



IEX BULLETIN

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REGULATORY NEWS

CERC Issues Order on Deviation Settlement Mechanism Regulations 2022 in the Interest of Grid Security

On 6th February 2023, the Central Electricity Regulatory Commission (CERC) issued a Deviation Settlement Mechanism Order in the interest of grid security. The order is as follows:

- DSM charges capped at Rs 12 per kWh, until further orders.
- Frequency band revised between 49.95 to 50.03 Hz
In case system frequency < 49.95 Hz in a time-block:
 - General seller other than an ROR generating station or a generating station based on MSW:
 - For Ol: Paid back (i) @ 120% of reference charge rate when [49.90 Hz < f < 49.95 Hz]; and (ii) @ 150% of reference charge rate when [f ≤ 49.90];
 - For Ul: Pay (i) higher of @ 150% of reference charge rate or @ 120% of normal rate, when [49.90 < f < 49.95]; and (ii) higher of @ 200% of reference charge rate or @ 150% of normal rate, when [f ≤ 49.90];
 - The Buyer:
 - For UD: Paid back (i) @120% of normal rate when [49.90<f<49.95]; & (ii) @150% of normal rate when [f ≤ 49.90];
 - For OD: Pay (i) @150% of normal rate when [49.90<f<49.95]; & (ii) @200% of normal rate when [f ≤ 49.90]

In case system frequency > 50.03 Hz in a time-block:

- General seller other than an ROR or MSW based generating station:
 - For Ol: Paid back (i) @ 50% of reference charge rate when [50.03 < f < 50.05]; and (ii) @ zero when [f ≥ 50.05];

- o For UI: Pay (i) @75% of reference charge rate, when $[50.03 < f < 50.05]$; & (ii) @50% of reference charge rate, when $[f \geq 50.05]$;

■ **The Buyer**

- o For UD: Paid back (i) @ 50% of normal rate when $[50.03 < f < 50.05]$; and (ii) @ zero when $[f \geq 50.05]$;
- o For OD: Pay (i) @ 75% of normal rate when $[50.03 < f < 50.05]$; and (ii) @ zero when $[f \geq 50.05]$

CERC Issues First Amendment to Sharing of Inter-State Transmission Charges and Losses Regulations, 2020

On 7th February 2023, the Central Electricity Regulatory Commission (CERC) issued the first amendment to Sharing of Inter-State Transmission Charges and Losses Regulations, 2020. The amendments are as follows:

- Transmission bills will be raised only to Drawee Designated ISTS Customers (DICs)
- Reference to General Network Access Renewable Energy (GNA-RE) included in the amendment
- The Yearly Transmission Charges (YTC) for the National Component shall be shared by all the drawee DICs in proportion to their quantum of General Network Access (GNA) and GNA-RE
- The YTC for the Regional Component shall be shared by all the drawee DICs of the region in proportion to their quantum of GNA and GNA-RE
- The YTC for Transformer Component shall be shared by all drawee DICs located in the State in proportion to their quantum of GNA and GNA-RE
- Transmission charges under AC-BC (Balance Component) shall be shared by all drawee DICs in proportion to their quantum of GNA and GNA-RE
- Transmission Deviation Rate in Rs/MW = $1.25 \times \text{Transmission Charges}$
- RE waiver to be provided as per formulae provided in Annexure-III of the amendment regulations distinctly for (i) Entities using their GNA for RE procurement (ii) Entities using GNA-RE for such RE procurement
- Late Payment Surcharge (LPS) shall be payable by DIC as per the LPS Rules
- Transmission charges for T-GNA (Temporary GNA) and T-GNARE (Temporary GNA Renewables Energy)
- T-GNA Rate (in Rs/MW/time-block) = $\frac{\text{Transmission charges for all drawee DICs located in the State} \times 1.10}{(\text{number of days in a month} \times 96 \times \text{GNA and GNARE quantum, in MW, for all drawee DICs located in the State considered for billing, for corresponding billing period})}$
- Transmission charges payable by entities granted T-GNA or T-GNARE, as per last published TGNA rate for State in which entity is located
- Transmission charges for T-GNA and T-GNARE collected in a billing month, shall be reimbursed to drawee DICs in proportion to their share in first bill in following billing month, after adjustment of such charges for RE waiver as per Annexure-III to these regulations
- Regulations will come into effect from date notified separately by CERC



Telangana State Electricity Regulatory Commission Releases Discussion Paper on Terms and Conditions of Open Access, Regulation, 2023 For Public Consultation

On 8th February 2023, the Telangana State Electricity Regulatory Commission released a discussion paper on Terms and Conditions of Open Access, Regulations, 2023 for public consultation. The following points have been outlined in the discussion paper:

- Open Access user having Contracted Capacity of above 1 MVA are eligible for Open Access
- Nodal Agency for long-term OA transactions shall be State Transmission Utility (STU). Nodal Agency for short-term OA transactions shall be State Load Dispatch Centre (SLDC)
- SLDC to allow short-term OA transactions only after consulting the concerned Transco and/or discom
- Short-term OA transactions with duration less than 1 week, the SLDC may not consult the concerned licensees
- Defined procedure for Green Energy Open Access
- Each OA Generator, Scheduled Consumer and OA Consumer shall provide Wheeling Schedule to SLDC/ DISCOM for each 15-minute time block for a day, on day-ahead basis by 10:00 a.m. on day preceding commencement of first-time block for which the wheeling of energy is scheduled
- Surplus energy of green energy OA consumer, from 'Green Energy' Generating Station, after own consumption, may be banked with Discom
- Banking permitted on monthly basis on collection of banking charges of 8% in kind

Banking settlement period will be a calendar month. No carry forward or deemed purchase of unutilised banked quantum of energy. Such unutilised banked energy shall be considered as lapsed at the end of each calendar month; Green Energy OA consumer entitled to REC to that extent

MoP Issues Draft Guidelines to Promote Development of Pump Storage Projects (PSP)

On 15th February 2023, the Ministry of Power (MoP) issued draft guidelines to promote development of Pump Storage Projects (PSPs). The guidelines are as follows:

- Potential- CEA estimates on-river PSP potential of 103 GW
- Currently, 8 projects (4.7 GW) are in operation, 4 projects (2.7 GW) under construction & 24 projects (26.6 GW) allotted by States for development

Barriers in development of PSPs-

- Environmental clearances
- Requirement of free power
- Cost of pumping power
- Adequate value of peak power
- Taxation- Concessions available to other RE sources, are yet to be extended to PSPs. PSP components are taxed at GST rate of 18%/28%, whereas the GST on other RE sources is kept as 12%



