



IEX BULLETIN



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“As India marches towards achieving its net zero targets, there is bound to be a much larger involvement of exchange platforms in the country’s energy landscape.”



Message from the **Chairman and MD's** Desk

Dear Friends,

As we begin yet another year in our journey, it is my pleasure to extend my heartfelt wishes to you and your loved ones for a peaceful, prosperous, and healthy year ahead. The year gone has been a momentous one, for the nation, power sector and all its stakeholders.

On the economic front, the Indian economy grew at 7.2% in the first nine months of the calendar year 2023 which led to increase in power demand at an unprecedented rate of 7.9% YoY. Even on the fuel side, coal availability during the year improved, as compared to the year 2022. India's coal production increased by 12% YoY in 2023 to reach close to 1 billion tonnes during the calendar year.

During the year, the sector received valuable support from the Government and Regulators. Several regulatory and policy reforms continued as part of the Government's thrust towards establishing a sustainable and energy efficient India, and further deepening power markets. Most notable among these measures has been the implementation of the General Network Access (GNA), the Indian Electricity Grid Code (IEGC), the Inter-State Transmission Charges Regulations, and operationalisation of the Green Open Access Rules. To improve availability of sell in the market, Government has directed generators with PPAs to offer URS power on the day ahead market and the real time market on Exchanges. All these regulations also stand to facilitate energy transition by providing flexibility to thermal generators, introduction of RE aggregators, and grid connectivity even for RE capacity of 50 MW. Renewable Generation Obligations (RGO) now mandate new coal or lignite-based thermal plants to establish RE capacity of a minimum of 40% of a plant's capacity. Among other important things, Inter State Transmission (ISTS) charges have been waived off for RE to reduce the cost of integration of renewables. Going forward, all these Regulations will increase the share of Exchanges in the overall power

generated in the country, through improvement in sell side liquidity. This in turn will lead to further optimization of power costs of Discoms and C&I consumers by procuring via Exchanges.

As India marches towards achieving its net zero targets, there is bound to be a much larger involvement of Exchange platforms in the country's energy landscape. Earlier in 2023, the expert group constituted by the Ministry of Power for 'Development of Electricity Market in India' charted out a road map for deepening the power market and accelerating smooth integration of renewable energy into the grid. The Group has recognised the inefficiency and inflexibility of long-term PPAs and a stronger role of Power Exchanges to enable efficiency in electricity procurement. Renewable integration will also necessitate detailed resource adequacy planning by the utilities to ensure optimum resource mix and introduction of capacity contracting through Power Exchanges. According to the report, additional RE capacity would be developed through mechanisms such as the Contract for Difference and Virtual PPA. Improving the efficacy of Day Ahead market will lead to a merit order dispatch of electricity, which will result in effective cost optimisation. Further, the report also includes the proposal to introduce financial products for electricity to hedge against price volatility in spot markets which will lead to further deepening of power markets.

On our part, over the years, IEX has been a dedicated partner in the nation's energy transition. With technology

“ The road ahead for the power sector as well as Exchanges is replete with exciting opportunities. India is acknowledged as the fastest growing major economy of the world, well on track to become a 5 trillion-dollar economy within this decade. Power markets will serve as a catalyst for accelerating this economic and energy transition. ”

and innovation at the core, we have been at the forefront of introducing new products and market segments, with the support of all our stakeholders. Our state-of-the-art and best-in-class Exchange technology has ensured social welfare maximization by helping discover the most efficient price. The Real Time Market, and Green Markets are set to enable India towards a sustainable and energy efficient future. We are set to further strengthen our product portfolio by extending our Long Duration Contracts (LDC) from three to 11 months, post-regulatory approval. As we look to the future, we are committed to introducing innovative products and market segments.

The year gone by was a memorable one for the company as we celebrated 15 years in the dynamic landscape of India's power sector, transforming it, and setting benchmarks, with the support of all our stakeholders. With an aim to create a pool of skilled professionals for capacity building in the power market, we launched the IEX Academy in June and in a short span had nearly 250 enrolments. Further, we launched India's first electricity price index – 'PowerX' - to provide competitive benchmark signals and enable market participants to make more effective decisions.

