



## Factsheets Series on China Energy Transition Updates

# MARKETS ARE PLAYING AN INCREASING ROLE IN CHINA'S ENERGY SYSTEM

### China aims to build a unified national power market by 2030

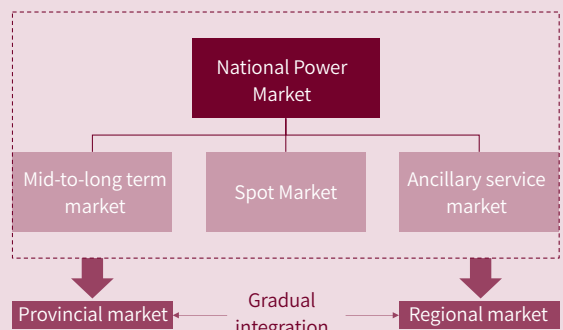
The 14th Five-Year Plan for Modern Energy System (2021-2025) states that markets shall play a vital role in resource allocation and distribution.<sup>1</sup> The trading volume in the power market has grown steadily over the last five years. In 2022, 60% of the electricity consumption were already through market-oriented transactions,<sup>2</sup> the mid-to-long term and ancillary service markets have achieved full coverage, and six spot pilot areas have entered into long-term uninterrupted settlement trial operation.

In January 2022, the National Development and Reform Commission and National Energy Administration set out a plan for China to establish a preliminary national power market by 2025 and a final, unified design is to be implemented by 2030.<sup>3</sup> The national power market will be a multi-layer system with national, provincial, and regional power markets operating together. This setup will allow closer-to-real-time and more cross-provincial trading. According to Prof. Yuan Jiahai from North China Electric Power University, the national power market "would allow power to be traded across the nation in a system similar to that of Europe and not be subject to the territorial barriers under the current operation of the China Southern Power Grid and China State Grid."<sup>4</sup>

The national power market will be designed to promote the investment, generation, trading, and consumption of new energy sources. The policy encourages new energy generators to sign mid-to-long term contracts with longer periods and to participate in the spot market. The document also encourages decentralised power generators to trade with nearby power users. For reliability, the government also intends to explore capacity guarantees and investment in energy balancing capabilities, such as pumped hydro, energy storage and virtual power plants (VPPs).



### China plans to establish a unified nationwide power market



Source: Qin Yan, 2023

## Mid-to-long term contract and intra-provincial trading still dominates power markets in China

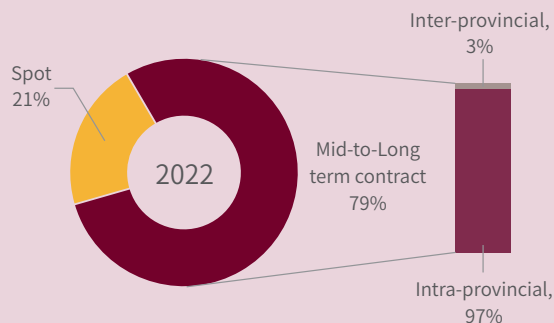
Unlike other countries, China established the MLT market first to hedge possible risks and stabilize power prices. The first provincial spot market pilots were launched in 2019, with some of them operating continuously until now. However, by the end of 2022, the trading volume in the spot market remained low, only 21% of the electricity were traded in the spot market.

Higher generation from variable renewables also brought greater fluctuations into the market. The Shandong electricity spot market has seen negative prices for 22 consecutive hours during the national holiday in May 2023. The spot power price fluctuated drastically between 1047.51 RMB/MWh and -85 RMB/MWh. The combination of reduced demand due to the holiday break and an excess supply of renewable energy were the main factors contributing to the occurrence of negative spot prices.

Improving local interconnections and inter-provincial trading will help resolve the problem as the load curve is smoother for a greater geographic region. Right now, intra-provincial trading still dominates total power trading with a 97% share in 2022. This is due to various reasons, including provincial protectionism as well as the lagging behind in the construction of transmission corridors.



