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Power Chronicle

Editorial

Market based price discovery is primarily an outcome of demand and supply. Short-term supply constraints such as inadequate fuel supply, demand variation due to changes in weather conditions and variability associated with renewable energy generation influences the outcome. Spike in the discovered electricity prices on the Indian power exchanges, led the CERC to impose a price cap of ₹12/kWh in all the market segments. EAL, Vol. 05 Issue 01 of Power Chronicle, opined on the need and the efficacy of the measure, especially its long-term influence on the market. Thus, necessitating a dynamic framework for resource adequacy and development of a capacity market. The short-term measure of price cap is being followed with the introduction of a separate market/new product for costly power, as High Price Market Segment for the Day Ahead Market (HP-DAM). The economic efficacy, operational issues and the impact on competitiveness and liquidity necessitate a thorough analysis of the proposed market segment.

Flexible operation of the power system would play a crucial role in ensuring integration of larger variable renewable energy capacity. Grid flexibility can be contributed by the conventional plants through lower technical minimum operation and high ramping capability, while economical storage, better forecasting and real-time demand response also play a very important role towards the same. Power system operating conditions often do not require a uniform level of flexibility from all types of thermal generators ranging from low to high energy charge. EAL suggested that the efficacy of a uniform requirement of 2% ramping requirement for all coal-based power generators may not be economically desirable as low-cost generators are expected to operate with near full declared capacity (DC) and are expected to contribute less to the flexible operational need of the grid. A staggered approach to investment in enhancing flexibility of the existing generators should be limited to those generators which fall at the margin of merit order or have a higher variable cost which is required to operate at technical minimum levels.

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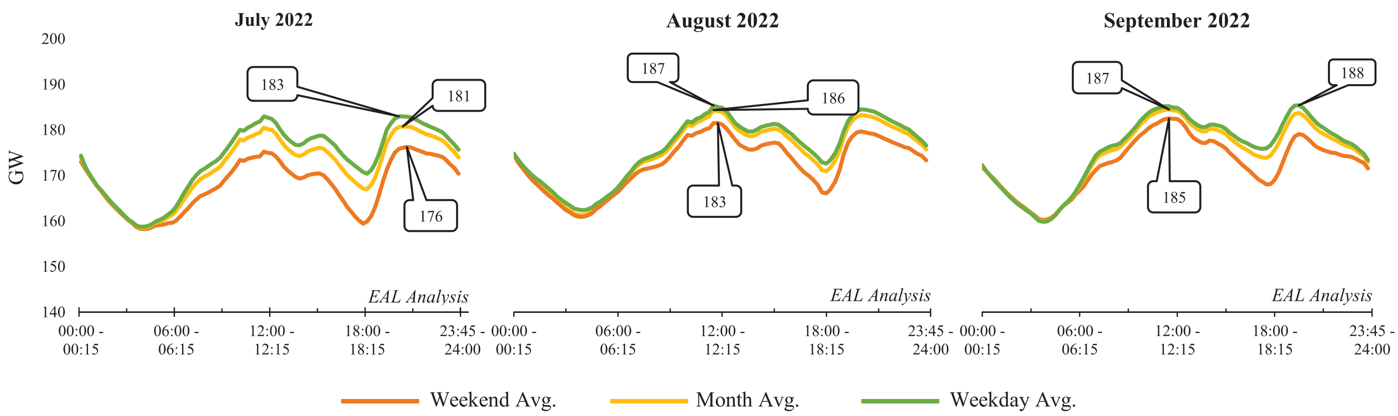
Stay Home, Stay Safe.

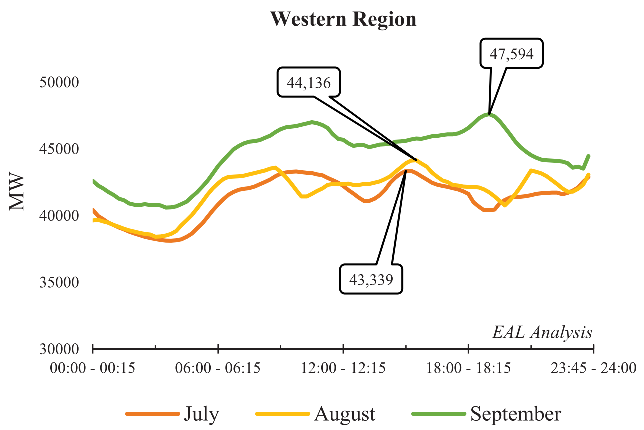
Power System Overview & Analysis

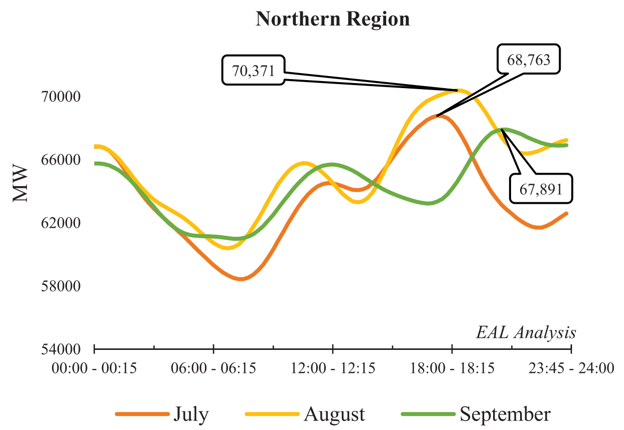
All India Demand Met Profile

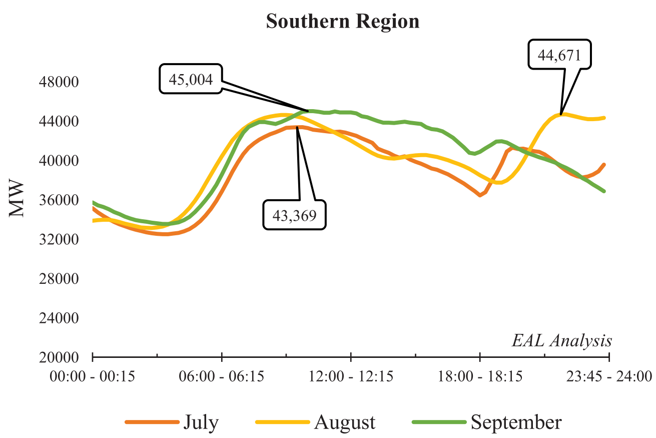


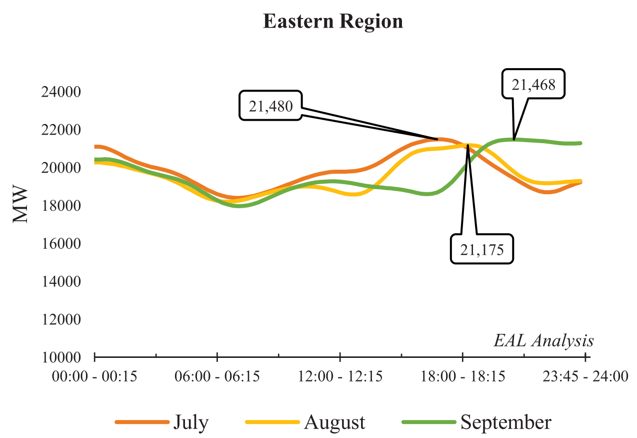
From July to September quarter, all India peak demand reached 202.5 GW (11:45 - 12:00) on 10th September, 2022, about 1% higher than the previous year's peak demand recorded at 200.5 GW (12:00 - 12:15) on 07th July, 2021, during the same quarter.