Allotment of project sites for PSPs

- State Governments may allot project sites to developers- (i) On nomination basis to CPSUs and State PSUs; (ii) through competitive bidding, (iii) Allotment through TBCB
- Requires market reforms: (i) Commission to ensure that grid support services are suitably monetised. (ii) Commission to notify Peak and Off-Peak tariffs. (iii) PSPs and other storage projects shall be allowed to participate in HP-DAM segment

Uttarakhand Electricity Regulatory Commission Issues Draft First Amendment to Tariff and Other Terms for Supply of Electricity from Renewable Energy Sources and Non-fossil fuel based Co-generating Stations Regulations, 2023

On 15th February 2023, the Uttarakhand Electricity Regulatory Commission issued the draft first amendment to Tariff and Other Terms for Supply of Electricity from Renewable Energy Sources and Non-fossil fuel based Co-generating Stations Regulations, 2023. The amendments are as follows:

RPO trajectory defined in line with MoP notification:

Year	Wind RPO	HPO	Other RPO	Total RPO	Storage RPO
2022-23	0.81%	0.35%	23.44%	24.61%	-
2023-24	1.60%	0.66%	24.81%	27.08%	1%
2024-25	2.46%	1.08%	26.37%	29.91%	1.50%
2025-26	3.36%	1.48%	28.17%	33.01%	2%
2026-27	4.29%	1.80%	29.86%	35.95%	2.50%
2027-28	5.23%	2.15%	31.43%	38.81%	3%
2028-29	6.16%	2.51%	32.69%	41.36%	3.50%
2029-30	6.94%	2.82%	33.57%	43.33%	4%

- Wind RPO- Met from WPPs commissioned after 31.3.2022. RPO met from wind energy consumed over & above 7% of total energy consumption, from WPPs commissioned till 31.03.2022
- HPO- Met from LHPs (including PSPs & SHPs), COD after 8.3.2019
- Other RPO met from any RE power project not mentioned above

- Storage RPO- Percentage of energy consumed from solar/wind with storage
- Percentage of RPO can be computed as a percentage of total energy purchased from all sources/generated by the Obligated Entity during the year for own consumption

Haryana Electricity Regulatory Commission Notifies Discom and Transco Tariff Order for FY 2023-24

On 15th February 2023, the Haryana Electricity Regulatory Commission (HERC) notified a Discom and Transco tariff order for Financial Year 2023-24. The key features of the order are as follows:

- HERC approved “Green Energy Premium” as the charge which such consumers opting for green energy will have to pay to the Discoms @ Rs 2.3/unit for Solar and Rs 1/unit for Non-Solar, over and above normal tariff
- HERC has approved 5.905 BU of power procurement from short term market at a rate of Rs 6.27/ unit
- No change in Tariff

HERC has discontinued levy of wheeling charges on STU connected consumers.

	Units	Voltage	FY 2022-23	FY 2023-24	Change in Charge
Wheeling Charge	Rs/kWh	HT	0.84	0.86	+0.02
	Rs/kWh	EHT	0.54	0.00	-0.54
CSS	Rs/kWh	HT Industry	1.21	1.24	+0.03
	Rs/kWh	HT NDS	1.33	1.24	-0.09
Transmission Charge	Rs/kWh	-	0.42	0.41	-0.01

CERC Notifies Date of Implementation of Ancillary Service Regulations, 2022

On 15th February 2023, the Central Electricity Regulatory Commission (CERC) notified the data of implementation of the Ancillary Service Regulations, 2022. Accordingly, the CERC Ancillary Services Regulations 2022 issued on 31.01.2022, shall be implemented from 01.04.2023.

CERC Approves Introduction of High-Price Day Ahead Market (HP-DAM) Order at IEX

On 16th February 2023, the Central Electricity Regulatory Commission (CERC) approved the introduction of the High-Price Day-Ahead Market (HP-DAM) at the Indian Energy Exchange. The eligibility criteria are as follows:

Eligible Sellers for HP-DAM-

- Gas based generating stations using imported RLNG (Re-gasified Liquefied Natural Gas) and Naphtha;
- Imported coal based generating stations using only imported coal;



- Battery Energy Storage Systems (BESS)
- Category of Gencos eligible to participate in HP-DAM to be reviewed periodically by the Commission

Buyers:

- Buyers will have option to auto-carry uncleared bids from DAM to HP-DAM
- Buyers can also separately place bids in HP-DAM
- During auto-carry option, buyers have flexibility to specify different prices for the un-cleared quantity in DAM
- IEX to provide an option to buyers to quote max quantum of unselected bids from DAM that they would like to carry to HP-DAM
- Market Clearing shall take place in a sequential manner i.e., first DAM will be cleared followed by HP-DAM
- Price discovery for HP-DAM will be Double-Sided Closed Auction
- Market Timelines will be same as Integrated-DAM
- Till the IEGC is amended, as an interim arrangement in the event of congestion, curtailment shall follow the sequence of curtailment of HP-DAM transactions first, followed by DAM, GDAM & RTM
- NLDC to compile a list of all eligible sellers and publish on its website
- Floor price – Zero, Upper price limit -Rs 50/kWh for HP-DAM

POSOCO Issues Detailed Draft Procedure for Tertiary Reserve Ancillary Service (TRAS)

On 20th February 2023, Power System Operation Corporation Limited (POSOCO) issued a detailed draft procedure for Tertiary Reserve Ancillary Service (TRAS). The following procedures have been made:

Nodal Agency (NLDC)

- NLDC shall communicate to PX(s), quantum of requirement of TRAS-Up and TRAS-Down on Day-Ahead and Real-Time basis
- NLDC to perform price discovery based on sell bids & TRAS requirement
- NLDC would activate & give TRAS dispatch instructions to TRAS

RLDCs/SLDCs

- RLDCs/SLDCs will issue standing clearance to eligible entities
- Standing clearance issued for short term market valid for TRAS market

TRAS Providers

- TRAS Providers to submit “Energy-Up” and “Energy-Down” bids in PX(s) DAM AS & RTM AS Market
- TRAS Providers to interact with PX(s) for TRAS-Up & TRAS-Down cleared

Power Exchange(s)

- PXs will design separate market for Ancillary Services contracts for TRAS
- PX(s) will collect & provide bids by TRAS Providers to NLDC

