

# Study on the Comprehensive Marketization Reform of New Energy Grid Electricity Prices

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## Abstract

In February 2025, relevant departments in China jointly issued a notice proposing a comprehensive market-oriented reform of future new energy grid electricity prices, which has a significant impact on the development of new energy projects. The preliminary analysis has three main impacts: firstly, it will reduce the wind power grid price, which will affect the project investment return. Secondly, when conducting feasibility analysis of project investment, it is difficult to estimate the on grid electricity price of the project, which affects the accuracy of project economic analysis. Thirdly, major power generation companies will slow down their pace of acquiring new energy projects and lower their acquisition prices.

## Keywords

New Energy Generation; Feed-in Tariff; Market-oriented Reform; Mechanism Electricity Price.

## 1. Core of Reform

The Notice emphasizes that the on grid electricity of new energy projects (including wind and solar power generation) should generally enter the electricity market, and the on grid electricity price should be formed through market transactions<sup>222</sup>[1]. After new energy participates in electricity market trading, a mechanism for price difference settlement shall be established outside the market. The level of new energy electricity price included in the mechanism (hereinafter referred to as mechanism electricity price), the scale of electricity consumption and the implementation period shall be clarified by the local energy regulatory department in the future. For the electricity included in the mechanism, the price difference will be compensated when the average market transaction price is lower than the mechanism electricity price, and the price difference will be deducted when it is higher than the mechanism electricity price. The settlement cost of the price difference will be included in the local system operating expenses, and the expected profits of the enterprise will be stabilized through the method of "refunding more and compensating less".

Among them, the mechanism electricity price is classified and set for existing and incremental projects. The mechanism electricity price for existing projects is properly aligned with current policies, while the mechanism electricity price for incremental projects is determined through market-based bidding. The specific differences are as follows:

### 1.1. Existing Projects (Put into Operation before June 1, 2025)

The proportion of electricity generated by the execution mechanism for existing projects shall be independently determined annually within the scope of scale, but shall not be higher than the previous year. The mechanism electricity price should be properly aligned with current policies, but should not exceed the local coal electricity benchmark price.

## 1.2. Incremental Project (Put into Operation from June 1, 2025)

The amount of electricity applied for inclusion in the mechanism for a single incremental project may be appropriately lower than its total power generation. The mechanism electricity price is formed by voluntary bidding of projects that have been put into operation and will be put into operation within the next 12 months. In addition, these projects have not been included in the scope of mechanism implementation which is organized by various regions every year. During bidding, the selected projects are determined from low to high according to the quotation. The mechanism electricity price is generally determined based on the highest quotation of the selected projects, but shall not exceed the bidding upper limit.

## 2. International Experience Reference

This Notice to some extent draws on the models and methods of European countries in the field of Contracts for Difference (CFD), such as the UK's Contract for Difference (CfD), Denmark's Variable Price Subsidies and the EU's two-way CFD[2]. Referring to and learning from the electricity price implementation mechanisms of these countries and the electricity market situation after their implementation, it has certain enlightening significance for the layout and development of new energy engineering construction units in China. Taking the Contract for Difference (CfD) implemented in the UK since 2014 as an example, after the implementation of CfD, the market prices of new energy generation in various regions of the UK have shown different trends[3].

### 2.1. Southeast Region of England

The electricity demand in this region is high, but the transmission line capacity is limited. When the amount of low-carbon energy generation increases significantly, it is difficult to transport a large amount of electricity from the north and electricity prices rise sharply. During periods of low electricity consumption or high renewable energy generation, supply exceeds demand, market electricity prices may even drop to negative. Overall, the market electricity prices in the region show clear peaks and valleys with valleys reaching negative values.

### 2.2. Scotland Region

The region has abundant wind power resources. During periods of good wind resources, power generation increases significantly, market electricity prices decrease and even negative electricity prices occur. When wind power output is insufficient or electricity demand is peak, market electricity prices increase. Overall, there are peaks and valleys in the market electricity prices in this region which may reach negative values. But the overall frequency and magnitude of fluctuations are different from those in the southeast of England.

### 2.3. Remote Areas

The power grid infrastructure in remote areas is relatively weak and the connection with the main power grid is limited. New energy power generation projects face high transmission costs and access difficulties. When renewable energy generation is large, it is difficult to timely deliver electricity to other regions, then result in a significant decrease in local market electricity prices or even negative electricity prices[4]. When there is a shortage of power generation, it relies on other regions for power supply, then result in relatively high market electricity prices and more volatile fluctuations. Overall, the market electricity prices in remote areas have very obvious peaks and valleys which are often negative and fluctuate irregularly.