Region-wise Demand Met Profile









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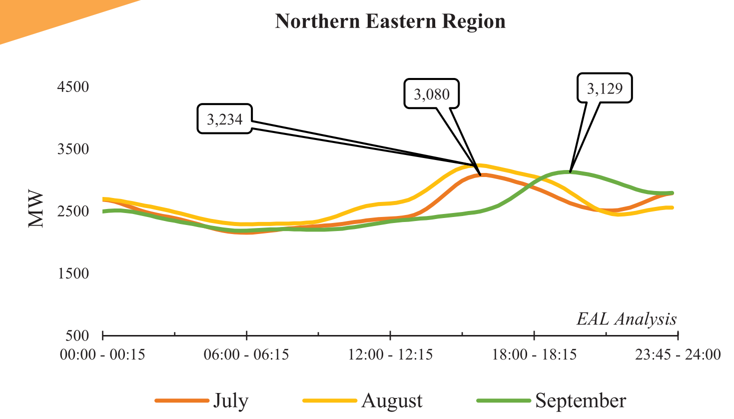
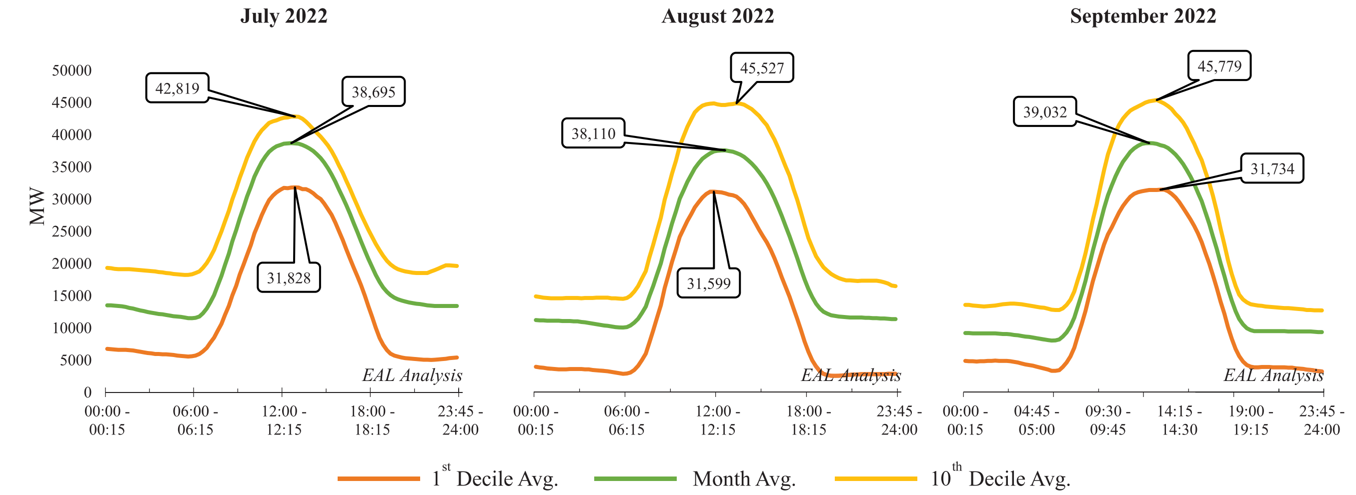


- Significant increase in demand can be observed in the month of September for the Western Region when compared to other two months. The average demand met by Northern Region is higher as compared to other regions for this quarter.
- Significant rise in the demand can be observed during the time between 13:00 – 15:00 hours for North Eastern Region in the months of July and August.

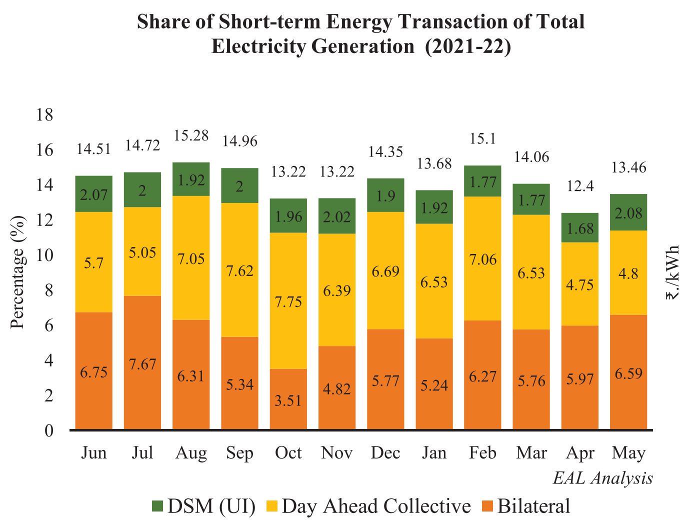
Demand and generation profiles at national, regional and state-level can be accessed on EAL's web portal.

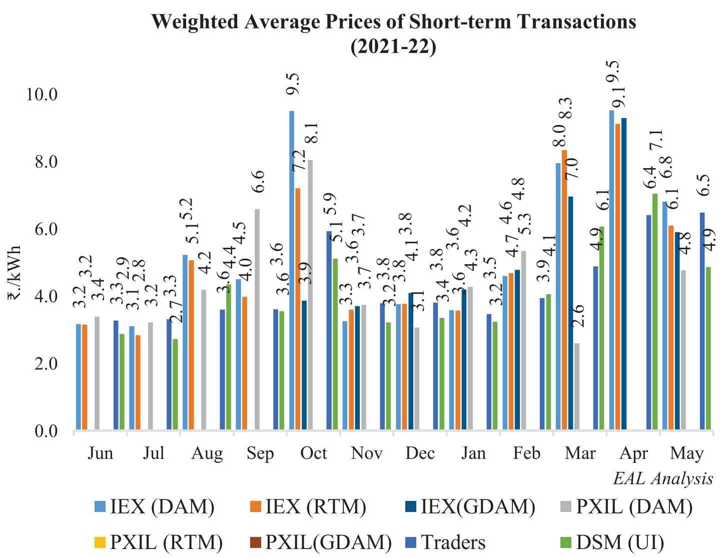
All India Renewable Energy (RE) Generation Profile



All India peak RE generation reached 48.12 GW (13:15 - 13:30) on 23rd August, 2022, about 12.77 % higher than the previous year's peak of 42.67 GW (12:30 – 12:45) on 27th July, 2021 during the same quarter.

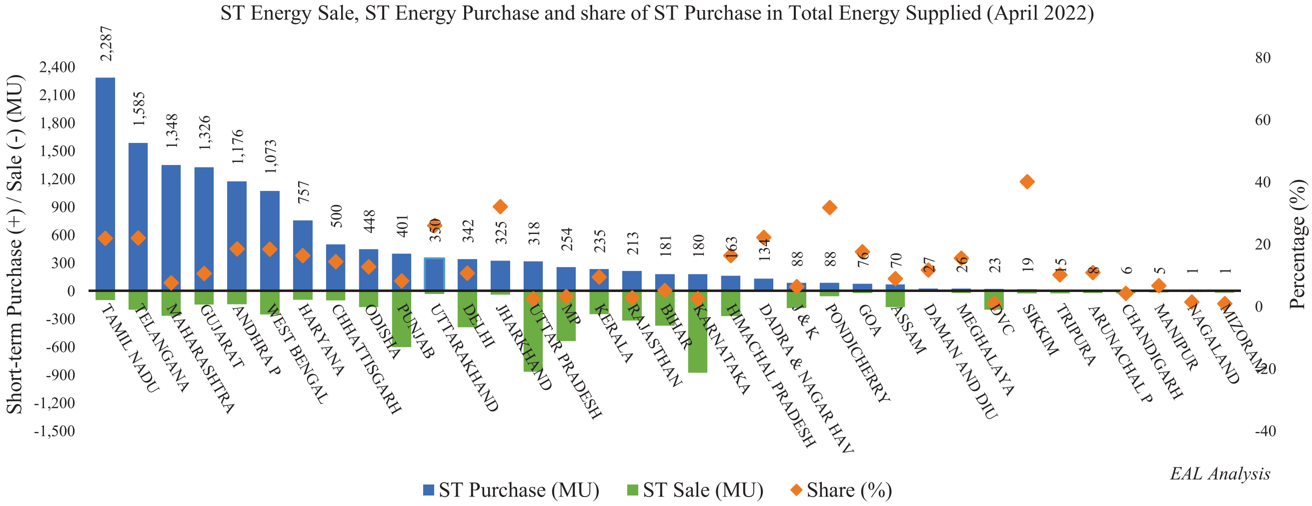
Short-term (ST) Energy Transactions



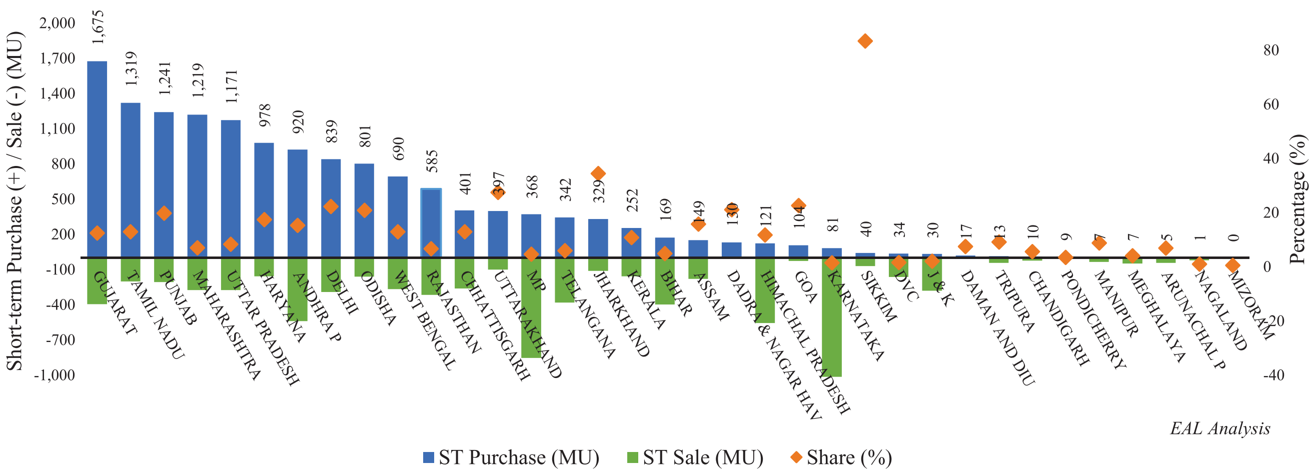


Monthly Short-term (ST) Purchase and Sale Quantum across States

ST Energy Sale, ST Energy Purchase and share of ST Purchase in Total Energy Supplied (April 2022)