Eligibility of TRAS Provider

Genco or entity having energy storage or entity capable of providing demand response connected to ISTS or InSTS. TRAS provider should be capable of providing TRAS within 15 minutes & sustaining the service for at least next 60 minutes;

- TRAS quantum to be procured by NLDC shall be communicated to Power Exchange(s) before the start of bidding session
- Minimum quotation step/price tick- Rs 100 per MWh subject to maximum ceiling of Rs 50,000 per MWh
- TRAS Providers to submit bids for each time block in DAM AS & RTM AS

After clearing of DAM Market, residual uncleared bids of eligible DAM participants who have opted to carry over, would be transferred to DAM AS bid stack. Such transfer of uncleared bids shall not be done in RTM AS

- Price Discovery for TRAS-Up- Uniform Market Clearing Price-Highest Energy-Up bid corresponding to requirement for TRAS- Up
- Price Discovery for TRAS-Down- Pay as-bid- Energy-Down bids shall be stacked in a descending order from highest to lowest Energy-Down bid and Nodal Agency shall select TRAS-Down Providers to meet the estimated requirement in that order

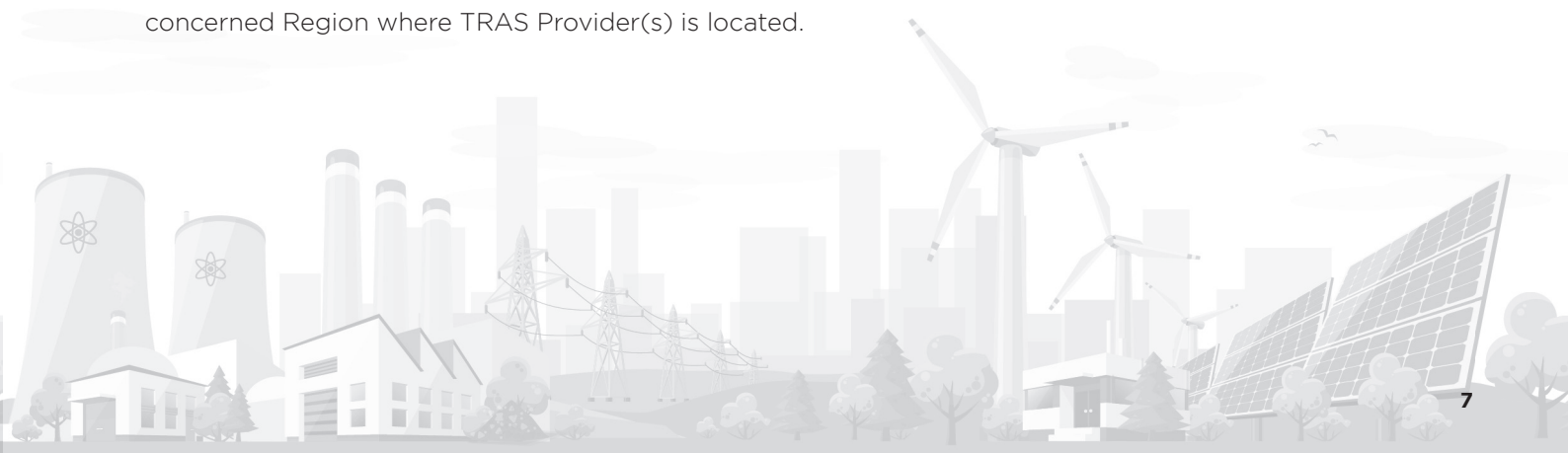
Procurement of TRAS

- Till notification of revised Grid Code, bidding timelines shall be same as those prevailing for the DAM/RTM Energy Market
- Nodal agency shall conduct price discovery by 1530 hrs
- Nodal Agency would run separate solution for clearing TRAS Up & Down. Nodal Agency will calculate MCP/ MCV for TRAS-up by 1600 hrs
- Nodal Agency would send cleared TRAS Up & Down details by 1630 hrs
- No ISTS charges and losses applicable for the TRAS Up and Down delivery

Shortfall in Procurement of TRAS

- All ISGS genco u/s 62, including those having URS power after declaration of the RTM results, shall be deemed to be available for TRAS
- Above gencos would declare energy charges upfront on monthly basis
- Above gencos whose URS is dispatched for TRAS-Up, shall be paid @110% of their energy charges for the quantum of TRAS-Up dispatched
- Above gencos if dispatched for TRAS-Down, they shall pay back @90% of their energy charges, corresponding to TRAS-Down quantum dispatched
- Any shortage or excess delivery of electricity from total schedule, including TRAS Contracts traded on PX will be settled under DSM

Payment to TRAS Provider(s) to be from surplus available in DSM and Ancillary Service Pool Account of concerned Region where TRAS Provider(s) is located.



Himachal Pradesh Electricity Regulatory Commission Notifies Renewable Power Purchase Obligation and its Compliance Regulations, 2023

On 24th February 2023, the Himachal Pradesh Electricity Regulatory Commission notified an order with regards Renewable Power Purchase Obligation and its Compliance Regulations, 2023. The order is as follows:

RPO trajectory defined in line with MoP notification:

Year	Wind RPO	HPO	Other RPO	Total RPO	Storage RPO
2022-23	0.81%	0.35%	23.44%	24.61%	
2023-24	1.60%	0.66%	24.81%	27.08%	1%
2024-25	2.46%	1.08%	26.37%	29.91%	1.50%
2025-26	3.36%	1.48%	28.17%	33.01%	2%
2026-27	4.29%	1.80%	29.86%	35.95%	2.50%
2027-28	5.23%	2.15%	31.43%	38.81%	3%
2028-29	6.16%	2.51%	32.69%	41.36%	3.50%
2029-30	6.94%	2.82%	33.57%	43.33%	4%

Wind RPO- Met from WPPs commissioned after 31.3.2022 & RPO met from wind energy consumed over & above 7% of total energy consumption, from WPPs commissioned till 31.03.2022.