Technological innovations and customer-centricity remain at the core of IEX's operations. During the year, we launched EnergX, a comprehensive anytime-anywhere, web-based bidding platform across all our electricity segments, to provide a seamless experience to our customers. EnergX enables automated bidding through API, market data insights for effective bidding decisions, easy financial reconciliation, digital client registration, and web-based access to trade reports. Additionally, we have deployed best-in-class cyber and data security solutions to ensure robust and secure operations through our platform. Our 24x7 Security Operating Center ensures risk free trading experience for our customers. Further, we undertook process automations to ensure better systems availability and ease of operations. We will continue to be at the forefront of adopting new technologies and innovate to harness opportunities provided by a sustainable energy future.

The road ahead for the power sector as well as Exchanges is replete with exciting opportunities. India is acknowledged as the fastest growing major economy of the world, well on track to become a 5 trillion-dollar economy within this decade. Power markets will serve as a catalyst for accelerating this economic and energy transition. The government's thrust on green energy banking solutions, such as pumped storage, battery, hydrogen etc., will lead to the development of new products and markets. Further, as solutions such as energy storage gain size and scale, the share of renewable power will certainly be more than that from fossil resources in the coming years. As an exchange, IEX keeps exploring ways to leverage these prospects and explore synergies for effective growth and diversification to cater to India's changing energy mix and growing energy demand.

I would like to reiterate our commitment to build an efficient energy marketplace with technology and innovation at the core. This journey of transforming India's power markets could not have been possible without the vision of the Government and Regulators and the guidance of our stakeholders and well-wishers.

I thank you all for the continued support and faith in this journey.

Warm regards,

S.N. Goel

CMD, Indian Energy Exchange

REGULATORY NEWS

Ministry of Power Issues National Repowering and Life Extension Policy for Wind Power Projects

On 7th December 2023, the Ministry of Power issued a National Repowering and Life Extension Policy for Wind Power Projects. The policy enables:

Repowering/replacement of older generation turbines with newer generation more efficient turbines even before the design life is over, if the developers/owners choose to do so.

Estimated repowering potential as per NIWE~ 25.40 GW

Arrangement for Power Purchase:

- o Power generated corresponding to avg. of last 3 years generation prior to repowering would continue to be procured as per the terms of PPA in-force till the tenure of the PPA.
- o Existing PPA tenure shall be extended by a period equal to the repowering or max. 2 years.
- o Incumbent DISCOM shall neither have any right nor shall have any obligation to purchase the additional power generated after repowering.
- o The additional power generated can be sold- in the power exchange, or through bilateral agreement or through short/medium/ long term PPA.
- o A Wind turbine undergoing repowering would be exempted from supplying power to the purchasing DISCOM during repowering, subject to that the repowering period shall not exceed 2 years.
- o The old PPA can be terminated with mutual consent.

Ministry of Power Issues Draft Electricity (Late Payment Surcharge and Related Matters) Amendment Rules, 2023

On 13th December 2023, the Ministry of Power (MERC) issued the draft Electricity (Late Payment Surcharge and Related Matters) Amendment Rules. According to the draft:

In addition to short-term, medium-term and long-term access proposes to include Temporary GNA (T-GNA) or General Network Access (GNA) in clause 7 of the Rules for regulating access to beneficiaries / buyers in case of non-payment of dues, by the distribution licensee or other user of transmission system, even after two and half months from presentation of bill by the generating company or transmission licensee or trading licensee.

The draft in clause 9.1 included that a generating station shall offer the un-requisitioned surplus power and power available against the declared capacity of the unit under shut down and not requisitioned by a distribution licensee in the power exchanges.

Proposed inclusion of following provisos in clause 9.1

- o that if the power so offered by the generating company is not cleared in Day- Ahead Market (DAM), then it

shall be offered in other market segments including the Real Time Market (RTM), in the power exchange (s).

- o that such offer of power in the market shall be at a price not exceeding 120% of its energy charge, as determined or adopted by the Appropriate Commission.
- o that if the generating company fails to offer such un-requisitioned surplus power in the power exchange(s), the un-requisitioned surplus power to the extent not offered in the power exchange(s) up to the declared capacity shall not be considered as available for computing the payment of fixed charges .

In case of gain from sale of surplus power the generator shall be paid up to six paise per unit, fixed charges, liquidation of overdue amount and balance shall be shared in the ratio of 50:50 between the distribution licensee and the generating company.