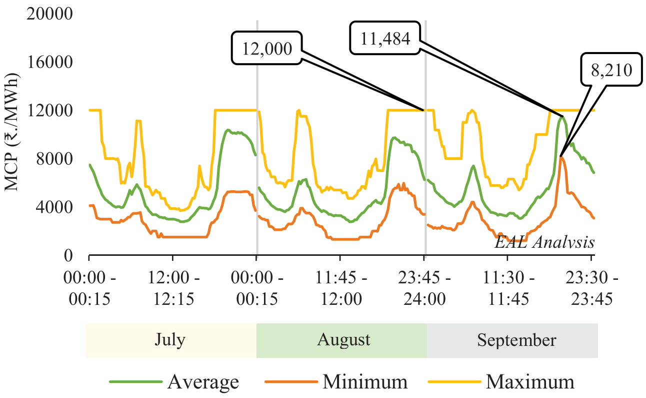
ST Energy Sale, ST Energy Purchase and share of ST Purchase in Total Energy Supplied (May 2022)



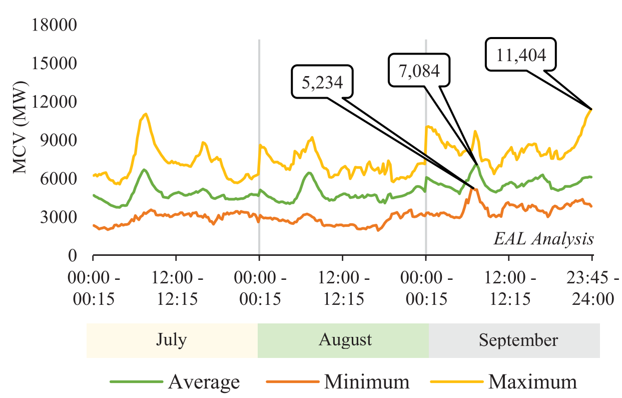
Power Market Overview & Analysis

DAM – Market Clearing Price (MCP) & Market Clearing Volume (MCV)

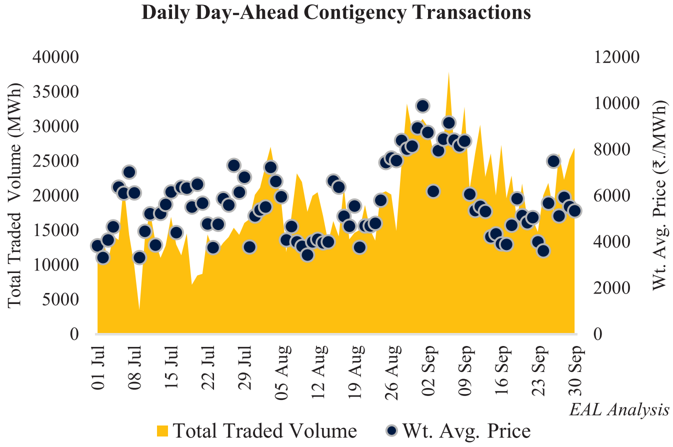
DAM Monthly Average, Maximum & Minimum MCP

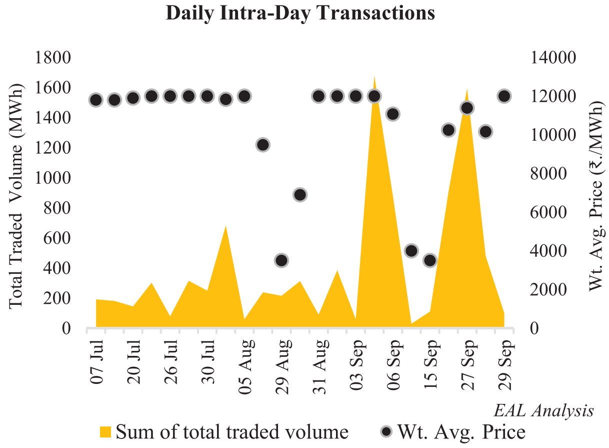


DAM Monthly Average, Maximum & Minimum MCV



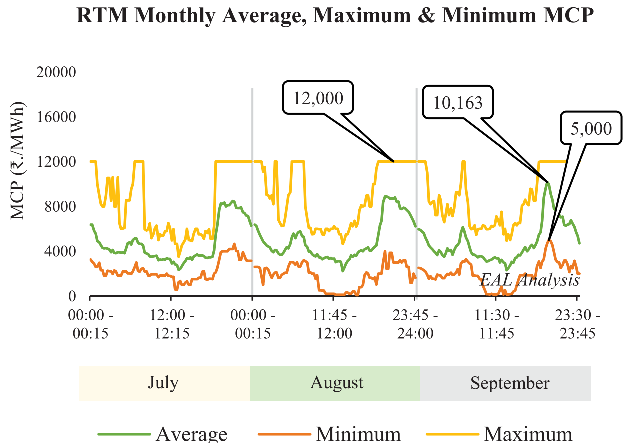
Term-Ahead Market (TAM)

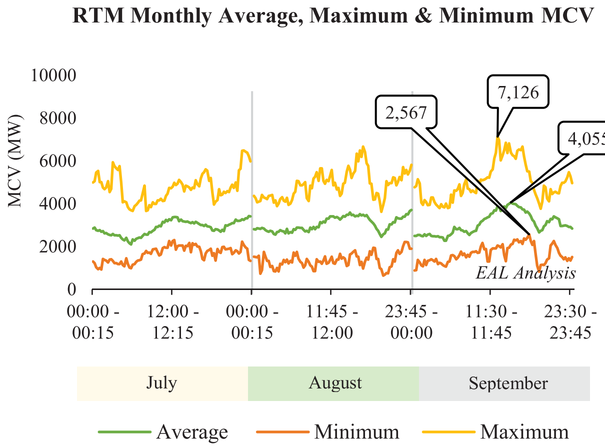




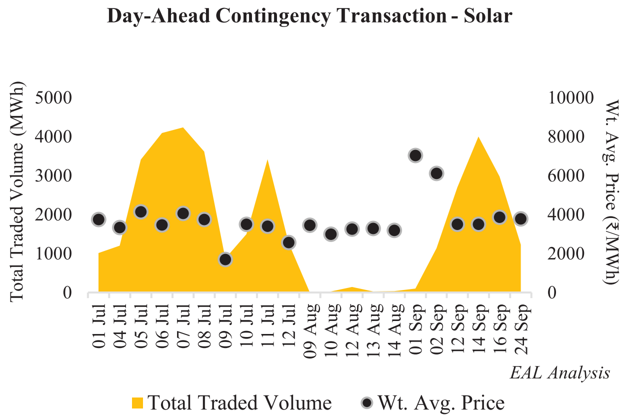
The total traded volume in Day-Ahead Contigency is much higher than the Intra-Day transaction but weighted average clearing price is lower as compare to Intra-Day Transactions during July to September quarter.

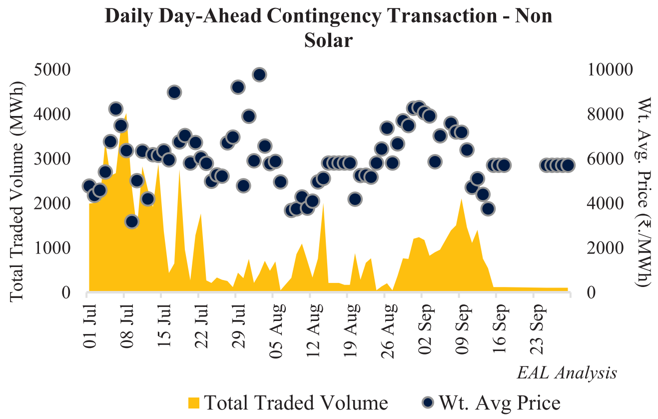
RTM- Market Clearing Price (MCP) & Market Clearing Volume (MCV)





Green Term-Ahead Market (G-TAM)





The total traded volume and weighted average clearing price of Non-Solar is higher in comparison to Solar in the Day-Ahead Transaction Contigency during July to September quarter.

