China power sector reform and power trading - an overview of recent policies and trends

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European power system is highly connected

Liberalized power markets enable resources to be utilized in a wider area
Efficient power market and grid can help renewables deployment in China

On 23 September when Northern China experienced power shortages and near 10 GW supply gap, the grid was still exporting 4.5 GWh/h electricity to Hebei/Shandong province due to rigid long-term power contracts.

Wind

Solar

Wind installed capacity as of Sep 2021, and share of provincial fleet

Solar installed capacity as of Sep 2021, and share of provincial fleet

Source: National Renewables integration and monitoring center
China’s power sector reform speeded up this October: ...triggered by power shortages in late September, but it is a long process in the making too.
Key highlights of the October 2021 Coal-fired tariff reform

It not only covers coal-fired tariff, but also fundamentally changes the role of grid company

- **Market-based:** 44% of total power consumption
- **Mid-to-long term trading**

1. **Widening** the Coal-fired benchmark tariff fluctuation band to ±20% (from ±15%, 0.35-0.6 CNY/kWh)
   - *Energy-intensive industry not subject to this limit*
   - *Spot trading not subject to this limit*
2. **All** of coal-fired power generation into market (70% to 100%)
3. **All** of industrial & commercial users into market (43% to 100%)
4. Residential and agricultural users’ tariff **unchanged**

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**Gamechanger**

All of industrial & commercial users will now buy electricity from the market, direct or via Grid companies
So this changes the role of Grid companies

‘**Power price can rise or decrease’**

Source: China Electricity Council
The energy regulators have put forward policies facilitating the reform

Comprehensive policy framework to build ‘new power system’ fulfilling the climate targets

‘Time of use’ electricity price

• Peak, Valley, Critical Peak

Cross provincial spot trading rules

• Covers both UHV and provinces in same regional grid
• All types of generation (not only RE)

Draft national spot power trading rules

• In internal consultation until late November

Forthcoming

‘Opinions’ approved at 24 Nov Meeting of Central Commission for Comprehensively Deepening Reform

• ‘Opinions on speeding up the establishment of national electricity market system’
The October power tariff reform rolled out quickly in provinces
In Nov, 29 provinces officially implemented the new rules, over 10 have put more than 50% rise in tariff for energy-intensive industry

Sichuan province's Nov-Dec thermal power trading, cleared at ~700 CNY/MWh (€90) for electrolysis aluminium producers, +75% from coal power benchmark tariff.

Source: BJX news, Sichuan power exchange
China has 8 provincial spot power trading pilots since 2017, 5 more since March 2021
Southern (Guangdong), Inner Mongolia (west), Zhejiang, Shanxi, Shandong, Fujian, Sichuan, Gansu

Second batch (5, since March 2021): Liaoning, Jiangsu, Anhui, Henan, Shanghai
• Explore regional spot power markets in Beijing+Tianjin+Hebei, and Southern provinces

Goals:
- Continuous spot trading by end of 2021

Status:
- Only Shanxi with continuous spot trading from July
- Dec. 2021: Zhejiang, Shandong
Guangdong’s new spot market test run in November

Rather high clearing prices reflected the surging coal prices this year

In Nov. test run, Guangdong introduced “dynamic upper limit” of coal/gas generators’ bidding prices*

Qinhuangdao thermal coal
API2 front month
Zhengzhou coal futures

*The first trading week of November used coal price of 1418 CNY/tonne (last available CECI index) + freight 66.6 CNY/tonne to calculate coal generators’ fuel cost + o&m etc. Upper limit is then 1.5 * generators’ cost
Renewables participating power trading: Shanxi province

Lack of derivates market for risk management, Duck curve/cannibalization

- Continuous spot trading since July
- Clearing price as high as 1500 CNY in July
- Spot price plunged in early November

\[ \text{CNY/MWh} \]

WHY? On 3 November, Wind+ Solar > 50% of total load

Source: Xiangnenghui News, Shanxi Power Exchange
• China power sector reform **speeded up** after 6 years
• It is triggered by power shortages, but fundamentally driven by **climate goals**
• Many supporting policies have been long in the making, aiming to fully transform the power market and build up ‘**New power system with renewables as the mainstay**’

• Optimistic, but nationwide (price zones?) spot market **unlikely before 2030**
Thank you!

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