

Power Chronicle

Regulatory Framework for Ancillary Services and Deviation Settlement Mechanism

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Editorial

The growing share of renewable energy (RE) and uncertainty in electricity demand pose a significant challenge for secure and resilient system operation. Ancillary services play an important role in supporting the system operator in achieving these objectives. The ancillary services framework at the inter-state level enables provision of primary, secondary, and tertiary reserve ancillary services through mandated, regulated, and market-based frameworks. While intra-state entities are eligible to contribute to inter-state ancillary services, there is very limited participation. Technological capability, institutional inertia, and fear of losing 'right to schedule' remain some of the key impediments to the participation of intra-state entities.

To enable the Indian power system to absorb a greater share of RE while providing reliable electricity supply, a unified framework for grid code across the country at inter-state as well as intra-state levels is the need of the hour.

While each system control area can propose and implement an ancillary services framework, seamless harmonisation is required in the design, implementation, monitoring, pricing, and compliance related to the provision of ancillary services.

The deviation settlement mechanism (DSM), which evolved Unscheduled Interchange framework, is a unique innovation implemented in the Indian power system to address system deviations. While it has served its intended purpose for the inter-state system to a significant extent, much remains to be desired in its implementation at the intra-state level. The lack of harmonisation of the DSM framework at the two levels provides room for gaming by generators operating at both the inter-state and intra-state levels. This concern is heightened in the context of variable RE sources, which face significant deviations due to their dependence on local weather conditions and lack of reliable forecasts. DSM mechanisms must provide ample incentives/disincentives to ensure that such deviations are minimised by all entities, particularly the RE sources, which are playing an increasingly significant role at both inter-state and intra-state levels. Apart from improvements in forecasting RE generation, technological investments, including those aimed at collecting reliable data on local weather conditions, remain essential.

The intra-state DSM needs to urgently catch up with the growing penetration of RE and reduce the financial burden of their imbalances on DISCOMs, which then pass on this burden to end consumers.

The ultimate goal should be to ensure that a vibrant framework for ancillary services takes over system balancing once the requisite effort has been undertaken by the system constituents. While such costs for ancillary services would be socialised, efforts of the power system constituents can be nudged through an effective DSM framework.

Anoop Singh (Editor)

Founder & Coordinator, Energy Analytics Lab

Keywords: Ancillary Services, SRAS, TRAS, Grid Code, Automatic Generation Control, Energy Storage System, Ancillary Service Market, Deviation Settlement Mechanism, Open Access, Gaming, Demand Response, Grid Balancing, Regulatory Harmonisation



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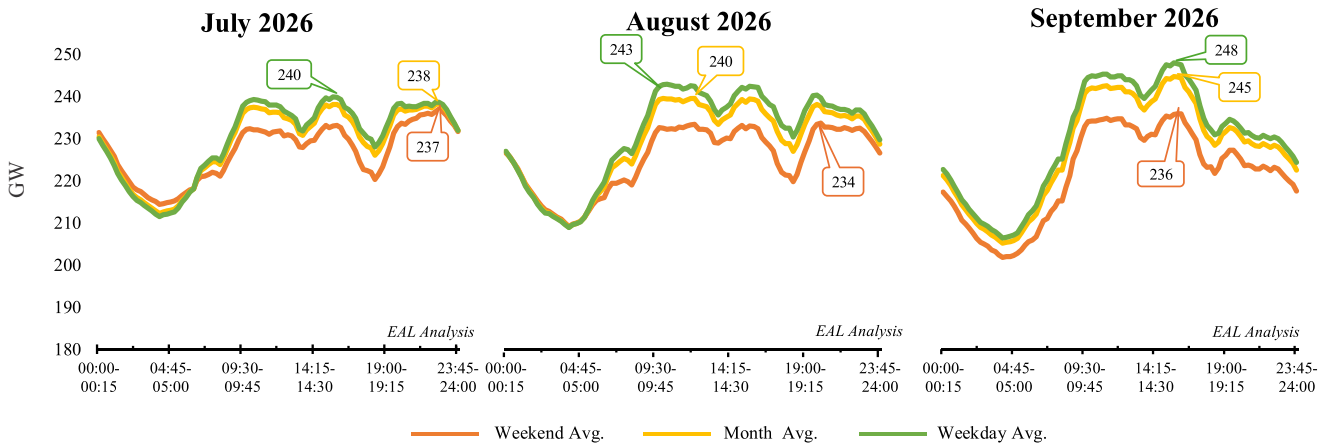
Department of Management Sciences