Note: The above power market overview and analysis are based on the data from IEX Website

Regulatory & Policy Perspective

CEA (Flexible Operation of Thermal Power Plants)

Central Electricity Authority on 7th July, 2022 notified the draft on Flexible Operation of Thermal Power Plants Regulations, 2022. The key highlights of the draft are mentioned below:

- These Regulations shall apply to all coal and lignite based Thermal Power Plants (TPPs) and Load Despatch Centres (LDCs).
- Suitability of unit to operate for flexible operation:
  - Power plant unit throughout their service life shall be considered for flexible operation.
  - The start/stops and deep load following of corresponding unit shall be assessed.
  - The condition assessment of existing plant system and its upgradation if required.
- All TPPs shall be capable of providing the required output as per the schedule for generation finalized by appropriate LDCs.
- The appropriate LDCs shall schedule all coal based TPPs up to the Minimum Power Level (MPL) of 55%, to support the operation of must run stations. The appropriate LDCs may schedule all coal based TPPs up to the MPL of 40%, subject to the required modifications for suitability of plant in flexile operations to support the operation of must run stations.
- The minimum rate of loading or unloading for coal based TPPs shall be 3% per minute above the MPL. Provided that for supercritical and ultra-supercritical units, minimum rate of loading or unloading shall be 5% per minute above the MPL.
- Flexible operation of TPP should be implemented based on technical feasibility studies involving assessment of the following factors:
  - Rated capacity and minimum load design rating with no oil support.
  - Design ramp rate.
  - Influence of low load operation on components and systems.
  - Technical boundary conditions for flexible operation.
  - Combustion system optimization, co-ordination of mill and burner systems. TPPs may decide adoption of suitable modifications in consultation with concerned Original Equipment Manufacturers (OEM)/qualified consultants.

EAL Opinion

- **Necessity of Flexible Operation of Thermal Power Plants:** The increasing share of variable RE (VRE) places stress on the thermal generators, which need to respond to variability in demand as well as VRE generation. Adequate ramping capability, lower technical minimum, reduced startup and shutdown time of thermal generating units, particularly those based on coal and lignite, are crucial parameters for ensuring system security and stability amidst growing share of VRE.
- **Selection of TPPs for Investment to Enhance Flexible Operation:** Draft Clause No. 7 (i) states *"All TPPs shall be capable of providing the required output as per the schedule for generation finalized by appropriate Load Dispatch Centers. Based on the availability of must run stations, plants or units shall follow the variable load requirements"*.

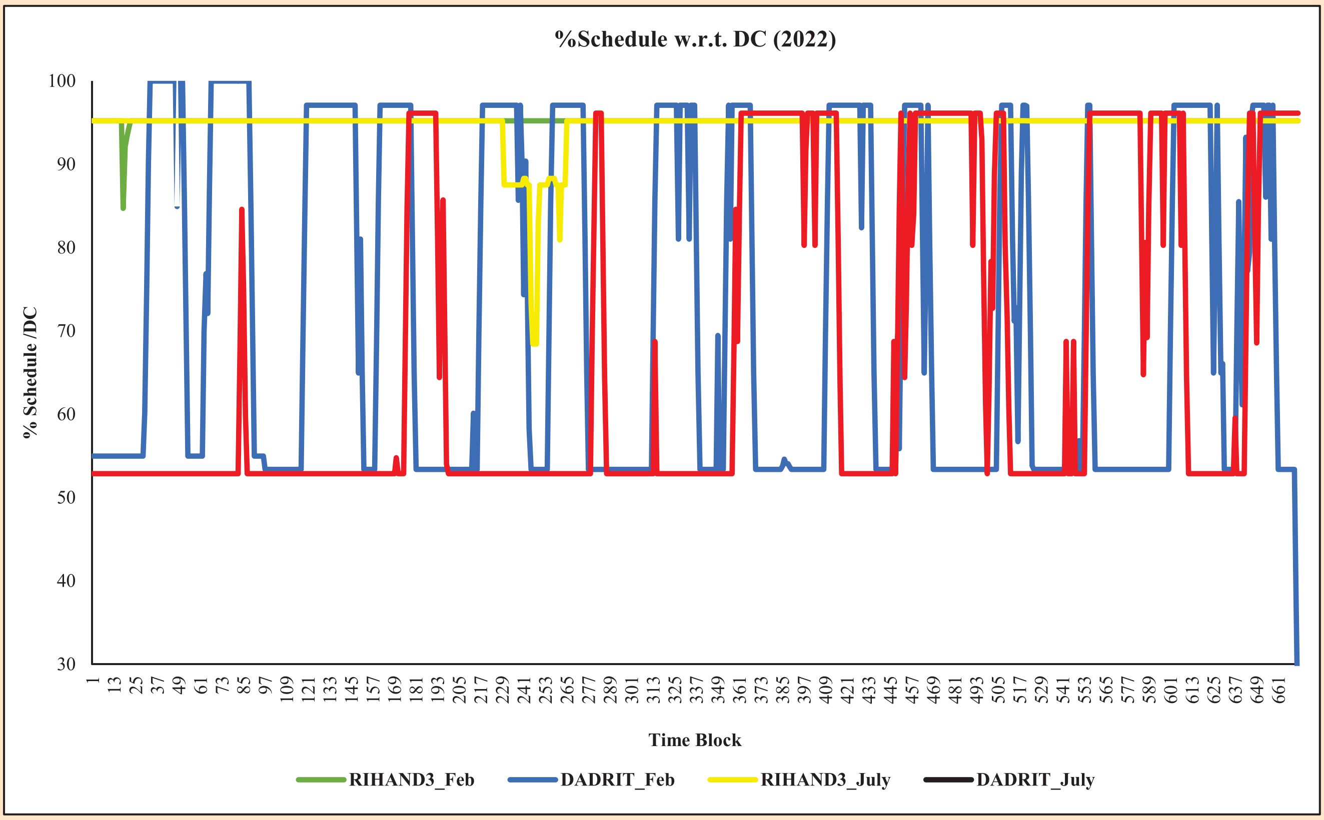


Figure 1: Comparison of Rihand (Low VC) and Dadri thermal plants (High VC)

