the frequency regulation market and the compliance operation level of the spot market, and guide provincial/regional The power grid carries out frequency regulation capacity management.
- Part 7: Spare capacity management. The purpose is to standardize spare capacity configuration, spare capacity mutual assistance, spare capacity recovery and other requirements.

Provide guidance to provincial/regional power grids on reserve capacity management.

- Part 8: Multi-cycle power and quantity balance calculation method. The purpose is to specify the basic requirements for multi-cycle power and quantity balance calculation.

The requirements, data requirements, calculation methods and conclusion analysis are used to guide provincial and above power grids in dispatching production organization and spot market operation.

Carry out multi-cycle (year, month, week, day) power and electricity balance work during the process.

- Part 9: Market power monitoring and mitigation. The purpose is to standardize the

monitoring methods and mitigation of market power in provincial/regional electricity spot markets.

Mitigation measures provide guidance for market power monitoring and mitigation.

- Part 10.Operational evaluation. The purpose is to standardize the evaluation requirements, evaluation indicators, and evaluation of provincial/regional electricity spot market operations.

The evaluation methods are used to provide guidance for the operation evaluation of the electricity spot market.

Electricity spot market operations Part 5: Calculation method for new energy sources participating in power balance

1 Scope

This document specifies the basic data sources for wind power, photovoltaic power and other new energy sources to participate in power balance at different time scales in the electricity spot market environment.

Requirements for data sources, data processing methods and calculation methods.

This document is applicable to the calculation of reliable power generation capacity of power grids at the provincial level and above, which include wind power, photovoltaic and other new energy output into power balance, Analysis and calculation of supply margin, determination of unit combination and verification of transaction balance, etc.

2 Normative references

GB/T 45905.1

3 Terms and Definitions

The definitions of terms in GB/T 45905.1 apply to this document.

4 General Requirements

4.1 The participation of new energy in medium- and long-term and short-term power balance should be determined based on the fluctuation characteristics of new energy power generation and the statistical laws of new energy power generation.

Determine the reliable power generation capacity of new energy as the safety boundary for new energy to participate in power balance.

4.2 If there is an effective and available forecast output of new energy, the calculation method for participating in the short-term power balance should be used; if there is no