- HPO- Met from LHPs (including PSPs & SHPs), COD after 8.3.2019
- Other RPO met from any RE power project not mentioned above
- Storage RPO- %age of energy consumed from solar/wind with storage
- Shortfall in any category of RPPOs may be met by purchasing certificates related to other categories of RPPOs by suitably applying such Certificate multiplier fixed by the Central Commission
- RE Generator to provide a Certificate from concerned entity, to whom such generator is selling power from his RE project, to the effect that such energy has not been adjusted for offsetting RPPOs, before the State Agency & other concerned agency(ies) accord permission, to RE Generator, for accreditation & issuance of RECs

MoP Issues Order on Renewable Generation Obligation as per Revised Tariff Policy, 2016

On 27th February 2023, the Ministry of Power (MoP) issued an order with regards Renewable Generation Obligation (RGO) as per the revised tariff policy 2016. The order is as follows:

- Coal/lignite-based generating stations required to establish RE capacity (in MW)/RGO of minimum 40% of thermal capacity (in MW) or procure & supply RE equivalent to such capacity
- Stations with COD between 01.04.2023 to 31.03.2024 to comply with RGO by 01.04.2025. Stations with COD after 01.04.2025 required to comply with by COD
- Coal/lignite based CPP exempted from RGO if RPO complied

POWER MARKET TRENDS: INDIA'S TRANSITION TO CLEAN ENERGY

By Rohit Bajaj, Head, Business Development, Regulatory Affairs & Strategy, IEX, appeared in Powerline on February 13th 2023

India is in the midst of an energy transition, driven by a massive thrust on electrification as well as renewables integration. This presents unique opportunities to all the stakeholders of the country's power sector, to innovate and contribute to this momentous journey. India is the third largest producer and consumer of electricity in the world, consuming about 1,400 billion units of electricity on an annual basis. The short-term power market covers about 13-14 per cent of India's power sector, accounting for over 180 BUs.

The Government of India has identified power as a key sector to promote sustained industrial growth. With the Purchasing Manager's Index rebounding to pre-pandemic levels, power demand growth is expected to remain strong at about 7-8 per cent. Further, the target of becoming net zero by the year 2070 has fast-tracked the pursuit of sustainability and renewable-led energy transition in the long term. India has emerged as the front runner on the road to carbon-neutrality, having achieved the fastest rate of growth of renewable energy capacities in the world. India currently has the fourth-highest installed base for green power worldwide, with almost 168 GW of renewable energy capacity as of December 2022, accounting for about 41 per cent of the total installed power capacity.



Energy security as a key enabler of sustained growth

The geopolitical crises last year caused severe supply-side disruptions, resulting in a spike in coal prices and, in turn, higher electricity prices. Although the Indian government's timely intervention kept the situation under control, the need to attain energy self-sufficiency regained focus. Recently, India divulged its four-plank energy security strategy, which is based on diversifying supplies, increasing exploration and production, exploring alternative energy sources, and achieving transition towards cleaner sources of energy. Going forth, the government's actions will be aligned with the goal of helping the country meet its energy security needs, primarily by achieving self-sufficiency throughout the entire renewable energy value chain.

Decarbonising India's power sector

India's G20 presidency will complement its strides towards its clean energy targets of reducing the emissions intensity of the GDP by 45 per cent from 2005 levels by 2030, and achieving 50 per cent cumulative installed capacity from cleaner energy resources by 2030. Several policy and regulatory interventions have been put in place to accelerate the decarbonisation of the power sector. The renewable purchase obligation (RPO) has been doubled from 22 per cent in 2022 to 44 per cent for 2030. Green energy open access now allows smaller prosumers with even 100 kW of connected loads to buy or sell renewable energy. Various measures will continue to be taken to minimise the integration cost of renewables – such as auctioning hybrid renewable energy projects, increasing battery storage, shifting the agricultural load from night-time to day-time, solarising the agricultural load and tightening deviation bands.



Realising the crucial role of power markets in achieving the energy transition, the government aims to increase the share of power exchanges from the current 7.5 per cent to 25 per cent by financial year 2024. Spot markets, including the day-ahead market (DAM), the green market, the real-time market (RTM) and market-based ancillary services, will serve as enablers of the large-scale renewable energy capacity addition, while reducing the cost of integration. Globally, power exchanges have helped reduce the cost of renewable integration and provide efficient price signals for newer capacity addition. Further, power markets are key in managing the intermittencies of renewables, as they enable efficient integration with conventional power as well as the most efficient matching of demand and supply.

Rise of green markets in India

The exchange-led electricity and renewable energy market provides a diverse spectrum of market-based products and contracts, including the RTM, the green term-ahead market, and the green DAM. A pan-Indian exchange-based green market is facilitating obligated entities such as discoms, open access consumers and captive power plants in fulfilling their RPOs at competitive prices.

Last month, the Ministry of Power issued an order for the waiver of interstate transmission system (ISTS) charges on the transmission of electricity generated from new hydropower projects. With this waiver already being available to solar and wind power projects, the implementation of these regulations will provide a boost for renewable energy.

To increase market liquidity in the segment, the government may look at providing dynamic interchangeability between renewable energy certificates and green power.

A vibrant green market will encourage renewable-rich states to increase their capacities beyond RPOs, and sell the surplus power in the market. Further, renewable energy generators may be permitted to buy from the RTM segment to manage the variations in green energy production.

Implementation of general network access

As part of its continued efforts to improve energy access, GNA is being implemented, which allows eligible discoms and gencos to draw or inject power from specific points along the ISTS. This can enrich collective markets, alongside removing arbitrage and providing a foundation for merchant plants. The GNA Regulations will go a long way in streamlining network access and network usage charges.

Introduction of ancillary markets

The introduction of ancillary markets is much anticipated by the energy sector. The operation of these markets will go a long way in helping system operators maintain grid stability and will inculcate discipline across the value chain. India's national grid operator, the NLDC, is expected to introduce the guidelines for participation, thus initiating trading in the ancillary markets.

Proliferation of carbon markets

Carbon markets have a crucial role to play in efficiently channelising climate finance towards sustainable projects by sending market signals to investors and corporates. The International Emission Trading Association estimates that the potential cost reductions through market mechanisms will exceed \$300 billion per year vis-à-vis the independent implementation of NDCs by countries.

A national carbon market in India will be hugely beneficial in providing a transparent price signal to the industries. Market-based carbon pricing instruments can enable industries to proactively plan their future capex and factor



in the cost of carbon emissions in their business decisions. Thus, global carbon markets, both mandatory and voluntary, will see increased traction this year towards the 1.5 degree pathway.

Increasing demand for battery storage

A NITI Aayog report predicts that India's battery storage potential will reach 600 GWh by 2030. The growing focus on electric vehicles, stationary storage and consumer electronics will be the key drivers of demand for battery storage. The Union Budget 2022-23 conferred infrastructure status to energy storage systems, including grid-scale battery systems. New measures that will encourage the setting up of grid-scale battery energy storage systems in the country are likely to continue.