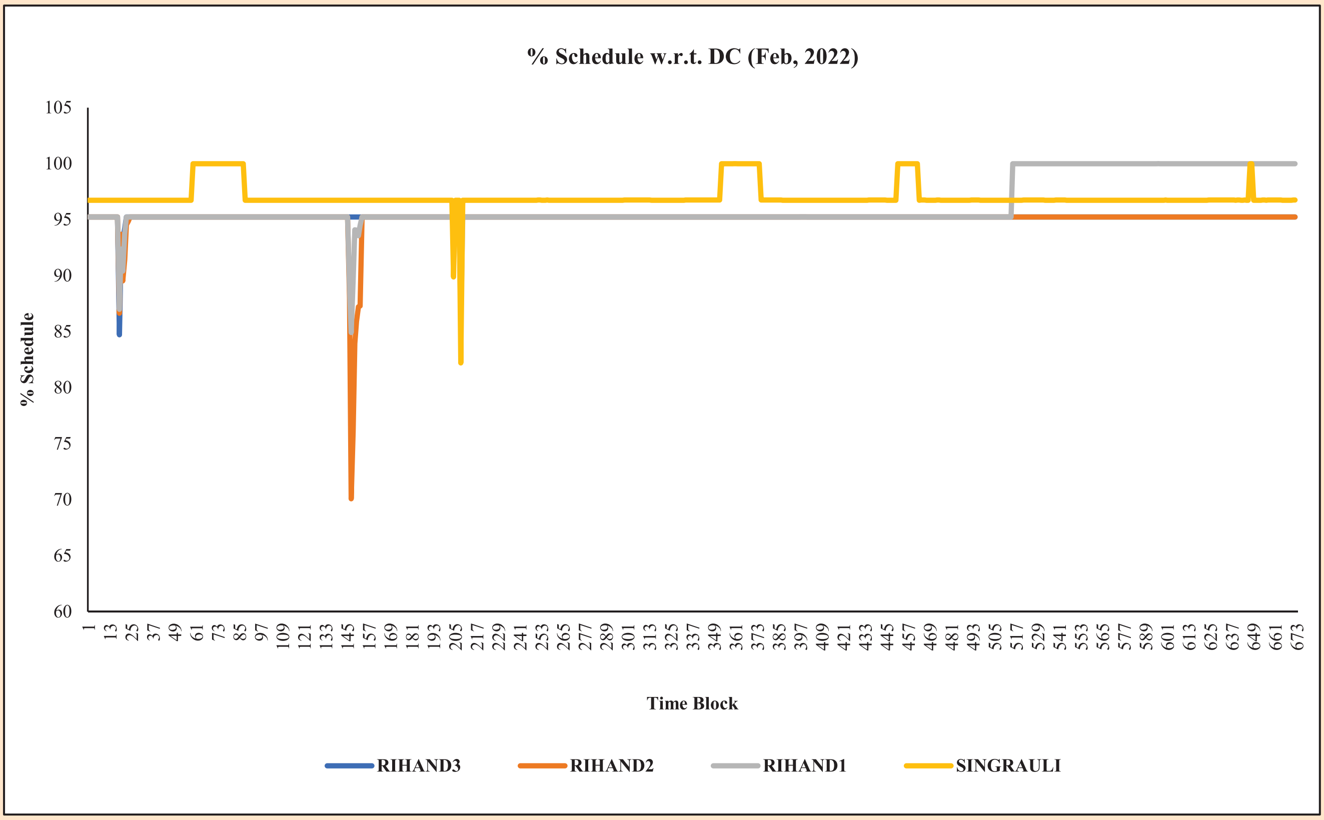


Figure 2: Scheduling of Low VC Thermal Power Plants for February, 2022

Figure 3: Scheduling of Low VC Thermal Power Plants for July, 2022

The *'flexibility'* in the power system can be contributed by various segments of supply as well as demand. The draft Regulation aims to enhance flexibility of thermal plants. This would require investment in such power plants. It is important to note that it may not be desirable to make investment in all TPPs across the merit order based on variable cost (VC). Note that low cost power plants are generally not required to demonstrate and deliver significant ramping capability but be limited to those which fall at the margin of the merit order. The later kind of plants are expected to demonstrate greater flexibility amidst growing share of VRE. The need for investment should focus on such plants. Otherwise the proposal would have high cost implications for the final consumers. It is further suggested that all new TPPs (COD not yet declared), if expected, should be mandated for implementation of measures for flexible operation of power plant.

EAL analyzed the percentage of schedule with respect to the declared capacity (DC) for ISGS Rihand (low VC) and Dadri TPS (high VC) for the first week of February and July, 2022. It was analyzed by Figure 1 that the schedule of Dadri TPS is changed more frequently as compared to that of Rihand TPS. Dadri TPS is scheduled at 55% of its DC, whereas Rihand TPS (lower VC plant) is operated near to its declared capacity during the period considered. Thus, it may be inferred from this analysis that the TPPs with higher VC are required to be retrofitted with the necessary modifications for flexible operation as compared to plants with lower VC.

From the Figure 2 and 3, it is observed that power plants with low VC are scheduled up to full DC most of the time, with few blocks witnessing up to 70% schedule. We can infer that economic value to the grid from investment in such plants may not be justified as compared to those requiring more flexible operation (with more ramping and lower technical minimum).

- **Staggered Timeline for Investment in Flexibility:** The proposed timeline aims to mandate all TPPs to be compliant with the Regulations to achieve higher flexibility in a period of about three years. A staggered target should be adopted to avoid bunching of the plant shutdown for extended period of time for retrofitting/modification leading to significant drop in the available capacity of TPPs. Newer plants of recent vintage, which would be more amenable to such a transformation due to available design detailing, availability of parts and possible recent experience, may be identified under the first set of target. The others should be mandated to do necessary groundwork in the meantime. Central sector plants, with relatively faster decision-making process, may be a further subset for first batch of rollout of the plan.

- **Definition for Cold, Warm and Hot starts:** Clause No. 2 (1) (e) states *"Cold start", in relation to steam turbine, means start up after a shutdown period exceeding 72 hours (turbine metal temperatures below approximately 40% of their full load values)."* Clause No. 2 (1) (h) states *"Hot start", in relation to steam turbine, means start up after a shutdown period of less than 10 hours (turbine metal temperatures approximately 80% of their full load values)"*, and Clause No. 2 (1) (u) states *"Warm start", in relation to steam turbine, means start up after a shutdown period between 10 hours and 72 hours (turbine metal temperatures between approximately 40% and 80% of their full load values)"*. It needs to be clarified if the additional characteristics added in the parenthesis are 'additional' or these are being mentioned for reference/clarification only.

- **Parameters for the Critical Point of Water:** Clause No. 2 (1) (p) states *"Sub-Critical Unit," in relation to coal or lignite based thermal generating unit, means a unit designed for main steam pressure less than the critical pressure (225.56 kg/ cm^2) of water"* and Clause No. 2 (1) (q) states *"Super-Critical Unit," in relation to coal or lignite based thermal generating unit, means a unit designed for main steam pressure more than the critical pressure (225.56 kg/ cm^2) of water".* Both these clauses mention the critical pressure of water at 225.56 kg/ cm^2. The technical definition considers both critical pressure and temperature of water[1]. So, it is suggested that critical temperature of water at 374^{o}C be included.

  The flexible operations of described using in Figure under Clause No. 5. The terminology referred to in the figure differs from that in the draft Regulations.

  The definitions of *"Minimum Power Levels (MPL)"* and *"Ramp Rate"* mentioned on Clause No. 2 (1) (j) & Clause No. 2 (1) (l) are given w.r.t. *"Maximum Rated Capacity"*, whereas the ramping capacity and the minimum load as illustrated in Figure 1 is given w.r.t to *"Normal Load"*. As such, it is suggested that either the figure may be re-drawn for the explanation in the given context or the source of the original figure may be mentioned in these Regulations. Furthermore, it is suggested to provide the definition of *'Normal Load'*, or refer to it in cased available in other relevant.

- **Incentives and Penalization based on RoE:** CERC's (Terms and Conditions of Tariff) Regulations, 2019 provides for additional RoE for higher ramping capability while penalising any short fall[2] POSOCO issued the detailed guidelines for assessment of ramping capability of ISGS in compliance of the above Regulations which indicated the provided the calculation for change in rate of RoE for achieving desired ramp rate.[3]

  EAL's analysis of the Guidelines for Assessment of Ramping Capability of ISGS issued by POSOCO-NLDC points towards at least five instances of relaxations in the overall framework. For example, 15% relaxation in measuring the proportion of time blocks having attained the ramping target in spite of the exclusion of the blocks under exigencies, ramp rate tolerance of 10% only for under-achievement of ramping target, and a minimum of 60-90 blocks/month (2-3 blocks/day) required to demonstrate the ramping capability.[4]

  The draft Regulations should relate the principle Tariff Regulations and Guidelines in terms of assessment of ramping capability and its relationship to the incentives and penalization based on RoE. Technical characteristics

[1] Sarkar, Thermal Power Plant Design and Operation, Chapter 2 – Steam Generators, Page 39-89 DOI: http://dx.doi.org/10.1016/B978-0-12-801575-9.00002-0

[2] Proviso (iii) to Clause No. 30 (2) of the CERC (Terms and Conditions of Tariff) Regulations, 2019 states the conditions for additional (reduced) RoE for achieving (failure to achieve) ramp rate of 1% min https://cercind.gov.in/2019/regulation/145-Gaz.pdf

[3] POSOCO (Detailed Guidelines for Assessment of Ramping Capability of Inter State Generating Stations), 2020 https://posoco.in/wp-content/uploads/2020/01/Ramp_Assessment_detailed-guidelines_6Jan2020.pdf

[4] EAL Comments on "Detailed Guidelines for Assessment of Ramping Capability of Inter State Generating Stations (ISGS)", Power Chronicle Vol. 03 Issue 04 https://eal.iitk.ac.in/assets/docs/Power_Chronicle_Vol_03_Issue_04.pdf

which are part of the original plant design should not attract any incentive for demonstrating a technical capability for which consumers are already paying the fixed charges.

The compensation for higher flexibility, if includes appropriate consideration for additional investment, should not attract additional incentive, but penalty in case such plants do not demonstrate the desired flexibility when required. It may also be suggested that the RoE incentives mechanism as per POSOCO Guidelines be revised in line with these Regulations, which considering the inputs provided herein. Alternative incentive/penalty mechanism should also be evaluated. For example those based on benchmark O&M cost.

- **Definition of 'Retrofit' :** The term *"Retrofit"* defined under Clause No. 2 (1) (m) hasn't been used anywhere in the draft Regulations. This term may be used under Clause No. 7 (v) as *'The thermal power plants shall retrofit the plant with necessary modifications'*. Alternatively, this term maybe omitted, if not required.
- **Cost Recovery of Investment for Flexible Operation of TPP:** To ensure that efficient and cost effective investments are undertaken by the TPP, a regulatory benchmark should be adopted in place of full pass through of costs. International benchmark studies, appropriately adjust for the factors like relative inflation, vintage, technology etc., may be considered for cost benchmarking in the Indian context. International competitive bidding remains the preferable choice to be adopted to ensure that cost of investment do not burden the final consumers.