CEA Finalises Phasing Out Plan for Flexible Operations of Coal based Thermal Generating Units Regulations, 2023

On 15th December 2023, the Central Electricity Authority (CEA) finalised the phasing out plan for the Flexible Operation of Coal based Thermal Generating Units Regulations 2023 after incorporating stakeholder comments. The regulations had been notified on 30th January 2023. According to the phasing out plan:

The utilities shall modify the units strictly within the duration stipulated under various phases in the Phasing Plan mentioned herein under.

The utilities shall avail the maximum shutdown period of 1 month as mentioned against each unit in the Phasing Plan.

As far as possible, the utilities shall match the shutdown period of upgradation/retrofits works for flexible operation with Annual Over Haul (AOH) period.

The following five phases have been identified under the Phasing Plan including a Pilot Phase:

- o PHASE- PILOT; To be completed by March 2024 - 10 nos. of units of 5850 MW in aggregate have been planned and identified for which the study, field tests, retrofits etc. have already been initiated for flexible operation. The upgradation/retrofitting for flexible operation to be completed before 31.3.2024.
- o PHASE-I; July 2024 to Jun. 2026- 91 units of 51,080 MW in aggregate of various thermal power plants have been planned and identified for the upgradation/retrofitting for flexible operation including the study and field tests.
- o PHASE-II; July. 2026 to Jun. 2028- 100 units of capacity 46825 MW in aggregate
- o PHASE-III: July. 2028 to Dec. 2029- 101 units of capacity 37215 MW in aggregate
- o PHASE-IV: Jan. 2030 to Dec. 2030- 191 units of capacity 55767 MW in aggregate of various thermal power plants have been planned and identified for the upgradation/retrofitting for flexible operation including the study and field tests. In case the utilities comprehend that 40% operation of units having age more than 40 years under this phase is not viable/possible, the utilities may opt for 2-shift operation by suitable retrofits/study/tests. However, the duration for the retrofits including the study/test of this phase shall be the same.

CERC issues an order for Removal of Difficulties (Second Order) under CERC IEGC Regulations, 2023

On 18th December 2023, the Central Electricity Regulatory Commission (CERC) Issued an order for Removal of Difficulties (Second Order) under CERC IEGC Regulations, 2023. According to the order :

Issue No. 1: Issue of minimum turndown schedule : CERC has held that-

- o Beneficiaries/buyers have full flexibility to decide on their requisition from a generating station up to 1430 hrs on 'D-1' day, right to revision in the said generating station for 'D' Day shall be subject to the condition that such revision of schedule for 'D' Day shall not be below their respective share of minimum turndown level.

Issue No. 2: Revision of Declared Capacity for partial loading : CERC has held that-

- o Generating stations or ESS covered under Regulation 49(7) of the Grid Code, except lignite, gas-based thermal generating stations and hydro generating stations, shall be allowed maximum 4 revisions of DC and schedule per day subject to maximum 60 revisions during a month, due to reasons such as a partial outage of the unit or variation of fuel quality or any other technical reason to be recorded in writing.
- o Lignite based, gas-based thermal generating stations and hydro generating stations shall be allowed 6 revisions of DC and schedule in a day subject to maximum 120 revisions during a month, due to reasons such as partial outage of the unit or water availability for hydro stations, fuel quality or variations in supply of gas for gas stations or any other technical reason.

Issue No. 3: Scheduling of free power share in the Central Generating Stations: CERC has held that-

- o The Government of Himachal Pradesh (GoHP) is not a drawee entity. It is entitled to the free power which it can sell as per the Electricity (Removal of Difficulty) Third order 2005 dated 08.06.2005. GoHP is a unique case of an entity which is neither a generator nor a trader buying electricity for sale.
- o As GoHP cannot directly consume the power, CERC is of the view that GoHP or similar such Govts. of hydro-rich states may sell their entitled share of free power directly from the bus bar of generating station.

Fungibility and Optimized Price Discovery - Transforming India's REC Market

By Rohit Bajaj,

Executive Director, Business Development, Strategy and Regulatory Affairs, IEX.