Innovative market models

With the growing thrust on renewable energy, new market models are emerging to facilitate smooth integration of renewables. Contract for difference (CfD) is one such innovative mechanism, which alleviates the issues of forced restriction of renewable energy generation and payment delays, and avoids the issues associated with rigid long-term power purchase agreements (PPAs). CfDs introduce greater flexibility in PPAs and facilitate payment security for generators and discoms alike. Additionally, CfDs create a market for the trade of surplus renewable energy generation to areas that are deficit in green power.

Similarly, a virtual power purchase agreement (VPPA) allows financial transactions between renewable power generators and consumers, while the physical transaction is handled by discoms. VPPAs ensure certainty of cash flow for the renewable energy generator as per the PPA, thereby helping deepen the market and encouraging renewable capacity addition in India.

Power markets will serve as a stepping stone for these new models, which have the potential to advance the development of renewable forecasting algorithms. This will help address the main concerns of buyers and grid operators regarding the integration and assimilation of green generation in the grid.

Introduction of capacity markets

Stringent targets for renewable penetration necessitate having a certain capacity in place to ensure grid security and provide round-the-clock power to all. As greater capacities of intermittent renewable generation are added to the grid, the capacity market will act as a backup for generators and demand-side responders to balance the network during times of stress. Capacity markets are predicated on the generation resource adequacy requirement, which is the ability of the system to meet any level of power demand, including peak demand, at all times.

Capacity markets will help ensure capacity creation by maintaining the long-term demand profile at the country level. Going ahead, green markets can be expeditiously boosted for larger capacity additions and transactions through market-based models, thus creating a sustainable model for renewable energy, similar to what is seen in other developed countries. New generation capacity addition through capacity market auctions will improve liquidity in the market and encourage the integration of new technology into the grid.

Looking ahead

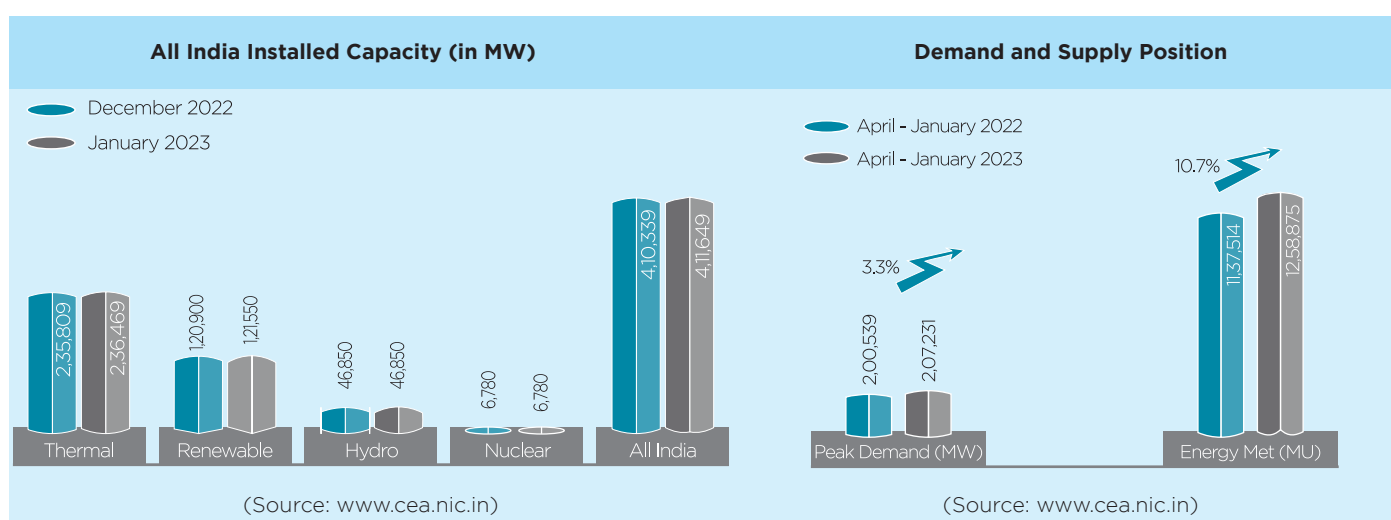
A resilient and sustainable power sector will be key to achieving India's vision of becoming a \$10 trillion economy by 2030. Continued support by the government and a conducive policy ecosystem will accelerate India's energy transition towards a green and inclusive economy. Power markets will soon have a much larger role to play in catalysing this transition through efficient and competitive mechanisms.



POWER INSIGHTS: FEBRUARY 2023

CAPACITY

- In January 2023, all India installed capacity stood at 4,11,649 MW with capacity addition of 1,309 MW during the month with break-up as below:
 - Thermal: 660 MW (Increase) • Renewable: 649 MW (Increase) • Hydro: No change • Nuclear: No change
- All India peak demand met reached 2,07,231 MW during April '22-January '23 registering 3.3% YoY increase from 2,00,539 MW during April '21-January '22.
- All India energy met reached 1,259 BU during April '22-January '23 registering 10.7% YoY increase from 1,137.5 BU during April '21-January '22.



Peak Demand Met Comparison of Key States (MW)

(Source: www.cea.nic.in)

The comparison of the peak demand met in the key states during April - January 2022 and April - January 2023 is as here under:

State	Apr-Jan '22	Apr-Jan '23	YoY change (%)
Maharashtra	25,644	28,846	12.5%
Gujarat	19,431	21,382	10.0%
Madhya Pradesh	15,917	17,238	8.3%
Uttar Pradesh	24,795	26,589	7.2%
Punjab	13,431	14,311	6.6%
Andhra Pradesh	11,570	12,293	6.2%
Haryana	12,120	12,768	5.3%
Tamil Nadu	16,519	17,248	4.4%
Karnataka	14,158	14,972	5.7%
Telangana	13,595	14,017	3.1%

Energy Met Comparison of Key States (MU)

(Source: www.cea.nic.in)

The comparison of the energy met in the key states April - January 2022 and April - January 2023 is as here under:

State	Apr-Jan '22	Apr-Jan '23	YoY (%)
Rajasthan	73,452	84,234	14.7%
Uttar Pradesh	1,08,839	1,24,426	14.3%
Gujarat	1,02,064	1,15,622	13.3%
Haryana	47,426	53,167	12.1%
Punjab	54,391	60,815	11.8%
Maharashtra	1,40,978	1,53,620	9.0%
Telangana	56,194	61,083	8.7%
Madhya Pradesh	70,039	75,707	8.1%
Andhra Pradesh	55,833	59,009	5.7%
Tamil Nadu	90,409	94,977	5.1%
Karnataka	57,325	59,617	4.0%