Proposal of High Price Market Segment for Day Ahead Market (HP-DAM)

Ministry of Power on 1st August, 2022 notified the draft on High Price Market Segment for Day Ahead Market (HP-DAM). The key highlights of the draft are mentioned below:

- The issue of high price in spot market in Power Exchanges was addressed by CERC by introducing Price Cap of ₹ 12/kWh in all market segments in April, 2022. The only drawback due to market price capping was that the generators having high variable cost were unable to participate in the market.
- HP-DAM is proposed within existing Integrated-DAM as below:
  - **Eligible Sellers:** The sellers mainly involved in this segment will be those having variable cost greater than the price cap of ₹12/kWh. These can be gas based power plants, imported coal based power plants, etc. An NOC (No Objection Certificate) will be provided to such sellers biannually through NOAR (National Open Access Registry).
  - **Integrated HP-DAM:** HP-DAM operation will be analogous to G-DAM in I-DAM. The buyers will have option to carry forward their uncleared bids from DAM to HP-DAM. Also the buyers can directly place their bids in HP-DAM.
  - **Market Timeline:**

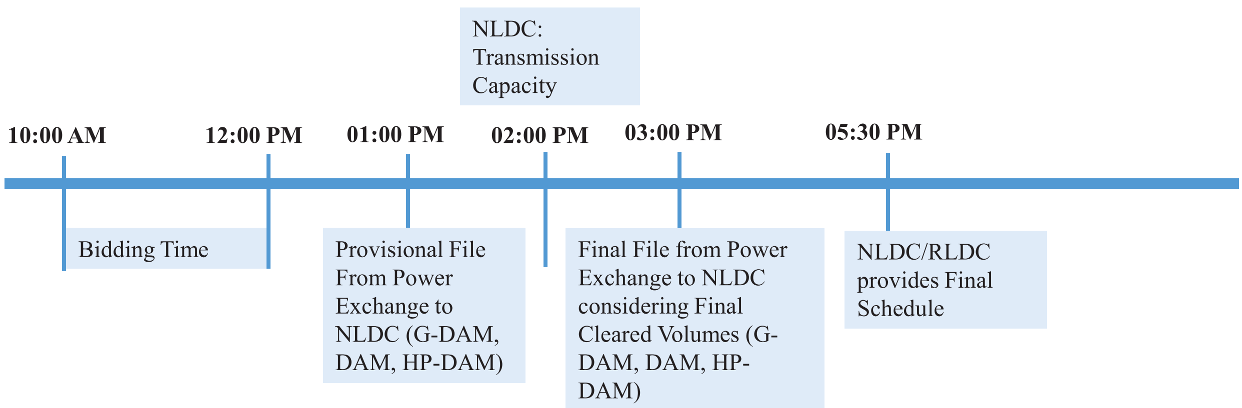


Figure 4: Timeline for HP-DAM

- **Bid Price Range:** The minimum price is 0 paise/kWh and maximum price will be decided by stakeholders feedback (higher than existing price cap for DAM).
- **Market Design:** It will be operating in parallel to the existing market operations.

Price Discovery: Double-Sided Closed Auction (similar to DAM, G-DAM, RTM)

This will enable the high cost power plant to be available during high demand period that was not possible previously. It targets only the buyers who are in deficit and can afford high price payment to participate in this segment. The other buyers will not get affected by operation of this additional segment.

EAL Opinion

Price Spike on Power Exchanges and Role of HP-DAM: Price spikes on the power exchanges over the past few months has been a cause for worry for the regulators as well as policy makers. This, along with the fact that some of the sellers would have made significant margins above their marginal cost (MC), may seem to have justified the idea of HP-DAM. However, the fundamental economic and implementation issues uncertainty about its long-term impact, while it may seem to result in some short-term benefits.

The fundamental reasons for the recent price behavior needs to be identified and addressed across the electricity supply chain, beginning with coal supply issues[5]. HP-DAM may be a temporary solution[6] that would likely alter bidding behavior as well as market outcome for DAM market segment itself. This is further explained below.

Uniform Market Clearing Price and Social Surplus: One of the key factors that perhaps led to the idea of HP-DAM is that the generators with low bids (read marginal cost) ended up garnering significant surplus (over their bid) due to uniform market clearing price. The fundamental nature of uniform market clearing price is the ability of the market to pass on price signals for investment particularly merchant capacity addition and demand response thus bringing long-term market efficiency. The surplus generated incentivises capacity addition thus avoiding/limiting future price spikes.

Addressing Price Spike – Supply Chain issues, Demand Response and Dynamic Pricing: Given the rising cost of power purchase across discoms and the financial state of electricity distribution companies, the efforts should be to minimize the overall financial impact for the discoms and the final consumers. As mentioned above, addressing coal supply issues, demand response and dynamic pricing can help address the issue of price spike.

Note that prior to price spike, the average prices remained around ₹3-3.50/kWh with peak prices hovering around ₹7-8/kWh at most. There was limited opportunity for high cost power to be traded on power exchanges and thus contributed little in terms of volume to the exchange traded products. The need for creating a niche market to allow participation of high cost generators is only a short-term solution. The addressing the structural problems in the electricity market design would provide a long-term solution for the same, and which would also be in the interest of the discoms as well as the consumers.

Low Liquidity Situation in HP-DAM: Market segmentation of DAM, by separating HP-DAM would lead to overall decline in liquidity especially when power shortages are minimal. In the absence of a mechanism, Apart from the above economic anomalies, may also face liquidity concerns especially when prices would be hovering around the cut off of ₹12/kWh and, hence, may lead to inefficient market outcome clouded by the concerns for market concentration and market manipulation.

[5] The editorial in the latest issues of Regulatory Insights, Vol. 05, Issue 01, Centre for Energy Regulation (CER) and Power Chronicle, Vol. 05, Issue 01, Energy Analytics Lab (EAL), highlighted these aspects.

[6] Introduction of HP-DAM may perhaps be the only case of power market, wherein a 'high price market segment' is proposed to be introduced. I am not aware of such an example, though these might exist.

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In case of price discovered being less than ₹12/kWh in the DAM, HP-DAM would not be executed, thus influencing liquidity/volumes on HP-DAM.

- **Pseudo Demand during Price Spike (at price cap):** In case the MCP reaches the unit price cap (earlier ₹20 /kWh as technical cap, or now ₹12/kWh as per CERC), and if the demand bids at price caps are more than the supply bids, a pro-rate approach is adopted for allocation of available supply volume across bidders at price cap. During shortages, the buyers knowing this mechanism would likely bid for higher volume than required so that they have a 'better' pro-rata share of MCV. This inflates the notion of 'unsatisfied' demand when market price touches price cap, and hence should not be construed to be that justifying better liquidity in HP-DAM. Such a behavior is generally observed when price cap is hit across multiple blocks over multiple days (Refer Figure 5, which presents data only for the blocks hitting price cap).

- **HP-DAM – A Dynamic Definition:** The key parameter defining HP-DAM is the price limit of ₹12/kWh (which may or may not be limited to the price cap set by the CERC).

  The definition of the market segment HP-DAM would remain dynamic as fuel supply situation (read, Gas price) rides over the international geo-political developments. In case the market price of gas falls significantly, HP-DAM would need to be redefined by lowering the price limit of ₹12/kWh. Six month is too long a period for the NOC for participation in HP-DAM. Given the dynamic international scenario (now as well as in future), the frequency for NOC approval may need to be a shorter one (perhaps in a gap on a month if required by the generator).

- **HP-DAM Generators participation in DAM at bids lower than the cut-off limit:** Will generators eligible to participate in HP-DAM be barred from participation in DAM with lower bids than ₹12/kWh? Such a situation may arise when variable cost of the generators hovers around ₹12/kWh and technical constraints may let it accept even lower rate for certain blocks of the day. The proposed design would exclude such circumstances.

- **Market for Flexibility Services and Role of Gas Based Generators:** The price of ₹12/kWh has resulted in exclusion of high variable cost generators from the power exchanges. Given the high gas prices, participation of such generators cannot be expected. Higher penetration of variable renewable energy in the power system necessitates need for flexible resources. Gas based power generation, storage technologies, demand response etc., can help bring this flexibility to the grid. Development of a market for such flexible resources as fast response ancillary services market is a more appropriate market platform. This also allows socialisation of such high cost resources if they can economically justify their value to the grid in terms of reduction in deviations and improvement in economics of overall cost of power procurement.

- **Spill-over Effect Leading to Higher MCP in DAM:** The proposed mechanism provides an option to the buyers in DAM to allow auto rollover to the HP-DAM. Since a buyer would not be sure of clearing its demand in DAM, it would tend to bid more than ₹12/kWh to allow for 'uncleared' bids to be rolled over to HP-DAM. In case a consumer chooses to bid below ₹12/kWh, there are no bids to be carried over to HP-DAM.