(This article appeared in the Financial Express 18th December, 2023)

India, on the path to becoming a \$5 trillion economy, is facing a soaring demand for electricity fueled by robust domestic demand, industrialisation, and urbanisation. To meet this surging demand and align with its commitment to achieve net-zero carbon emissions by 2070 and source 50% of its annual power from non-fossil fuels, significant decarbonisation efforts are underway. Presently, about 180 GW, constituting 42% of the country's total installed power capacity, is derived from renewable energy sources. Further, to promote Renewable Energy Sources, the Central and State Electricity Regulators have mandated the Obligated Consumers (Distribution Companies, Open Access Consumers, and Captive Consumers) to fulfill a fixed percentage of their overall procurement through green energy sources, in the form of Renewable Purchase Obligations (RPOs). However, regional disparities in renewable energy potential exist, with states like Rajasthan and Tamil Nadu having vast potential while others like Delhi are limited. These disparities result in a lack of ability to fulfil such mandated compliances. Addressing this disparity is crucial to ensuring equal contributions from all stakeholders towards India's renewable energy goals.



To address these challenges, the Central Electricity Regulatory Commission (CERC) introduced Renewable Energy Certificates (RECs) in 2010 which is a robust and transparent ecosystem for trading green energy certificates. These market-based instruments facilitate trading between obligated entities and renewable energy generators through power exchanges. The REC market is aiming to bolster renewable capacity by creating a nationwide marketplace that supports producers in realizing their green energy investments and obligated entities in fulfilling their obligations.

Transformation of REC Market

Initially, RECs were divided into two categories: solar and non-solar, based on the renewable source used for electricity generation. They were traded at the floor and forbearance prices on power exchanges wherein the prices were revised from time to time and most of the time the REC certificates were traded at the floor price due to surplus inventory.

New CERC regulations, effective from 5th December, 2022, have eliminated the concept of a floor price. Following these changes, REC prices experienced a 62% fall from Rs 1,000 per REC to Rs 380 per REC.

Also, with the CERC Order dated 08th October 2023, the categorisation of REC: solar and non-solar based on the renewable source has been done away with. Consequently, REC categorisation no longer exists, making it simpler for obligated entities to fulfil their obligations with RECs regardless of their respective SERCs' alignment.

Optimized Price Discovery and Transparency in trading of RECs through Power Exchanges

The REC market has transformed with floor and forbearance price removal. New regulations favor a market-driven approach with enhanced inventory and transparency. Despite trading also being allowed in Bilateral Mode, the market is witnessing major trades happening on power exchanges only. In July and August 2023, power exchanges saw 7.25 lac and 3.33 lac RECs trades respectively, while bilateral trades were in the range of 10- 15% of total REC trades.

Power exchanges have now initiated fortnightly trades, instead of monthly trades, thereby providing more sessions to obligated entities to fulfill their obligations. Further, exchanges provide closed auction as price discovery mechanism wherein uniform price is discovered and applied to all participants. With its efficient and competitive price discovery process and transparency, power exchanges maintain their status as the most preferred platform for REC trading.

Penal consequences for non-compliance

The Ministry of Power and Regulatory Authorities are enhancing efforts to ensure compliance with obligations by enforcing stricter penalties. In addition to the existing penalties outlined by Regulatory Authorities, the Ministry of Power, in accordance with Section 26(3) of the Energy Conservation Act, has introduced significant penalties, which may reach up to double the cost of each metric ton of oil equivalent as applicable.

Conclusion

With the introduction of these path-breaking reforms, there will be a substantial increase in liquidity which will boost price discovery, aligning with India's renewable energy and decarbonization goals. Uniformity of prices and transparency in price discovery presents an opportune moment for obligated consumers, including state distribution companies, open-access and captive buyers to actively participate in the trading platform and meet their RPOs at a much cheaper price. This proactive approach not only aids in environmental sustainability but also safeguards against potential penalties associated with non-compliance. Further, it is a great opportunity for voluntary consumers to procure green certificates at a lower price and achieve their decarbonisation and net-zero emissions targets.

