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# The Indian Express

27/06/2024

## Power markets in India: their working, advantages, and the road ahead

The government has allowed the trading of surplus electricity generated from “linkage coal” in the country's power markets amid increasing demand this summer.

To meet **peak power demand** during the unusually hot summer, the government has allowed the trading of surplus electricity generated from “linkage coal” in the country's power markets.

Coal linkages are typically made by the government to thermal units against long-term power purchase agreements (PPAs) with distribution companies (discoms). Power markets offer a flexible, reliable, and transparent alternative to PPAs, enabling generators to respond swiftly to demand fluctuations and sell surplus power at market-determined prices.

### PPAs and power markets

To sell their electricity, generation units in India have traditionally used long-term PPAs that typically span 25 years. These agreements commit generators to supply power to buyers, usually public utilities, at fixed rates. PPAs are gradually

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losing favour due to their inflexibility in adapting to dynamic market conditions, and their tendency to lock in significant generating capacity.

Power markets, on the other hand, allow generators to respond to short-term demand fluctuations and sell surplus power independently of PPAs at market prices. The flexibility is particularly beneficial for generators of renewable energy, who may produce excess power during the off-peak hours. Instead of curtailing generation, the surplus can be traded on the market.

Price-based demand response involves multiple parties, and typically results in greater reliability and transparency in trading compared to bilateral contracts. This market-driven approach enables generators to optimise their output and revenue, while helping utilities meet variable power demands more efficiently.

### **How power markets work**

Buyers make bids for the purchase of electricity, and sellers make offers. The market clearing price — the price at which electricity is traded — is determined by the equilibrium of demand bids and supply offers.

Power markets are categorised on the basis of electricity delivery timing and duration of contract.

The spot market includes the real-time market (RTM) for near-immediate delivery and the intraday market for same-day trades hours before delivery.

Contract markets, on the other hand, facilitate longer-term trades.

The day-ahead market (DAM) deals with closed auctions for 15-minute time blocks for the following day, while the term-ahead market (TAM) handles trades from 3 hours to 11 days in advance.

The renewable energy certificates (REC) mechanism allows utilities to meet renewable purchase obligations (RPOs) by buying RECs, each representing 1 MWh of renewable electricity. This system benefits states that lack sufficient renewable capacity, and enables them to purchase RECs for green energy generated elsewhere.

Utilities that exceed RPO targets can trade extra RECs to allow other utilities to meet their targets.

## Power exchanges in India

Power markets are hosted on a power exchange. Exchanges facilitate competitive pricing, improved resource allocation, and greater market liquidity in the power sector.

Power exchanges were first introduced in Europe in 1990-91, and they now operate in about 50 countries around the world. The Electricity Act of 2003 established the framework for exchange operations in India, and exchanges commenced in 2008.

The spot market was introduced in 2020, which further enhanced the flexibility and responsiveness of the power trading system.

India has three major power exchanges regulated by the Central Electricity Regulatory Commission (CERC), where generators, utilities, and large consumers trade electricity. The Indian Energy Exchange Ltd (IEX) dominates with more than 90% market share, followed by Power Exchange India Limited (PXIL) and Hindustan Power Exchange Ltd (HPX).

In FY 2023-24, IEX traded about 110 billion units (BU) of electricity, growing 14% year-on-year. This represents almost 7% of India's total power demand, which reached 1,626 BU in FY24. The government has recently amended various regulations to encourage and incentivise participation in power exchanges, reflecting their growing importance in India's electricity market.

## Road ahead for exchanges

Indian regulators are exploring market coupling and capacity markets as the next evolutionary step for the country's power markets.

Market coupling is a process that matches bids from all power exchanges to discover a uniform market clearing price, which also acts as a reliable reference price for policymakers. The concept, first introduced in CERC's Power Market Regulations, 2021, could lead to more efficient price discovery, reduced price disparities across regions, and increased market stability.

Capacity markets, on the other hand, would allow generators to be paid for their available capacity, not just for the electricity they produce. This mechanism is aimed at ensuring long-term grid reliability by incentivising investment in

generation capacity, particularly for peaking power plants that may not run frequently but are crucial during high-demand periods.

Only a few countries, including the United Kingdom, parts of Australia, and South Korea, have developed capacity markets. The introduction of these advanced market structures would align India's power markets more closely with mature international markets, potentially attracting more investment and fostering greater competition in the sector.





# Vocabulary

## 1. Swiftly

**Synonyms:** quickly, rapidly, speedily, promptly, briskly

**Antonyms:** slowly, sluggishly, leisurely, tardily, unhurriedly

## 2. Gradually

**Synonyms:** slowly, progressively, incrementally

**Antonyms:** suddenly, abruptly, immediately

## 3. Renewable

**Synonyms:** sustainable, inexhaustible, restorable

**Antonyms:** non-renewable, finite, exhaustible

## 4. Curtailing

**Synonyms:** reducing, limiting, restricting

**Antonyms:** expanding, increasing, extending

## 5. Optimise

**Synonyms:** improve, enhance, refine

**Antonyms:** worsen, degrade, hinder

## 6. Efficiently

**Synonyms:** Effectively, competently, productively

**Antonyms:** Ineffectively, inefficiently, ineffectively



7. Amended

**Synonyms:** revised, modified, corrected, adjusted

**Antonyms:** unchanged, unaltered, original, unchanged

8. Incentivise

**Synonyms:** motivate, encourage, stimulate

**Antonyms:** discourage, deter

9. Coupling

**Synonyms:** connection, linking, junction

**Antonyms:** decoupling, separation

10. Evolutionary

**Synonyms:** developmental, progressive, advancing

**Antonyms:** regressive, stagnant

11. Disparities

**Synonyms:** Differences, inequalities

**Antonyms:** Similarities, equality

12. Fostering

**Synonyms:** nurturing, promoting

**Antonyms:** hindering, discouraging