### 2.4. Industrial Concentration Zone

The electricity demand in industrial concentration areas is relatively stable and high. In addition to meeting local demand, new energy generation can also be transmitted to other

regions and is relatively less affected by changes in market supply and demand[5]. Overall, although there are slight peaks and valleys in the market electricity prices of industrial concentration areas, they are relatively stable.

In summary, after the implementation of CfD, there have been fluctuations in the market electricity prices for new energy generation in various regions of the UK. After comparison, the stability is shown as follows: industrial concentration zone>Scotland>southeastern England>remote areas. Although there are varying degrees of peaks and valleys in the actual market electricity prices in different regions, the implemented electricity prices set in various parts of the UK are basically stable. The difference between the market electricity prices and the implemented electricity prices (similar to the mechanism electricity prices proposed in the Notice) is generally controlled within a certain range of electricity prices. From this, it can be seen that implementing electricity prices can effectively alleviate extreme fluctuations and to some extent ensure the basic income of enterprises.

### **3. Prediction of Future Trends in New Energy Generation**

Based on the wind power trading data of various provinces in China in 2024, combined with the electricity price trends in different regions after the introduction of the UK Contract for Difference (CfD), it is predicted that the future trend of wind power market electricity prices in different regions of China may exhibit the following characteristics:

#### **3.1. Eastern Coastal and Economically Developed Regions**

##### **3.1.1. Increased Short-term Volatility**

The installed capacity of new energy in these regions is growing rapidly, but the growth rate of electricity demand is slowing down. Coupled with the low electricity consumption during holidays, there may be local negative electricity prices in the spot market (such as the frequent occurrence of negative electricity prices during Shandong's "May Day" period in 2024). But with the compensation effect of the price difference settlement mechanism, the fluctuation of actual returns will be partially alleviated.

##### **3.1.2. Medium - to Long Term Stabilization**

Through mechanisms such as green electricity trading and carbon markets, the green value of new energy will be further highlighted. For example, the demand for green electricity in Zhejiang enterprises is strong and the proportion of green electricity transactions in some enterprises will exceed 90% in 2024 which will support the long-term stability of electricity prices.

#### **3.2. New Energy Enrichment Regions in Northwest and North China**

##### **3.2.1. High Pressure of Low Price Competition**

These regions have a high proportion of new energy installed capacity (such as over 50% of wind and solar installed capacity in the northwest region), but their local consumption capacity is limited and insufficient cross provincial transmission channels may lead to sustained low electricity spot prices. After the full marketization of new energy generation in 2025, incremental projects will determine the mechanism electricity price through bidding or further lower the overall electricity price level.

##### **3.2.2. Transmission of Consumption Costs**

If the new energy generation exceeds the system's regulation capacity (such as the penetration rate of new energy in Gansu reaching 70%), the system balance cost may be shared among industrial and commercial users through a price difference settlement mechanism, indirectly pushing up the terminal electricity price.

### 3.3. Key Areas of Distributed Photovoltaics in the Middle East

After the implementation of the reform, the revenue structure of new energy power generation has been further optimized. Previously, distributed photovoltaics faced the challenge of grid connection in the "red zone". The new policy explicitly prohibits the use of distribution and storage as a prerequisite for grid connection and proposes to optimize cost allocation through market mechanisms. For example, some distributed projects in Henan can increase their returns through the peak valley price difference in the spot market.

## 4. Countermeasures and Suggestions

This reform forces new energy projects to improve efficiency and competitiveness through market-oriented pricing mechanisms. At the same time, it balances the interests of new and old projects through price difference settlement mechanisms and classified policies. In summary, new energy generation entities can consider the following five aspects:

Firstly, prioritize internal system resources and strive to sign long-term power supply agreements with major base factories through direct purchase or supply of electricity to lock in revenue and obtain stable income.

Secondly, after the new energy project is put into operation, a professional trading team should be promptly deployed to respond to market risks. Optimize pricing strategies based on changes in supply and demand, allocate electricity reasonably to different markets and reduce the risk of revenue fluctuations.

Thirdly, timely grasp policy dynamics, track provincial implementation plans, pay attention to the completion of regional consumption responsibility weights and dynamically adjust project application strategies.

Fourthly, we should lay out diversified revenue models, explore new areas such as participating in green electricity trading and carbon markets. In addition, broaden revenue channels.

Fifthly, strengthen cost control and reduce costs through technological innovation, equipment updates and renovations to enhance competitiveness.

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