MARKET NEWS

ELECTRICITY MARKET

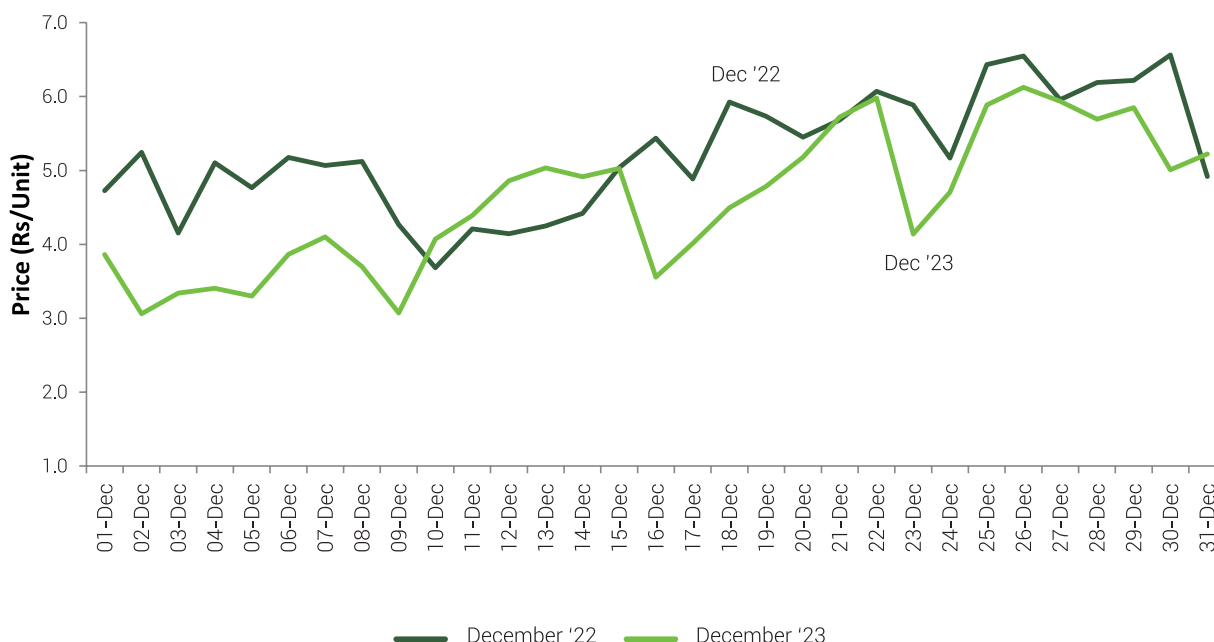
Indian Energy Exchange, India's premier energy exchange, achieved 9,707 MU overall volume in December'23, including 10.52 Lac Renewable Energy Certificates (RECs) (equivalent to 1052 MU), marking a 14.9% increase on YoY basis. IEX achieved 8,655 MU total electricity volume in December 2023, registering an increase of 8.7% on YoY basis.

For the third quarter of the fiscal year 2024, IEX achieved 28,326 MU overall volume, registering an increase of 16.9% YoY basis.

According to government data published in December '23, the country's energy consumption remained flattish at 119.07 BUs in December'23.

The Market Clearing Price in the Day Ahead Market for the month was Rs. 4.54/unit, marking a 13% YoY decrease. With favourable Policy and Regulatory interventions, the sell bids on the exchange (Day Ahead Market plus Real Time Market) during the month increased by 18% on YoY. Going forward, the sell liquidity is expected to further improve, leading to a decline in power prices on the Exchanges. This will present an opportunity for Discoms and Industrial consumers to optimize their power procurement costs.

MCP FOR DECEMBER '22 & DECEMBER '23



DAY- AHEAD, TERM- AHEAD & REAL- TIME ELECTRICITY MARKET

The Day-Ahead Market (DAM) volume was at 4,798 MU in December '23, as compared to 5,001 MU in December '22. The DAM segment registered total volumes of 14,684 MU during Q3 FY '24, a marginal increase of 1.5% over Q3 FY '23.

The Real-Time Electricity Market (RTM) volume increased to 2,405 MU in December '23, from 1,763 MU in December'22, registering an increase of 36.4 % YoY. The RTM segment registered volume of 7,166 MU during Q3 FY '24, increasing 31.9% over Q3 FY '23.

Day Ahead Contingency and Term-Ahead Market (TAM), comprising of contingency, daily & weekly and monthly contracts up to 3 months, traded 1,220 MU during December '23, higher by 48.4% on YoY basis. The total volume on the segment during the quarter was 3,810 MU, growth of 91.4% over Q3 FY'23.