  Compare this with respect to a case wherein a buyer would participate in DAM (in the absence of HP-DAM). Knowing that the market has a cap of ₹12/kWh, a buyer would have no incentive to bid over this limit[7]. With the emergence of HP-DAM, to allow for auto-roll over from DAM to HP-DAM, a buyer would have to bid over and above ₹12/kWh. **This would raise the market clearing price (MCP) in DAM after the introduction of HP-DAM.** This is explained with the help of Figure 6.

  If design of HP-DAM provides for a choice of a premium for buy bids while a bid is carried forward from DAM to the HP-DAM segment, the above situation would not arise. **It is suggested that while rolling over of buy bids from DAM to HP-DAM, the buyer should have a choice of a premium while participating in the later (similar to I-DAM/G-DAM market).** The premium would have to be sufficient one so that the rollover bid crosses the ₹ 12/kWh limit.

[7] Since bids at ₹12/kWh as well as those above it are considered in a similar manner while making pro-rata 'clearing' for the buy volume, there is no incentive currently to bid over ₹12/kWh.

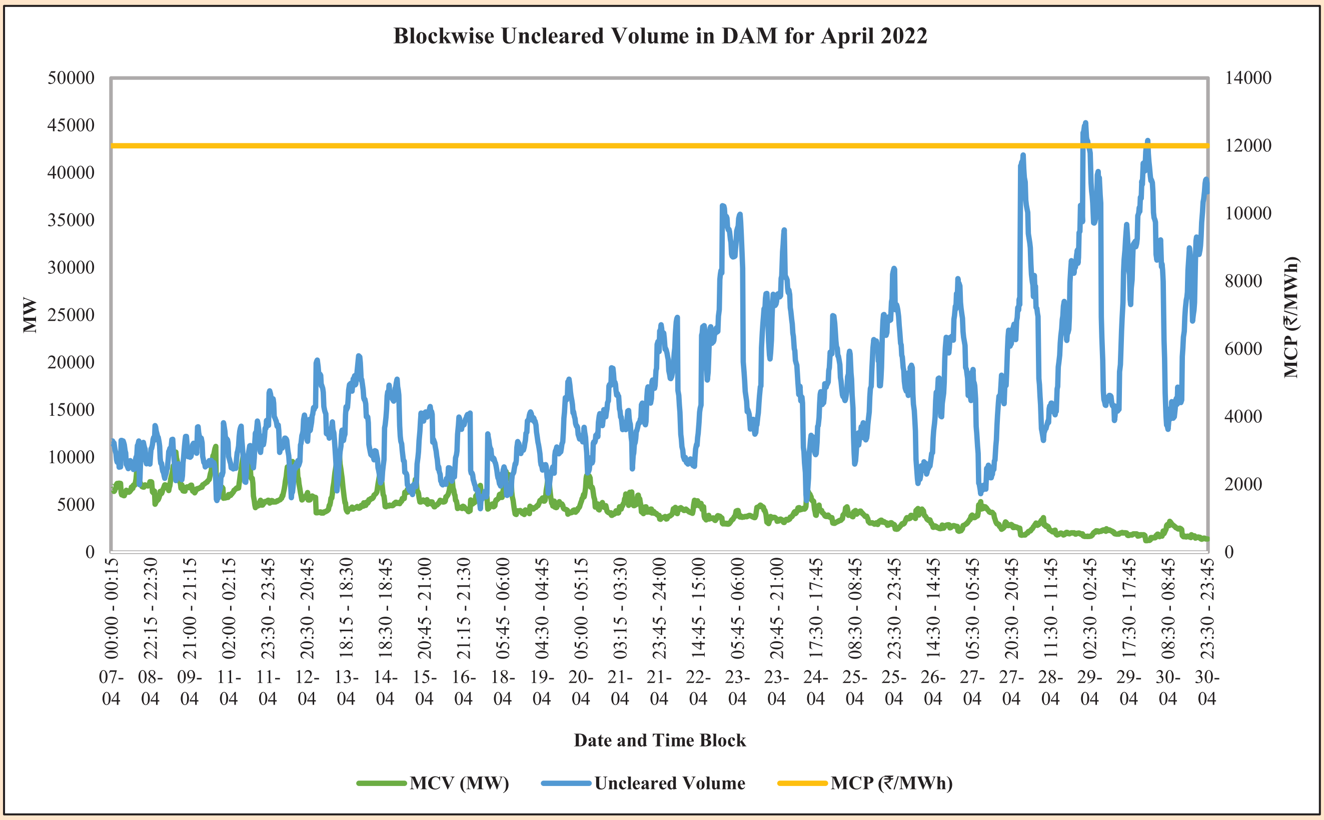


Figure 5: Block-wise Uncleared Volume and MCV for April, 2022 at MCP of Rs. 12/kWh

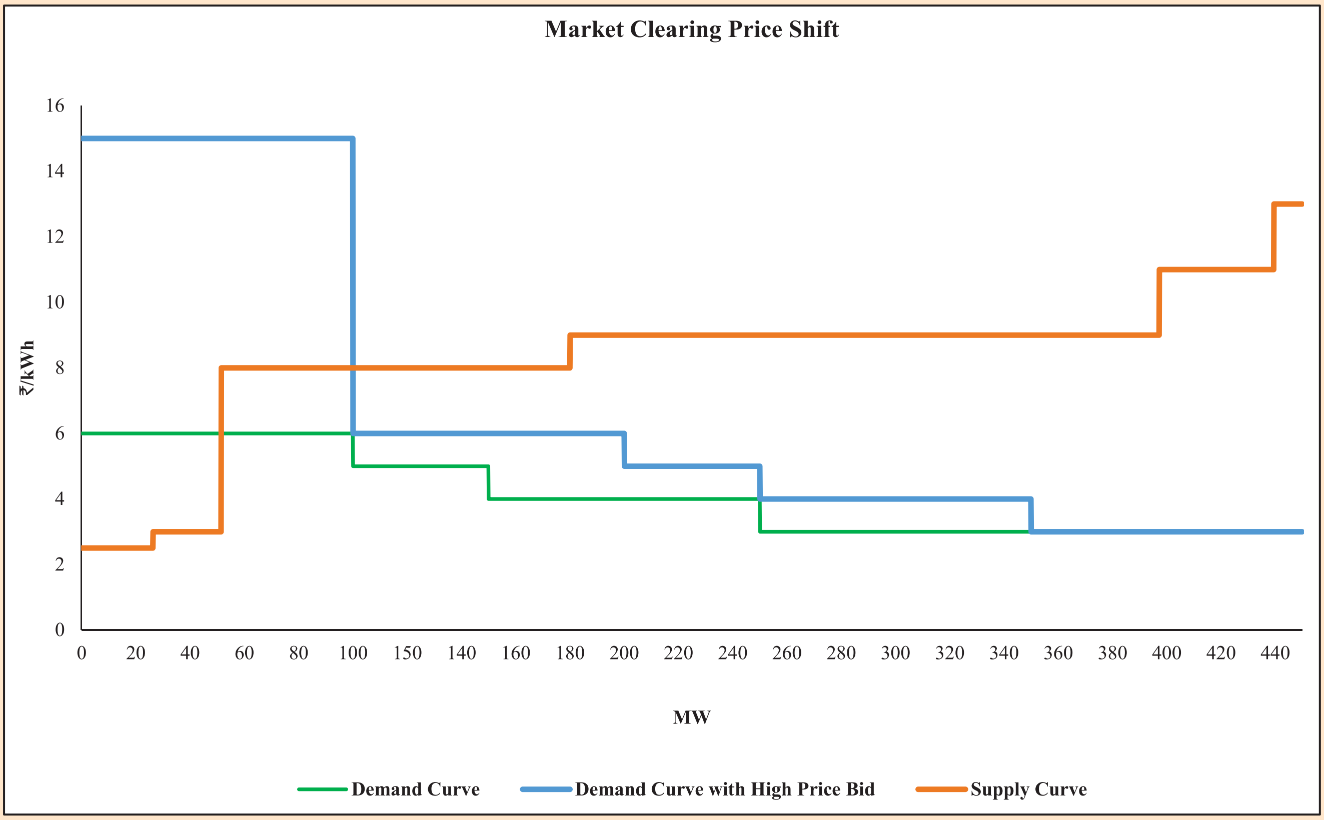


Figure 6: Higher MCP in DAM after introduction of HP-DAM with auto-rollover of buy bids from DAM

- **Eligibility of Sellers to Participate:** By design, participation criteria for generators is linked to the limit of ₹ 12/kWh. The eligibility for generators may be dynamic, especially for generators buying gas through short-term contract including that on the gas exchange with a resultant variable cost (fuel) to be around ₹12/kWh. A little short of it, they become ineligible to participate in HP-DAM.