MARKET NEWS

ELECTRICITY MARKET

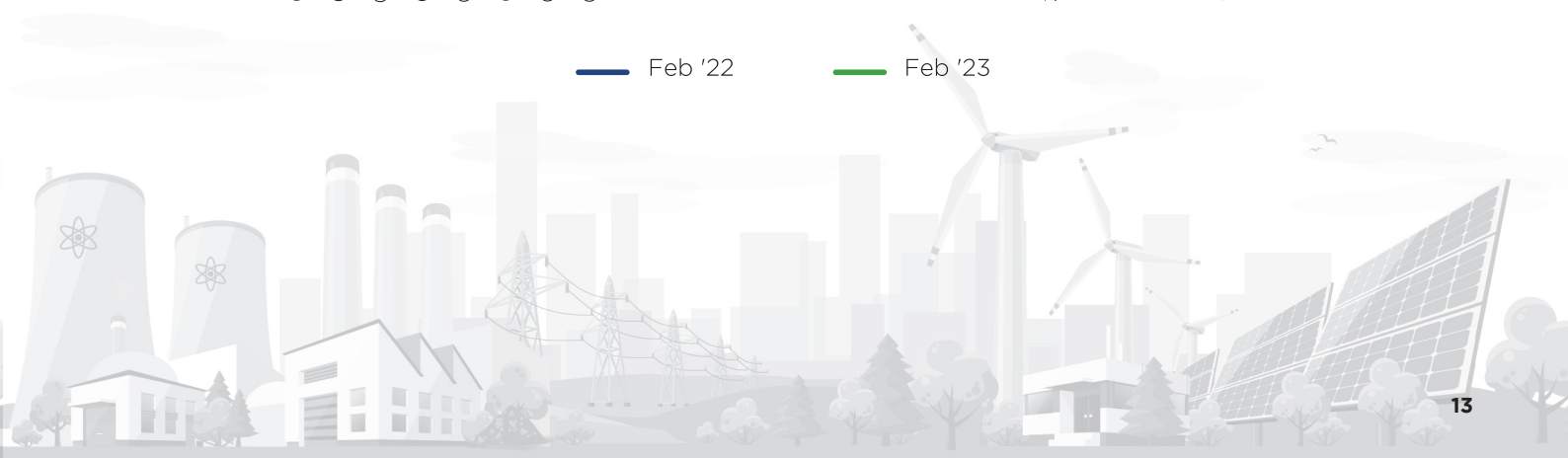
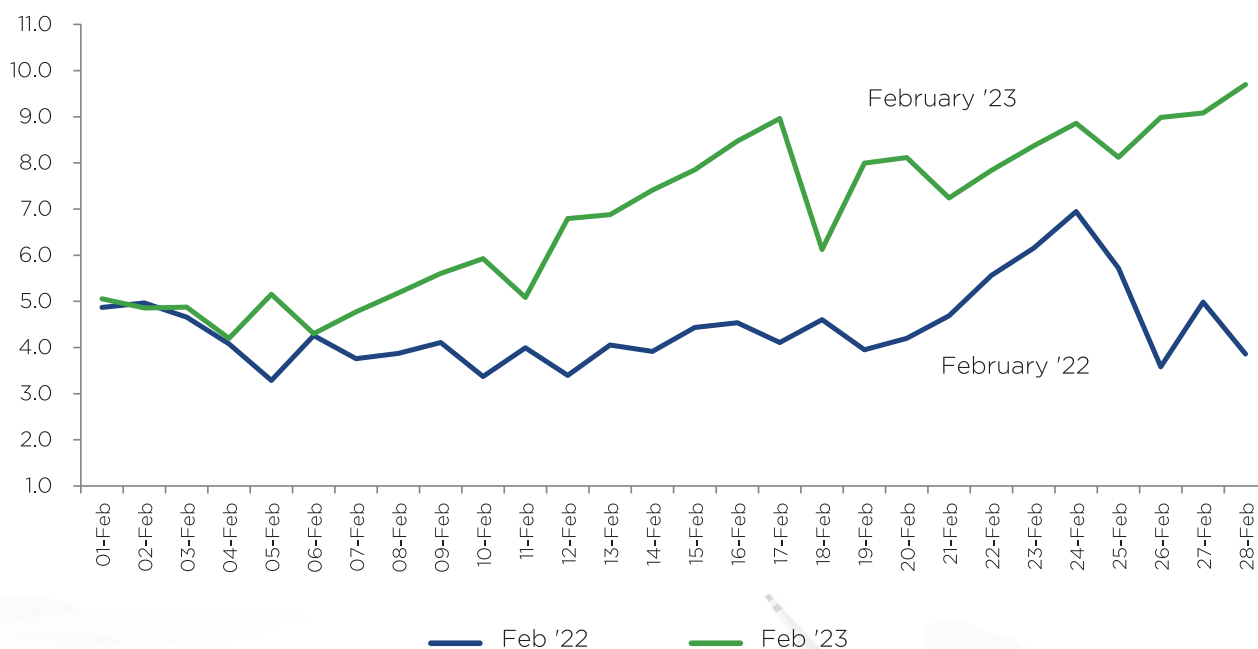
The Indian Energy Exchange, India's premier energy exchange, achieved 8200 MU total volume in February 2023, including Green Power trade of 341 MU, 3.74 lac RECs (equivalent to 374 MU) and 1.54 ESCerts (equivalent to 154 MU).

While the average daily volume traded on the Exchange increased in February '23 by 5% MoM, the overall volume declined 5% MoM due to lesser trading days vis-à-vis the previous month. The electricity volume on the Exchange in February '23 at 7673 MU, registered 6% decline on YoY basis and 7% MoM basis. The overall volume on the Exchange during the month was 8200 MU, degrowth of 7% on YoY basis.

Sell side liquidity continued to be affected due to high input costs. Demand for power increased due to unusually warm temperature witnessed in February across several parts of the country, and sustained momentum in economic activities. The energy met in the country during February '23 stood at 118 BU, 9% higher on YoY basis, as per data published by the National Load Dispatch Center.

Supply constraints are expected to ease in the coming months due to the conducive policy and regulatory initiatives. These initiatives will lead to increase in coal and gas-based generation, resulting in higher liquidity

MCP FOR FEBRUARY '22 & FEBRUARY '23



on the Exchange in the coming months. This will provide cost optimisation opportunities to Discoms and Open Access consumers.