GREEN MARKET: DAY-AHEAD & TERM-AHEAD

IEX Green Market, comprising the Green Day-Ahead and Green Term-Ahead Market segments, achieved 232 MU volume during December'23. During Q3FY24, the segment achieved volume of 609 MU.

The Green Day-Ahead Market (G-DAM) achieved 216.6 MU volume during the month, with a weighted average price of Rs 4.86 per unit. The segment saw participation from 187 market participants during the month. During Q3FY24, the segment achieved volume of 579.6 MU.

The Green Term-Ahead Market (G-TAM) achieved 15.4 MU volume in December '23, with average monthly price of Non-Solar- Rs 6.08/unit. During Q3FY24, the segment achieved volume of 29.9 MU.

RENEWABLE ENERGY CERTIFICATE MARKET

A total of 10.52 lac RECs (equivalent to 1052 MU) were traded in the trading sessions held on 13th December '23 and 27th December'23, at a clearing price of Rs. 370/REC and Rs. 360/REC respectively. REC traded volume in December'23 increased by 115.9% on YoY basis. A total of 20.24 lac RECs (equivalent to 2,024 MU) were traded during Q3 FY'24.

The next REC trading sessions at the Exchange are scheduled on 10th January '24 and 31st January '24.

TRADE INSIGHTS DECEMBER 2023

CONVENTIONAL POWER MARKET

DAY-AHEAD MARKET

Price Snapshot (₹/kWh)

| AREA PRICES | | | |
|-------------|---------|---------|---------|
| Area | Average | Minimum | Maximum |
| All India | 4.54 | 2.05 | 10.00 |

1 MU= 1 Million kWh= 1 GWh

| VOLUME | | | | |
|--------------------|-----------|----------|----------------------|----------------|
| Volume | Sell Bids | Buy Bids | Unconstrained Volume | Cleared Volume |
| Total Volume (MU) | 9,239.2 | 8,358.3 | 4,797.7 | 4,797.7 |
| Average Daily (MU) | 298.0 | 269.6 | 154.8 | 154.8 |

| PARTICIPATION | | |
|-------------------------------|-----------------------|--------------------|
| Total Registered Participants | Open Access Consumers | Private Generators |
| 7,500+ | 4,600+ | 600+ |