### Mid-to-long term contracts still dominate the power trading market



Source: China Electricity Council, 2023

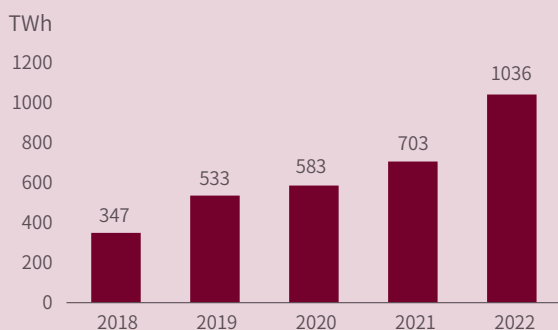
## Green power trading increased significantly in 2022 but still accounted only for a small amount in total power trading

China launched its green power trading market in September 2021. After the phase out of re-newable subsidy, new wind and solar projects are expected to trade in the power market and benefit from their zero marginal cost. However, the trading volume of green power in 2022 is only 22.78 TWh which is just equal to 0.4% of total power trading. The installed capacity and generation volume of non-subsidised new energy projects remains low compared to the total installation and generation.<sup>5</sup> The installed capacity of non-subsidised wind and solar projects are 103 GW and 109 GW respectively in 2022 (around 30% of the total installed capacity of wind and solar). However, according to BNEF's prediction, the annual additional generation of non-subsidised wind and solar projects will reach only 130 to 140 GWh.

To expand the scope of the green power trading market, NDRC, MoF and NEA jointly issued a policy to encourage subsidised renewable projects to trade in the market in February 2023.<sup>6</sup> Previously, subsidised wind and solar could participate in the market only on a voluntary basis. It is expected that this move will considerably increase the trading volume of green power in the near future.



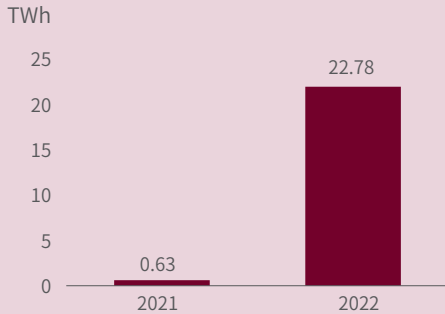
### The trading volume in the power market has grown steadily over the last five years.



Source: China Electricity Council, 2023



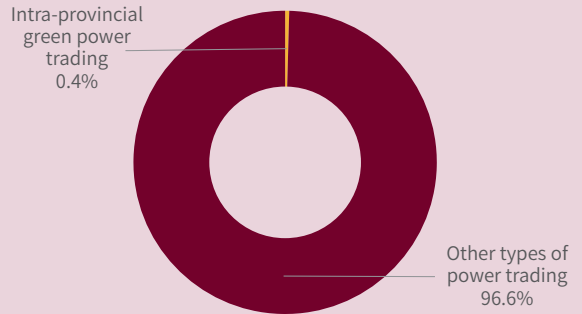
### Green power trading volume increased significantly in 2022



Source: China Electricity Council, 2023



### Green power trading still takes a small part in total power trading



Source: China Electricity Council 2023, and GIZ analysis, June 2023

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## About us

The Sino-German Energy Transition Project, as a component of the Sino-German Energy Partnership, commissioned by the German Federal Ministry of Economy and Climate Protection (BMWK) and supported by the National Energy Administration of China (NEA), focuses on sharing German experiences with the energy transition and providing advice to the Chinese government and associated energy policy think tanks. In addition, valuable input from the Chinese partners will refine German practices and offer a different perspective on current and future approaches. To carry out the project, The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, the German Energy Agency (dena) and Agora Energiewende collaborate with the China Electric Power Planning and Engineering Institute (EPPEI), China Southern Power Grid (CSG), and the Institute for Applied Ecology at the Chinese Academy of Sciences (IAE).

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## **Document 9 on Deepening Power Sector Reform**

establishes long-term goals of market pricing of electricity, spot markets, and opening up market for retail electricity

**2015**

**2016**

### **Rule 625**

mandates purchase of all renewable energy and compensation for curtailed energy by grid companies.

### **Rules for market-based mid-to-long term contracts**

to gradually replace administratively-planned dispatch

**2017**

**Ancillary services reforms begin  
Seven spot market pilots announced**

**T&D pricing reform implemented nationally**

**2019**

**New spot market pilot guidance issued by NEA**

**New Mandatory Purchase requirement for Renewable Energy issued**

**NDRC and NEA issued the basic rules for mid-to-long-term power purchasing agreement**

**2020**

### **New inter-provincial spot trading rules issued**

Which now allows spot trading between provinces.

### **Schedule for further power marketisation**

NDRC required commercial and industry (C&I) power users as well as coal power plants to enter the market gradually.

### **Plan for an integrated national power market**

NDRC and NEA defined the framework of a national electricity market and the transition process by 2025 and 2030.

**2022**