IEX resumed trading of Energy Saving Certificates (ESCerts) on 14th February 2023, after a gap of 14 months. During the month, nearly 1.54 Lac ESCerts (equivalent to 154 MU) were traded on IEX, with 97% market share.

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

The **Day-Ahead Market (DAM)** volume decreased from 4893 MU in January '23 to 4664 MU In February '23, i.e 5% degrowth on MoM basis. The Day-Ahead Market volume was lower by 17% on YoY basis due to high prices resulting from a constrained supply scenario, which led to continued high spot e-auction coal prices.

The **Real-Time Electricity Market (RTM)** achieved 1714 MU volume during the month, registering 10% YoY growth. There were 722 participants in this segment during the month. The consistent growth of RTM segment reflects its relevance to distribution utilities and industries for efficiently balancing their power demand-supply in real-time basis.

The **Term-Ahead Market (TAM)**, comprising intra-day, contingency, daily & weekly contracts, and contracts up to 3 months, traded 954 MU during the month, an impressive increase of 81%on YoY basis and 5% on MoM basis.

GREEN MARKET: DAY-AHEAD & TERM-AHEAD

IEX Green Market, comprising the Green Day-Ahead and Green Term-Ahead Market segments, achieved 341 MU volume during February '23, down 2% on MoM basis.

The Green Day-Ahead Market achieved 250 MU volume with a weighted average price of Rs 6.57 per unit. The market saw participation from 203 market participants during the month, with the highest number of participants in a single day at 159 on 22nd February.

The Green Term-Ahead Market achieved 91MU volume with an average monthly price of Rs 8.22/unit for Non-Solar and Rs 10.18/unit for Hydro.

RENEWABLE ENERGY CERTIFICATE MARKET

A total of 3.74 lac RECs were cleared in the trading session at IEX held on Wednesday, 22nd February, with cleared price of Rs 1,000/REC. In the corresponding month last year, 6.12 lac RECs were traded. The next REC trading session at the Exchange is scheduled on Wednesday, 29th March '23.

ENERGY SAVING CERTIFICATES (ESCerts)

Trading of ESCerts under PAT Cycle II resumed on IEX platform from 14th February 2023. Trading takes place every Tuesday from 13:00 hrs. to 15:00 hrs. Floor price for trading is fixed at 10% of the price of one Mtoe of energy consumed, as notified by the Central Government, which translates to Rs 1840. In February '23, 1.54 Lac ESCerts (equivalent to 154 MU) were traded on IEX, with 97% market share. IEX pioneered trade in ESCerts under PAT Cycle I in 2017 with 100% trade on its platform.

TRADE INSIGHTS: FEBRUARY 2023

CONVENTIONAL POWER MARKET

DAY-AHEAD POWER MARKET

Area Prices

Price Snapshot (₹/kWh)

Area	Average	Minimum	Maximum
All India	6.85	2.87	12.00

VOLUME

1 MU = 1 Million kWh = 1 GWh

Volume	Sell Bids	Buy Bids	Unconstrained Volume	Cleared Volume
Total Volume (MU)	6,556.19	8,734.23	4,663.57	4,663.57
Average Daily (MU)	234.15	311.94	166.56	166.56

PARTICIPATION

Total Registered Participants	Open Access Consumers	Private Generators
7,300+	4,600+	600+

TERM-AHEAD POWER MARKET

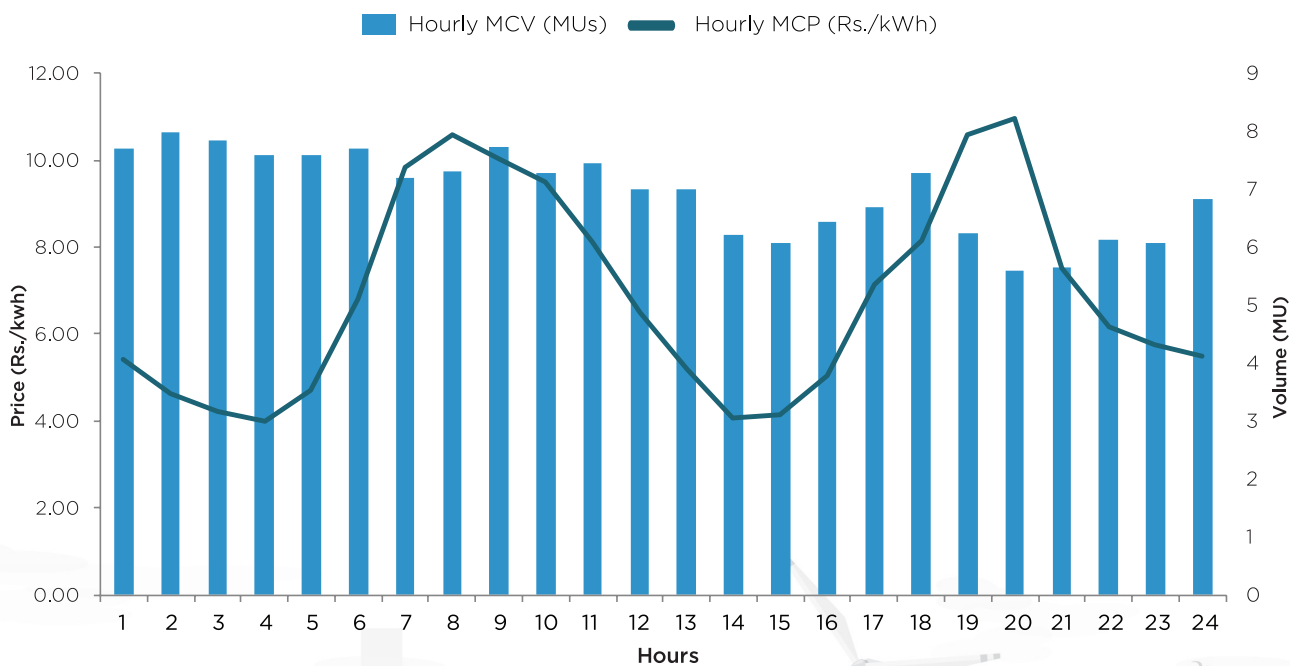
Contracts	Total Volume (MU)	Max. Price (₹/kWh)	Min. Price (₹/kWh)
Intra-Day	0.520	12.00	8.70
Day-Ahead Contingency	679.65	12.00	2.94
Daily	108.00	7.20	7.20
Weekly	0.00	0.00	0.00
Monthly	165.84	7.80	5.18
Total TAM Volume	954		

