

# Just the FAQs

## Understanding the Chinese Spot Power Market

22 September 2023

### Contact for this FAQ:

**David Fishman**

Senior Manager

dfishman@lantaugroup.com

+86 185 1619 4400

In September 2023, China's government released a new planning document describing its plans to establish a national unified power market with spot power trading. This is a major undertaking, and a huge step forward for power market liberalisation in China, deserving the close attention of all Chinese power market stakeholders. It will also have important knock-on effects for China's long-term decarbonisation efforts. In recognition of its significance, we present this Just the FAQs: Spot Market Edition.

### First, What is a "Spot Power Market"?

**ANSWER:** A spot power market is a market where short-term electricity supply may be bought and sold between power generators and power buyers. In China, spot market products include 1) the day-ahead market, where power trading is organised to arrange power supply for the next day; 2) the intra-day market, where adjustments are made on a rolling basis to maintain supply throughout the day; and 3) the real-time market, where real-time load balancing can be guaranteed in intervals as short as 15 minutes. Power prices in the spot market reflect immediate or short-term conditions of supply and demand and will respond rapidly if they change, for instance, a power plant tripping offline, or a bunch of customers turning on their AC at the same time.

Generally, most of the power consumed by customers is traded via mid- or long-term contracts, while spot power markets are used to complement and fill in the gaps caused by unexpected variations in supply or demand on a short-term basis.

Some countries develop a power spot market first, and then add long-term products later, using the pricing data from the spot market to inform long-term power contract pricing (i.e. the mid-/long-term market, or MLT market). China has proceeded in the reverse, first creating a stable MLT power market, and only adding spot trading in more recent years.

### What are the Benefits of a Power Spot Market? Why Should A Country Try to Create One?

**ANSWER:** In a well-functioning spot market, power prices reflect the time-value of power such that power prices are higher during periods that supply is tighter, and lower in periods of freer supply, ensuring real-time balancing and more economic efficiency.

Compared to power that is traded in the MLT market, which uses financial contracts negotiated and settled months or even years before the power is actually generated and consumed, the spot market is driven by real-time physical supply and demand. The market creates price signals based on real-time supply tightness, specific to location and time, that help power users optimise their power consumption and tell generators what kind of power generation strategy is most profitable.

## What are the Drawbacks of a Spot Market?

**ANSWER:** Spot markets are complex to establish and maintain. When some aspect of a power spot market goes badly due to poor design or mismanagement, the risks of negative outcomes like power undersupply or loss-making operations are high. Developing a functioning spot market not only requires the physical infrastructure, digital infrastructure, and sophisticated rules for using that infrastructure, but it requires the market participants to have a high degree of sophistication and proficiency with power trading. In China, generators will no longer be able to count on guaranteed offtake from the grid company, nor can customers count on a fixed tariff “menu” of power supply options, reducing cost certainty for participants.

The biggest challenge created by a spot market is the same feature that made it attractive: its prices will faithfully reflect real supply and demand conditions, even to a fault, which becomes obvious during periods of severe oversupply or undersupply. Both sky-high power prices and extremely cheap power prices may be the outcome of a spot market working exactly as it's supposed to. Naturally, customers will be unimpressed by very expensive tariffs, while generators will be unenthused by very cheap tariffs. Spot market design must be navigated and executed thoughtfully.

The ideal end-state is for the invisible hand of the Chinese spot market to discover the “true” value of power at different times of the day, improving utilisation of grid network resources and enhancing energy security.

## What is the Status of Chinese Spot Market Development?

**ANSWER:** China launched its first round of spot market pilots back in 2017, intending for the pilot provinces to accumulate trading experience and establish best practices that could be shared to more provinces. Later, a second and third batch of provinces were selected to implement pilot spot markets. Some pilot provinces have achieved relatively mature operations, for instance, Guangdong, which has been operating its spot market continuously since 2021. The majority of spot market trading that has taken place so far has been intra-provincial, although some limited-basis interprovincial spot market trading has been operating since December 2022.