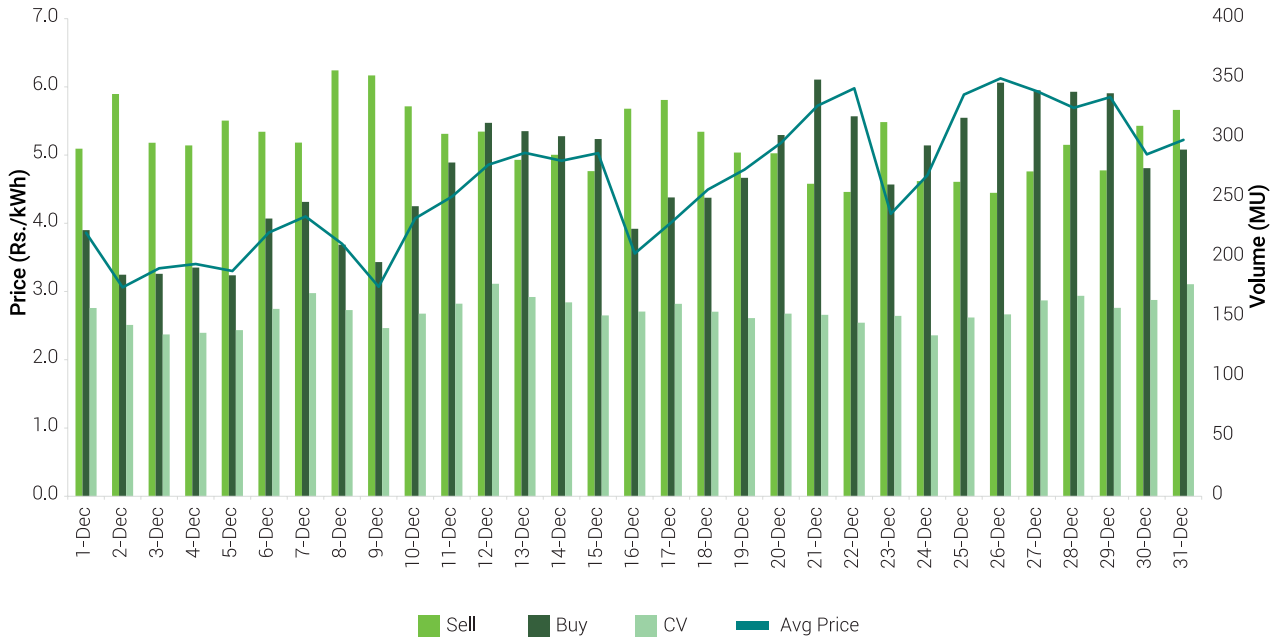
TERM-AHEAD MARKET

| Contracts | Total Volume (MU) | Max. Price (₹/kWh) | Min. Price (₹/kWh) |
|-------------------------|-------------------|--------------------|--------------------|
| Intraday | 0.9 | 10.00 | 7.80 |
| Day-Ahead Contingency | 147.4 | 10.00 | 2.11 |
| Daily | 501.6 | 10.00 | 4.95 |
| Weekly | 65.2 | 6.15 | 6.15 |
| Monthly | 505.1 | 9.00 | 5.17 |
| Total TAM Volume | | 1220.3 | |

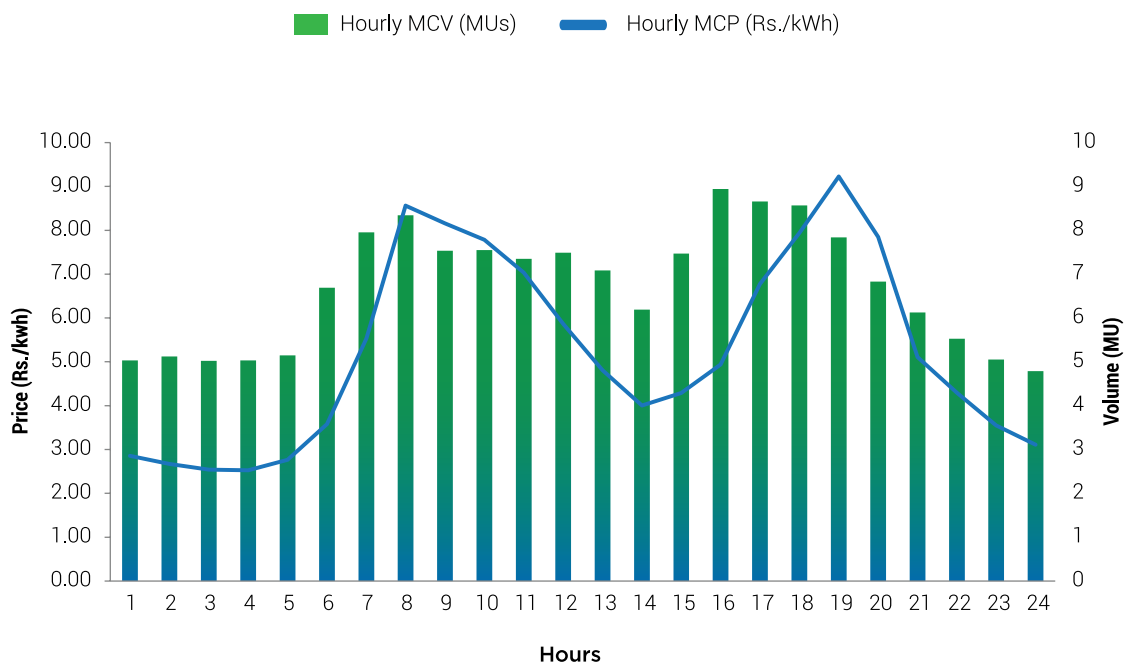
Scheduled Volume in the month based on Delivery Date