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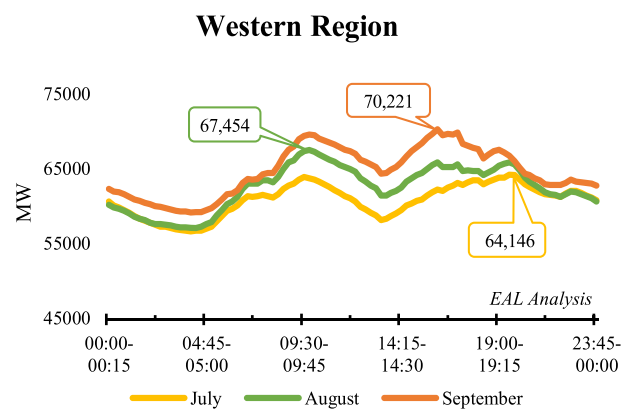
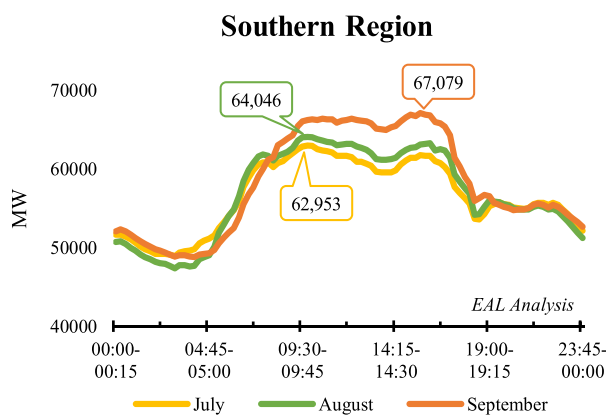
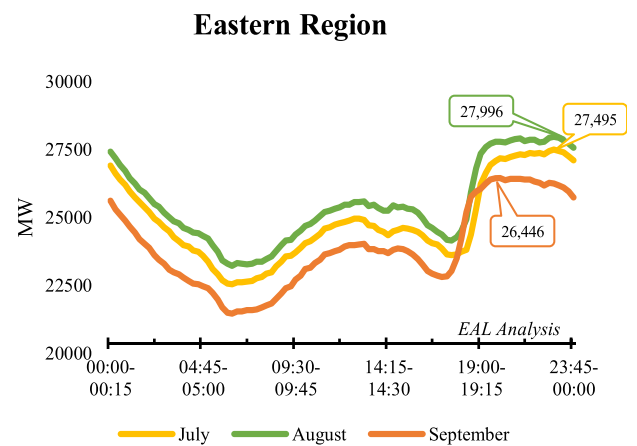
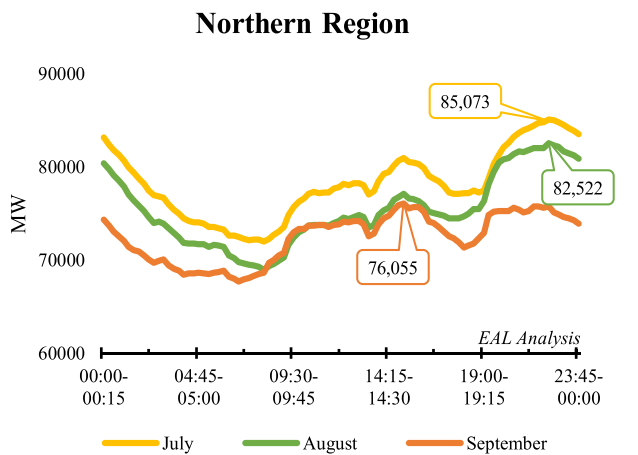
Power System Overview & Analysis