The last 6 years of provincial spot market pilot operation revealed many areas for improvement to be incorporated into future market designs. A few issues identified included: Fujian's market not adequately reflecting the true cost of power, Gansu's market having an overly narrow allowed price clearing range, Shanxi's market unable to effectively allocate congestion management costs to market participants, and Shandong's market returning excessively low prices during the day, among others.

## What Comes Next in China's Spot Market Development?

**ANSWER:** In an important document released in September 2023, the NDRC and NEA laid out their guidelines for integrating spot market trading into the national unified market, which would enable interprovincial spot trading, a huge milestone. This national unified market concept is currently piloting in the China Southern Grid region, while the unified market in the State Grid region will run its pilot from 2025-2030. This document lays out the early-stage planning for continuous spot market trading, on the foundation of the national unified power market. The ideal end-state is for the invisible hand of the Chinese spot market to discover the “true” value of power at different times of the day, improving utilisation of grid network resources and enhancing energy security.

This document's period of effect is for the next three years, from Oct 2023 to Oct 2026, but is only intended to serve as a high-level 'guidebook' for how the central government envisions the development of the spot market. The actual trading rules that govern the trading will be announced later by provincial policymakers. Tasks to be completed over this period include:

- Perfect the function of provincial day-ahead, intra-day and real-time markets, while establishing inter-provincial and inter-regional spot market trading;
- Strengthen the price signal connections between the mid-/long-term markets and the spot market;
- Strengthen the price signal connections between the spot market and the ancillary services market, especially reserve capacity; and
- Promote the inclusion of renewables in the power market, including distributed generators, load aggregators, VPPs, and battery storage.

## What are the Implications for Power Generators?

**ANSWER:** Generators have already been facing tough challenges to adapt to an increasingly marketised offtake regime, which the spot market makes even harder. Now, generation companies must nurture a sales team to find customers via mid-/long-term markets AND a short-term trading team to bid into the spot markets. These are more demanding skillsets than simply signing an offtake agreement with the grid or negotiating a long-term power purchase agreement with a power customer. In the short term, both SOEs and IPPs will begin a scramble to hire experienced traders, or else cultivate them internally via trial-and-error training.

Aside from investing in their human resources, generators might also need to procure market forecasting software, develop an internal bidding strategy, and conduct research into local and regional power market conditions.

For renewable generators specifically, the qualifications and experience needed to trade in the spot market can be a challenge. Renewable output is variable in nature and traders need to be able to use powerful weather forecasting models to accurately gauge their hourly output and assess fluctuations in loads. This is particularly relevant for solar generators, where cloud cover can materially and rapidly impact generation rates. Renewables traders also need to be able to balance how much power they sell via mid-long-term contracts and how much can be sold into the spot market, where the risk of price volatility is higher. Successful traders will see significant revenue hikes with a good trading strategy; unsuccessful traders will lose a lot of money.

## What are the Implications for Power Users?

**ANSWER:** The development of a spot market is an opportunity for large, wholesale power customers, who will be incentivised to develop their own power trading team to procure power. Just like the generators, they can optimise their costs by betting money at the right time and place, buying more power when prices are low and reducing loads (if possible) when prices are high. Just like on the generator side, experienced traders will see better results, while inexperienced traders could end up overpaying for power (or get slapped with deviation penalties).

On the other hand, end-users in the retail power market will be more passive price takers of the spot market's volatility because they don't trade power directly. Of course, they have a retail power vendor supplying their power, and so it will be their retailer's responsibility to manage power procurement in the spot market (with their own team of power traders). The extent to which price variations in the spot market are passed on from power retailer to power end-user will depend on the terms of their supply contract. Overall, however, we expect medium-term power contracts in the wholesale market would begin benchmarking against the spot market, which will contribute to more monthly tariff variability on the retail end.

## About the Authors:

**Miaosu Li** is a consultant at The Lantau Group who specialises in researching and analysing regional energy markets in mainland China and Taiwan. Her experience includes commercial due diligence of renewable power assets, energy cost analysis and forecasts for large end-users, power market reform analysis, market fundamental analysis, support in PPA intermediate services, power tariff modelling (Taiwan), as well as civil nuclear certification and market development advisory for western companies (China mainland).