TERM-AHEAD MARKET

Daily Trade Details



Average Hourly Market Clearing Volume and Price



REAL-TIME MARKET



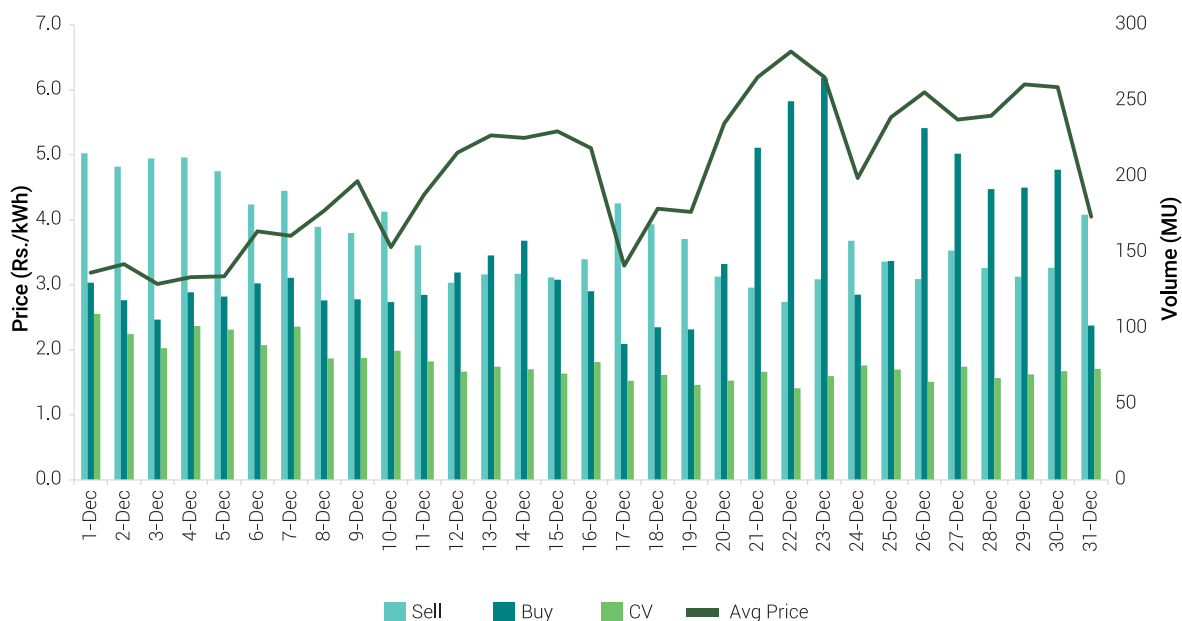
Price Snapshot (₹/kWh)

| AREA PRICES | | | |
|-------------|---------|---------|---------|
| Area | Average | Minimum | Maximum |
| All India | 4.70 | 0.99 | 10.00 |

1 MU= 1 Million kWh= 1 GWh

| VOLUME | | | |
|-------------------|-----------|----------|----------------------|
| Volume | Sell Bids | Buy Bids | Unconstrained Volume |
| Total Volume (MU) | 4,956.4 | 4,606.1 | 2,404.6 |

Daily Trade Details



GREEN DAY-AHEAD MARKET

Price Snapshot (₹/ kWh)

| AREA PRICES | | | |
|-------------|---------|---------|---------|
| Area | Average | Minimum | Maximum |
| All India | 5.36 | 2.85 | 10.00 |

1 MU= 1 Million kWh= 1 GWh

| VOLUME | | | | |
|--------------------|-----------|----------|----------------------|----------------|
| Volume | Sell Bids | Buy Bids | Unconstrained Volume | Cleared Volume |
| Total Volume (MU) | 336.6 | 1541.1 | 216.6 | 216.6 |
| Average Daily (MU) | 10.9 | 49.7 | 7.0 | 7.0 |

GREEN TERM-AHEAD MARKET

| | Intra-day (Solar) | Intra-day (Non Solar) | Intra-day (Hydro) | Day-Ahead Contingency (Solar) | Day-Ahead Contingency (Non-Solar) | Day-Ahead Contingency (Hydro) | Weekly (Solar) | Weekly (Non-Solar) | Daily (Solar) | Daily (Non-Solar) |
|--------------------|-------------------|-----------------------|-------------------|-------------------------------|-----------------------------------|-------------------------------|----------------|--------------------|---------------|-------------------|
| Volume (MU) | - | - | - | - | - | - | - | - | - | 15.1 |
| Price (Rs/kWh) | - | - | - | - | - | - | - | - | - | 6.08 |
| Total Volume (MU)* | 15.1 | | | | | | | | | |

* Does not include Green LDCs

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