DAY-AHEAD MARKET

Daily Trade Details



Average Hourly Market Clearing Volume and Price

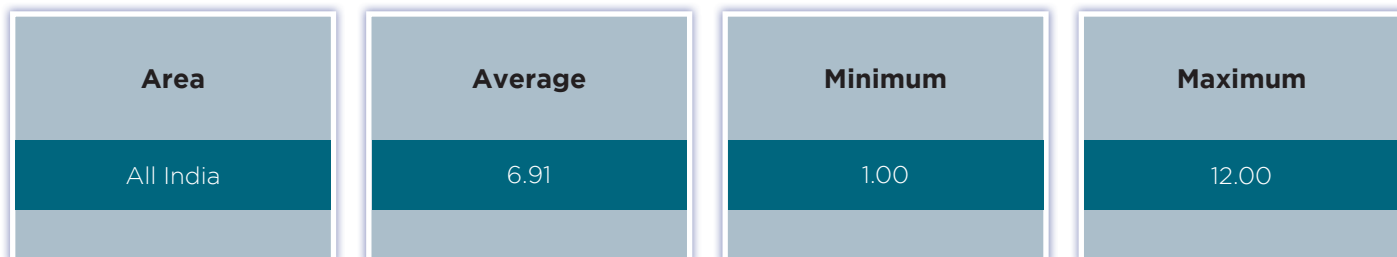




REAL-TIME ELECTRICITY MARKET: ANALYTICS

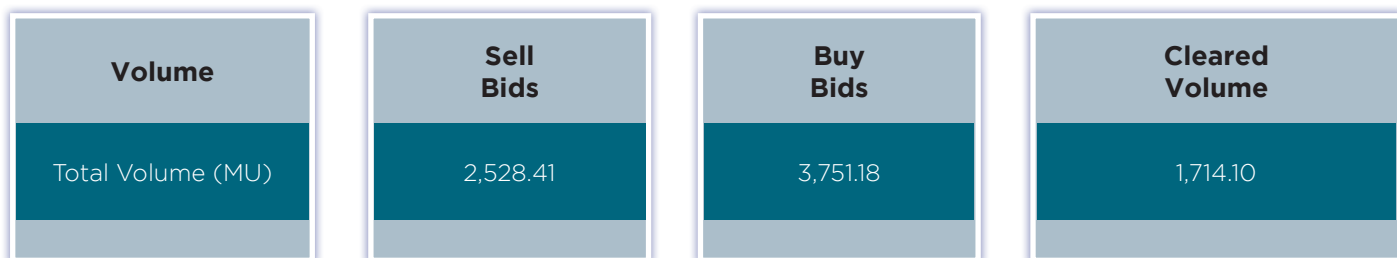
Area Prices

Price Snapshot (₹/kWh)

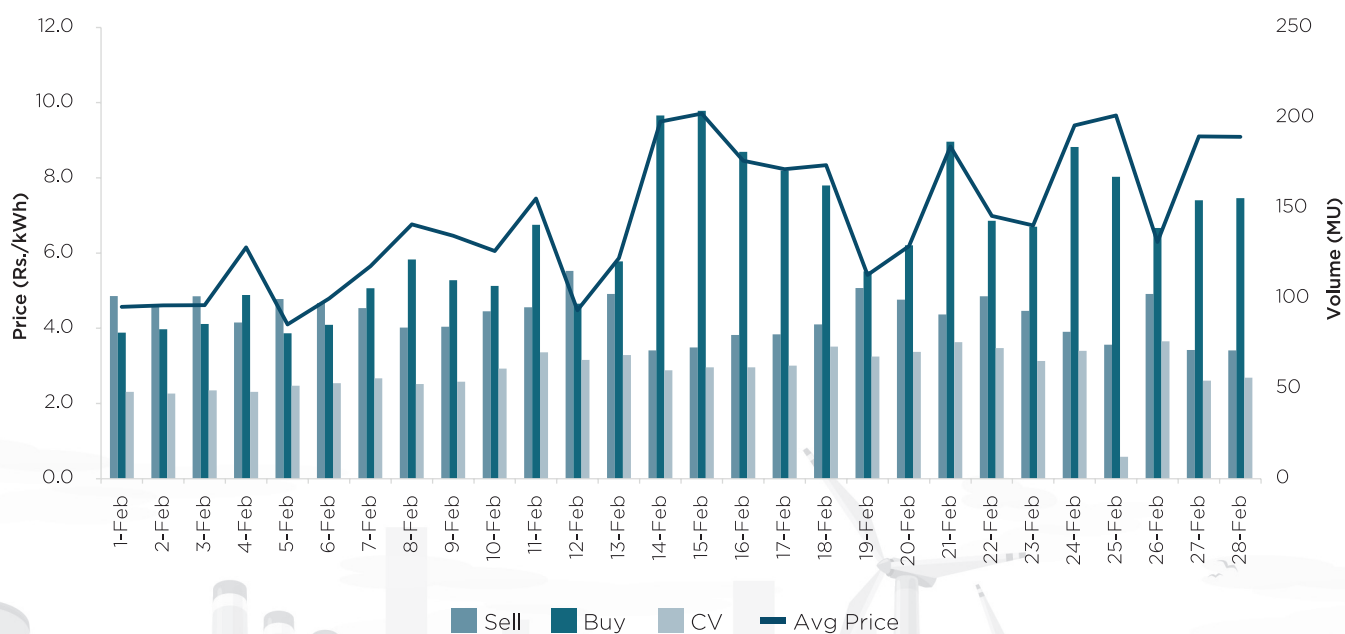


VOLUME

1 MU = 1 Million kWh = 1 GWh



Daily Trade Details



GREEN MARKET

GREEN DAY-AHEAD MARKET

AREA PRICES

Price Snapshot (₹/kWh)

Area	Average	Minimum	Maximum
All India	6.96	3.24	12.00

VOLUME

1 MU = 1 Million kWh = 1 GWh

Volume	Sell Bids	Buy Bids	Unconstrained Volume	Cleared Volume
Total Volume (MU)	296.32	1,238.36	250.42	250.42
Average Daily (MU)	10.58	44.23	8.94	8.94

GREEN TERM-AHEAD MARKET

	Intra-Day (Solar)	Intra-Day (Non-solar)	Intraday (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)	-	-	-	-	78.85	9.45	-	-	-	5.40
Price (₹/ kWh)	-	-	-	-	8.32	10.18	-	-	-	6.52
Total Volume (MU)	93.7									



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