**Anna Leung** is a consultant at The Lantau Group with a diverse background in business and law. Her experience in the energy sector includes renewable energy and sustainability policy; renewable energy sector analysis; and power market development and trading rules. She has worked across the region with a particular recent focus on power trading and green power purchase agreement transactions and structures for commercial and industrial customers in Mainland China and Taiwan.

**David Fishman** is a senior manager at The Lantau Group with 9 years of experience in the Chinese power sector, covering nuclear, coal, solar, wind storage, and grid infrastructure. At TLG, he focuses on our transactional and commercial due diligence work for energy developers, lenders, and financiers looking to buy, sell, or invest in Mainland China energy assets. His work in China also involves supporting MNCs with their evaluation and execution of their long-term power strategies, including evaluation and procurement of low-carbon power and renewable energy certificates. David is based out of the TLG office in Shanghai, serving the needs of our customers across Mainland China.

## What are the Implications for China's Long-term Decarbonisation Goals?

**ANSWER:** The time granularity of spot markets is a good match for renewable generation, which are variable and intermittent by nature. Establishing spot power trading in a single unified power market will allow generators in oversupplied regions to find offtakers for their surplus generation in other parts of the country in real-time, reducing curtailment and improving revenue for renewable traders. Of course, when supply exceeds demand, the offtake prices in the spot market could be very low, which creates offtake price risk exposure for renewables developers.

Additionally, enabling renewable resources from around the country to reach load centres cost-effectively and efficiently via a spot market could shrink the need for reserve capacity in those areas, which means the backup coal-fired capacity can be limited (or drawn down). Besides coal, all inefficient or expensive generators will face financial pressure, as they would theoretically be in direct competition for dispatch against cheaper or cleaner generation from anywhere in the country.

## About The Lantau Group

The Lantau Group (TLG) provides strategy and economic consulting services focused on the Asia Pacific's energy, network, and infrastructure sectors. We are the region's largest group of its kind. We offer a unique in-house resource pool equipped with experience and expertise in economic, commercial, financial and strategic aspects of the region's fuel-to-power value chain. We provide our clients with economic and regulatory consulting services, transaction support, asset valuation, and assistance in the development and evaluation of business strategy. Our clients include leading multinational corporations, industry organizations, investor-owned utilities, generators, power pools, transmission companies, distribution companies, gas businesses, electricity and gas retailers, large power users, industry regulators and governments. Our detailed understanding and insights into each major market within the Asia Pacific region are distinctive core competencies. Our access is unparalleled through our offices in Singapore, Hong Kong, Korea, Mainland China, Australia, Thailand, Malaysia, Vietnam, India and with team members and affiliates across the world.

### Disclaimer:

This brief has been prepared for general information only. It does not constitute consulting advice, cannot be relied on, and should not be acted on without professional advice. If you have questions or require further information regarding matters covered in the newsletter or related matters, please contact the author or your regular TLG advisor. This material may be considered advertising.

## Anything Else Important to Note About This New Spot Market Guideline Document?

**ANSWER:** Embedded in this document were two interesting sections seemingly with less relevance for spot markets, but important enough to highlight here:

- **Capacity Markets:** Provincial markets are encouraged to explore setting up capacity markets to incentivise investment in all types of backup generation resources. This will potentially provide a lifeline for coal-fired power plants in the future, which are seeing diminished utilisation hours and increasingly being treated as backup/peaking supply. Over a long run, the capacity market will supplement the activity of the mid-/long-term and spot power markets, but could also be made obsolete once the national unified power market with spot trading is mature.
- **Power Market Exit:** In the previous power trading regime, it was possible for a power customer to exit the power market and suffer a 150% punitive tariff to go back to procuring power from the grid company. According to a rule update slipped into this most recent document, this option is no longer available. Under the new rules, an end user can only exit the market if it is liquidated, is no longer using power, or physically cannot use power due to policy changes or grid infrastructure limitations. Any power customers exiting the market without an acceptable reason will be banned from re-entering for 3 years. This policy change ensures that once a power buyer swaps direct grid supply for the power market, it can never go back.

Bangkok | Delhi | Hanoi | Hong Kong | Kuala Lumpur | Melbourne and Perth Seoul | Shanghai | Singapore