All India Demand Met Profile

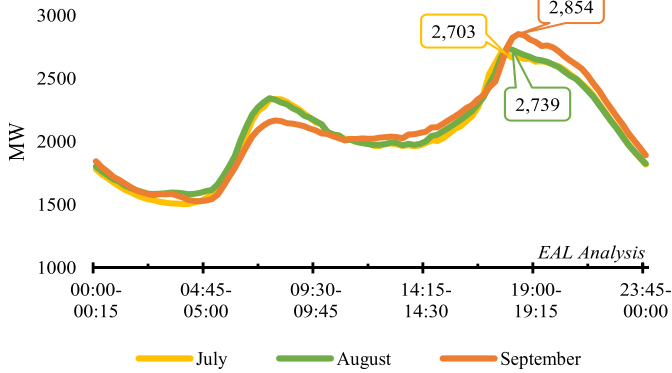


From July to September quarter, all India peak demand reached 270 GW (15:00 - 15:15) on 16th July, 2026, about 11.5% higher than the previous year's peak demand recorded at 242 GW (19:15 – 19:30) on 7th September, 2025, during the same quarter.

Region-wise Demand Met Profile



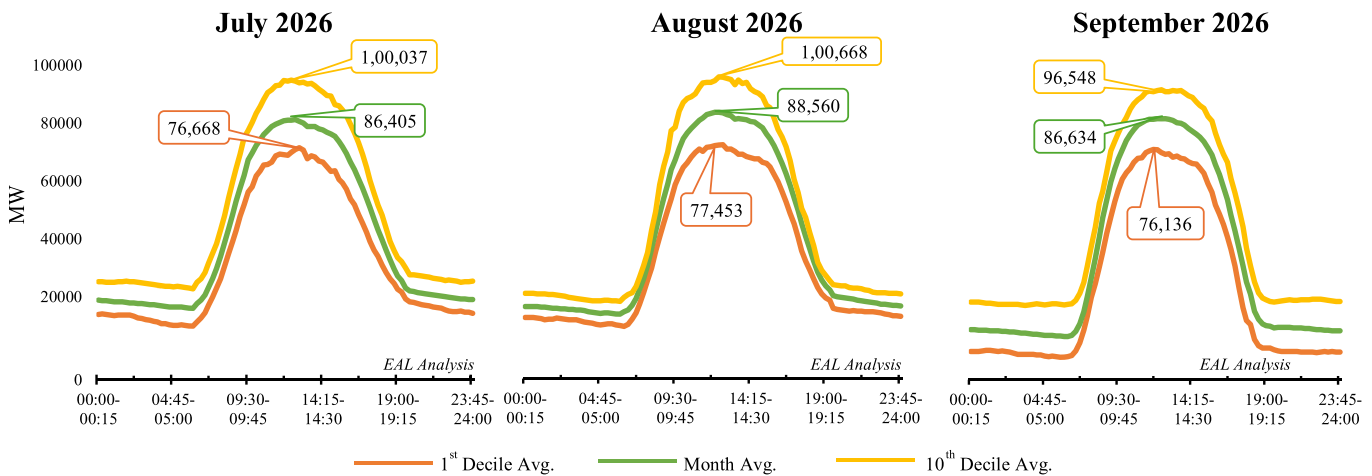
North Eastern Region



- Significant increase in demand can be observed from 19:00 to 20:45 hrs for Northern Region and 04:45 to 08:45 hrs for Southern Region in all three months respectively.
- Significant decrease in demand can be observed for Northern and Eastern regions from 00:15 to 04:15 hrs in all the three months respectively.
- Average demand is found to be higher for Southern and Western region as compared to the other regions in the month of September.

Demand and generation profiles at National, Regional and State-level can be accessed on EAL's web portal.