  How would participation of buyers under PPA with gas-based generators be evaluated? Such buyers (read discoms) would like to offload their 'excess' and 'expensive' power on HP-DAM. What would be the eligibility criteria for such discoms to offload their power on HP-DAM? Since DC of such plants may vary on day-to-day basis, will there be a dynamic assessment of their eligibility? In its absence, a discom may profit by selling higher capacity at HP-DAM and compensate by 'demand management', thus effectively displacing a low cost power and 'selling' the same on HP-DAM.

- **Role of SERCs:** Given that price discovered in HP-DAM, due to its design, would always be higher than ₹12/kWh, SERCs may show conservatism in allowing participation in HP-DAM and instead mandate the discoms to take other measures to obviate the need for HP-DAM as far as feasible. This may reduce participation in HP-DAM.

  Given the poor financial liquidity with discoms, they would be required to provide advance funds to exchange in case they wish to consider 'roll-over' of their bids to HP-DAM. This would place persistent burden on discoms willing to participate in HP-DAM, especially when demand-supply situation may take the MCP near ₹12/kWh. Given the public ownership structure and the principle –agent problem, SERCs would have to put checks and balances to ensure that more cost effective options are implemented and exercised by the discoms.

- **Buyers would not place a Direct Bid on HP-DAM:** Knowing that a buyer may have lower MCP in the DAM segment and it has the option to rollover to HP-DAM, a buyer should not be directly bidding into HP-DAM. Otherwise, it may face the risk of buying higher price power in HP-DAM whereas it would have placed a bid in DAM with chances of getting clearing at an MCP lower than ₹12/kWh, else its bid would have been rolled over to HP-DAM.
  The statement *"Buyers can also directly place the bids in HP-DAM"* should thus be omitted.

- **Minimum zero price Bid in HP-DAM:** As proposed, the provision for zero price bid in HP-DAM may not be feasible. In case a bidder (even though having a VC above ₹12/kWh) decides to place a bid lower than its VC, it would be willing so in the DAM segment as well. In that it case, it would always get cleared in DAM and may not have enough volume left to be placed for HP-DAM. The provision for the same be omitted.

CERC (Sharing of Inter-State Transmission Charges and Losses) (First Amendment) Regulations, 2022

CERC notified the first amendment on Sharing of Inter-State Transmission Charges and Losses on 11th June, 2022. The major highlights of the draft are given below:

- The transmission charges shall be shared on monthly basis and will be incorporated according to the yearly transmission charges. Transmission Charges shall be paid by the drawal entities.
- Long Term Access and Medium Term Access is substituted as General Network Access (GNA) and Short Term Open Access is substituted as T-GNA respectively.
- The draft document modifies the Transmission Deviation Rate (TDR) per block in Rs./MW, for a State or any other DIC located in the State, during a billing month shall be calculated :
  TDR = 1.35 X (transmission charges for GNA in ₹)/ (GNA quantum in MW X days in a month X 96)
- Connectivity is granted to a Connectivity Grantee on existing margins and in case COD of such Grantee is delayed then Connectivity Grantee shall pay transmission charges from the start date of such Connectivity at the rate of Rs. 3000 /MW/month corresponding to the capacity that is delayed.

- For generating stations or sellers having no untied or untied LTA, reduce values of Marginal Participation Factors to zero.

EAL Opinion

- **Associated Transmission System:** Draft Clause No. 2 (1) (b) states *"Associated Transmission System' or 'ATS' shall have the same meaning as defined in GNA Regulations"*. It is suggested that the amendment proposed be modified to suit the current circumstances.

- **Principles of sharing Transmission Charges:** In the draft Amendment Regulations, Clause No. 3(3) states *"Bills for transmission charges shall be raised on the buyer in terms of this clause notwithstanding any provisions in the PPA and the settlement of the transmission charges inter se between the buyer and the generating station or the seller, wherever necessary, shall be made in terms of the PPA or as per the mutual agreement."* , and may be rephrased as "Bills for transmission charges shall be raised on the buyer in terms of this clause notwithstanding any provisions in the PPA ***and***, the settlement of the transmission charges inter se between the buyer and the generating station or the seller, ***wherever applicable,*** shall be made in terms of the PPA or as per the mutual agreement." The term "wherever necessary" may be replaced with "wherever applicable" to provide legal clarity.

- **First Bill:** Reference to the 'first bill' appears in Clause No. 11 (1), Clause No. 11 (6), Clause No. 12 (2) and Clause No. 13 (10), for calculations of reimbursements given to DICs for the Transmission charges collected from T-GNA, Transmission Deviation Rate, reimbursements in case of collection of charges due to delayed COD and calculation of transmission charges, respectively.

  Since the new Regulations would be applicable in the near future, the 'first bill', which is used to calculate some of the other charges, would not be available. In some cases, lagged applicability may resolve this. However, for the very first month, there is no advance knowledge of the first bill, unless defined in such a manner so that it is feasible to do so beforehand. Thus, applicability of the 'first bill' needs to be defined/clarified for the very first month of applicability of the Regulations.

- **Reimbursement of Transmission Charges for T-GNA:** Clause No. 11(6) of the draft amendments stating *" Transmission charges for T-GNA collected in a billing month, shall be reimbursed to the DICs in proportion to their share in the first bill in the following billing month."*, may be rephrased as *"Transmission charges for T-GNA collected in a billing month, shall be reimbursed, in the following billing month, to the DICs in proportion to their share in the first bill."*, for having more clarity.

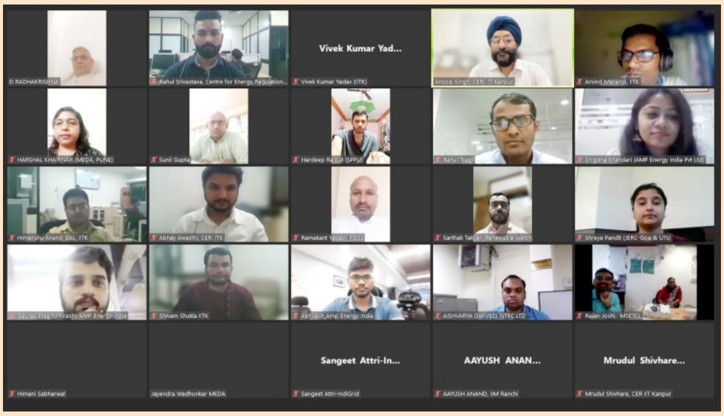
- **'Net Injection' with respect to a Generating Station with ESS:** If generating station having Energy Storage System, draws power from the grid for charging the battery or storage using pumped storage system, but actually injects energy at the end of the block, in such case drawal charges are not being considered.

  This drawal of power for charging battery/storage, will not get considered in case of net metered injection, as being the generating station, it may end up "net" injecting the power into the grid. From the point of uniformity in application of the Regulation, in such scenario, the drawal of energy should not be netted and be considered separately.

EAL News

Regulatory Certification Programme

CER organised **2nd Regulatory Certification Program on "Power Market Economics and Operation"** from 26th June 2022 to 10th July 2022. The program was designed to provide insights into the economic and operational aspects of the power market, its products, and its role in the Indian power market. This program was conducted under the aegis of the Centre for Continuing Education, IIT Kanpur. Mr. Surya Pratap Singh Parihar, Chairman, MPERC graced the valedictory session on 14th July 2022 along with other eminent speakers. The speakers included Mr. Sushil Kumar Soonee (Former Advisor, POSOCO), Dr. Anoop Singh (Professor, IITK), Ms. Shilpa Agarwal (Joint Chief (Engg.), CERC), Mr. Jogendra Behera (Vice President, IEX), Mr. Pradeep Jindal (Chief Engg, CEA) amongst many more.



CER's **1st Regulatory Certification Program (RCP) on "Renewable Energy: Economics, Policy and Regulation"** commenced on 7th October 2022 and was inaugurated by Mr. D. Radhakrishna, Chairman, TERC. The program is focused on the regulatory and policy frameworks for renewable energy development. Built on economic foundations, the program is enabled to provide a better understanding of evolving regulatory and policy frameworks for Renewable Energy (RE) to the participants, along with the opportunity to learn best practices from academic professionals, leading national and global experts, and to develop the ability to deal with practical problems such as RE generation forecasting, scheduling and dispatch. Further details about the program and other upcoming RCPs are available at https://cer.iitk.ac.in/olet/rcp .

The registration for the next batch of eMasters Degree Program in 'Power sector Regulation, Economics and Management' is open till 12th November, 2022. It is a multi-disciplinary program approved by the Senate, IIT Kanpur and the session for cohort – II will commence from 9th January, 2023. The program will provide a conceptual understanding of power sector regulation from economic, legal, environment and regulatory perspectives. Further details about minimum qualification, admission criteria, application process and course fee structure are available at https://emasters.iitk.ac.in/powersector .

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Other Initiatives

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