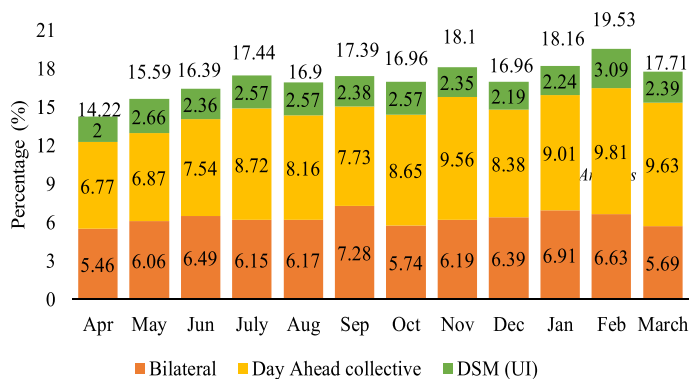
All India Renewable Energy Generation Profile



All India peak RE generation reached 105.21 GW (12:30 - 12:45) on 27th August, 2026, about 33.5% higher than the previous years' peak of 78.80 GW (12:15 - 12:30) on 27th September, 2025, during the same quarter.

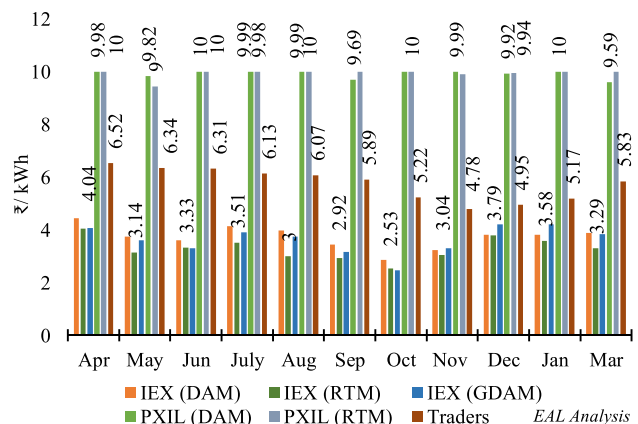
Short-term Energy Transactions

Share of Short-term Energy Transaction of Total Electricity Generation (Apr 2025 - Mar 2026)



EAL Analysis

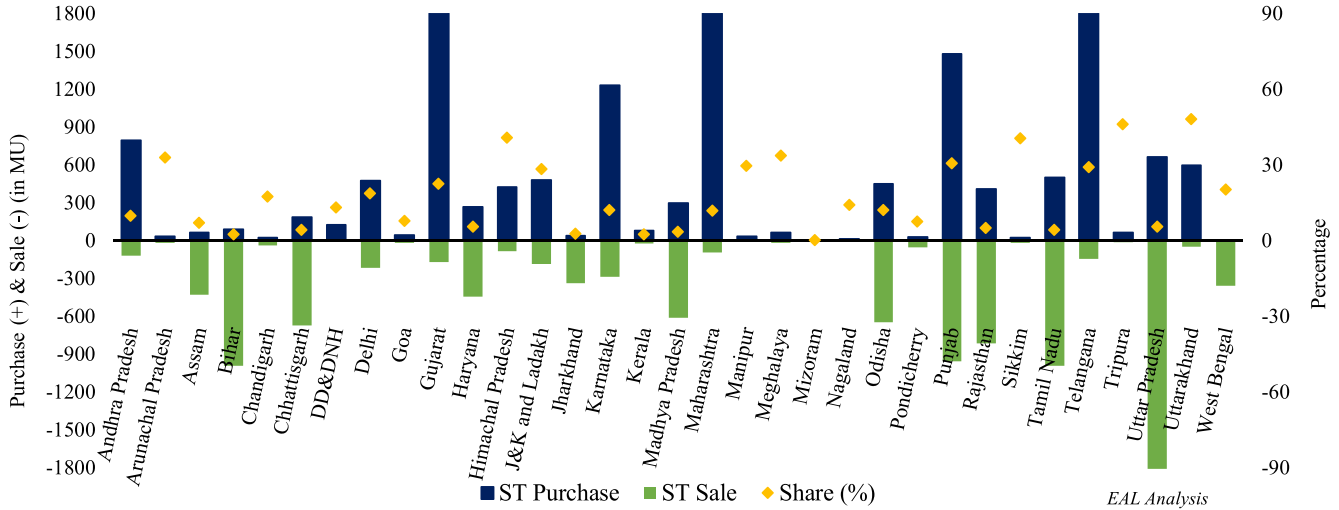
Weighted Average Prices of Short-term Transactions (Apr 2025 - Mar 2026)



EAL Analysis

Monthly Power Purchase and Sale Quantum through Power Exchange across States

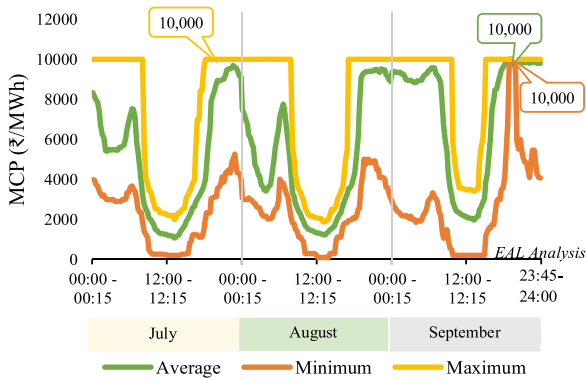
ST Energy Sale, ST Energy Purchase and share of ST Purchase on Total Energy Supplied (March 2026)



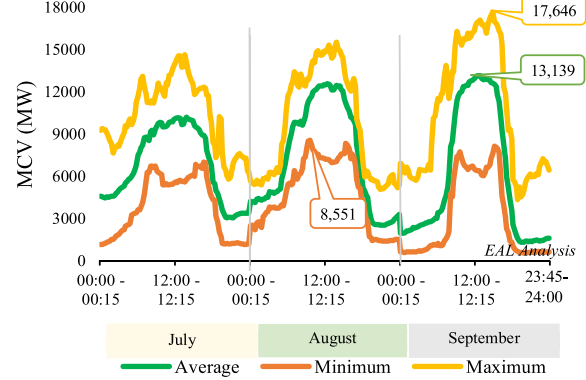
Power Market Overview & Analysis

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

DAM Monthly Average, Maximum & Minimum MCP

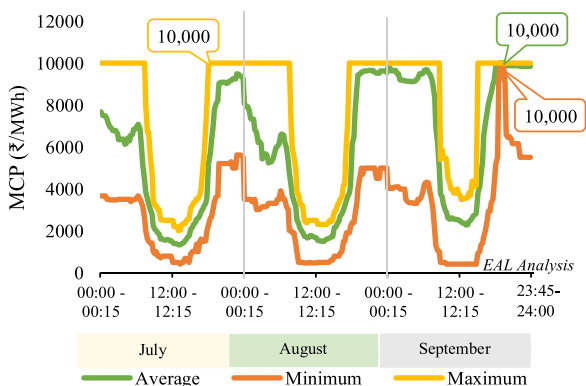


DAM Monthly Average, Maximum & Minimum MCV

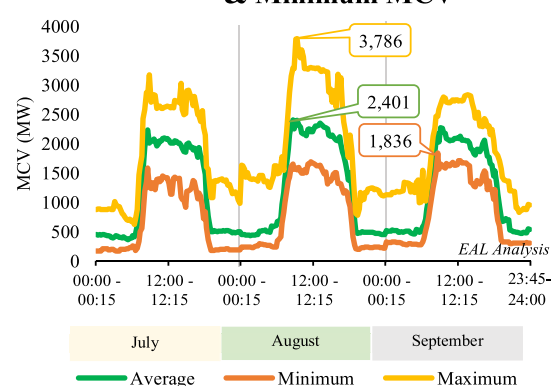


G-DAM Market Clearing Price (MCP) & Market Clearing Volume (MCV)

G-DAM Monthly Average, Maximum & Minimum MCP

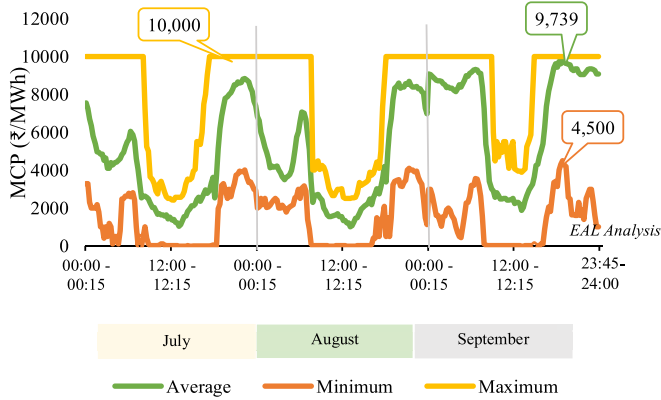


G-DAM Monthly Average, Maximum & Minimum MCV

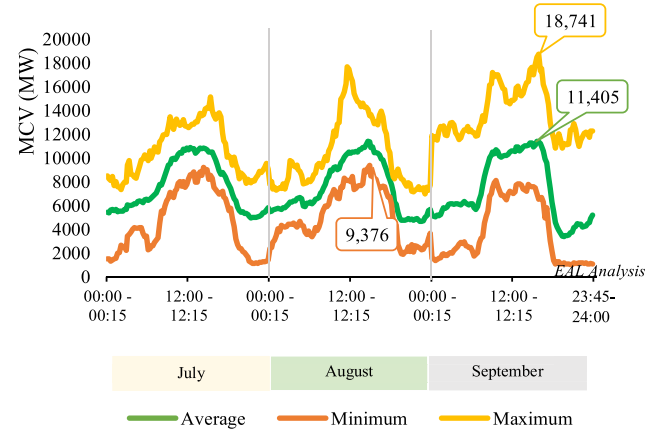


RTM -Market Clearing Price (MCP) & Market Clearing Volume (MCV)

RTM Monthly Average, Maximum & Minimum MCP

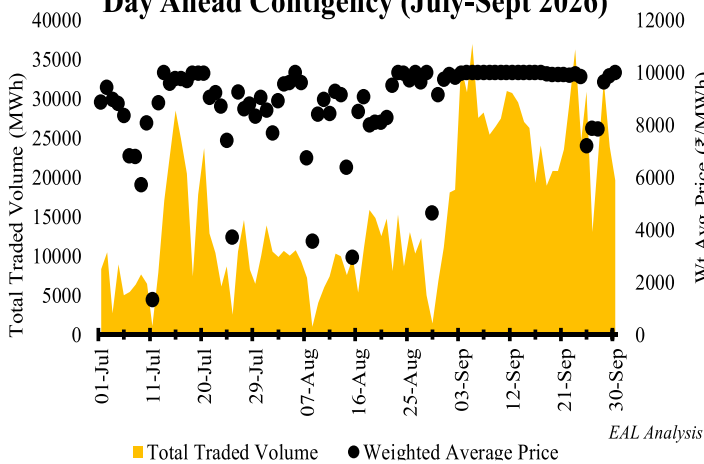


RTM Monthly Average, Maximum & Minimum MCV



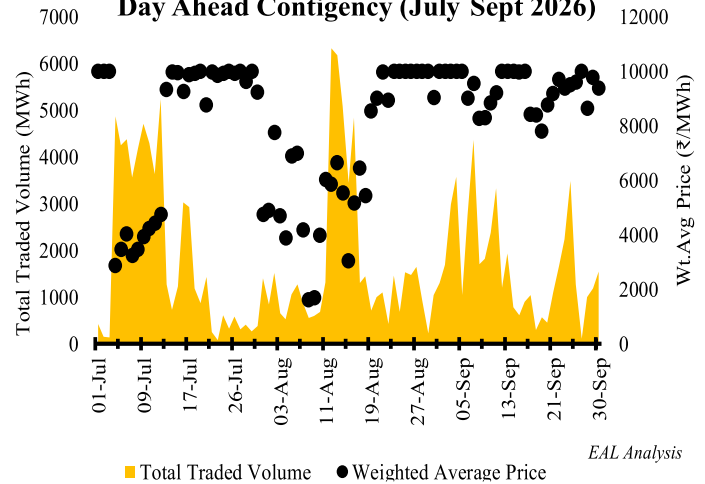
Term-Ahead Market

Day Ahead Contingency (July-Sept 2026)



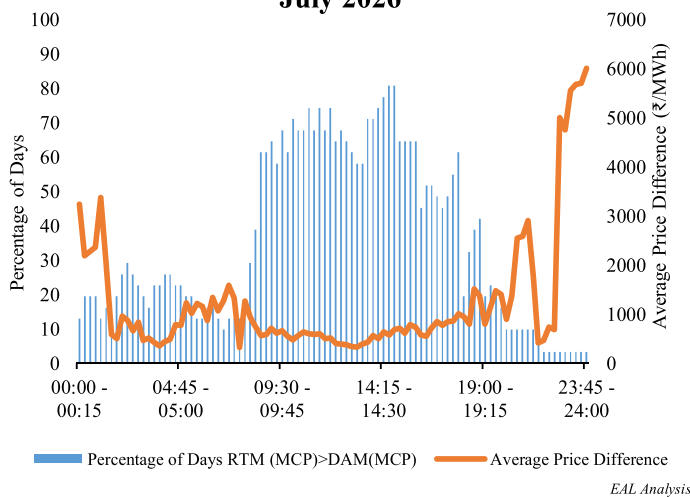
Green Term-Ahead Market

Day Ahead Contingency (July-Sept 2026)

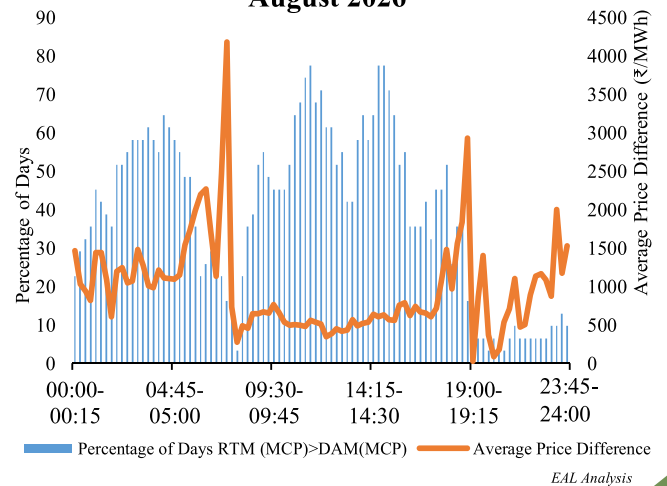


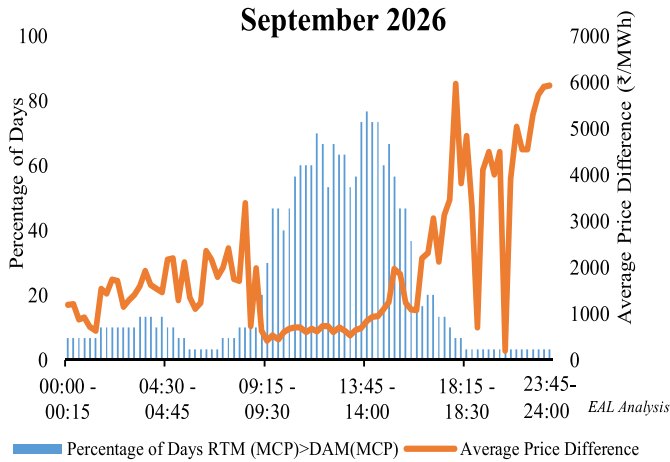
Price Difference between RTM & DAM

July 2026



August 2026

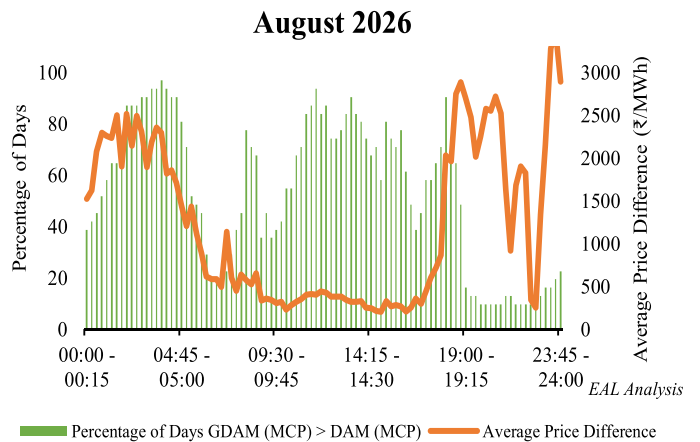
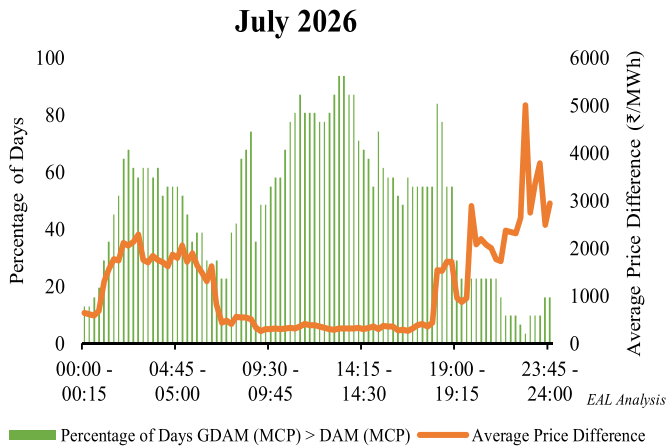




EAL Analysis

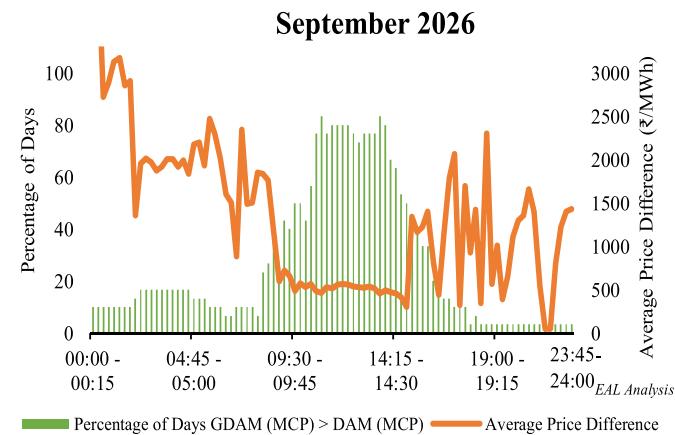
- The analysis is based on comparison between the average price difference of RTM and DAM, when MCP of RTM is greater than DAM for the second quarter of FY 2026-27.
- The graph shows the percentage of days, price for RTM is greater than DAM on the primary axis and the average price difference between the two on secondary axis.
- It has been observed that in 23:45-24:00 the highest average price difference is observed of Rs. 5.99/ kWh for the month of July, 2026.
- The average price difference between RTM and DAM is Rs. 1.37/ kWh for the quarter.

Price Difference between GDAM vs DAM



EAL Analysis

- The analysis is based on comparison between the average price difference of G-DAM and DAM, when MCP of RTM is greater than DAM for the second quarter of FY 2026-27.
- The graph shows the percentage of days, price for G-DAM is greater than DAM on the primary axis and the average price difference between the two on secondary axis.
- It has been observed that in 22:30-22:45 the highest average price difference is observed of Rs. 4.99/kWh for the month of July 2026.
- The average price difference between G-DAM and DAM is observed to be Rs. 1.24/ kWh for the quarter.



Opinion on UERC (Ancillary Services) Regulations, 2026 [Draft]



The Uttarakhand Electricity Regulatory Commission (UERC) issued draft “Ancillary Services Regulation, 2026”, issued on 4th June, 2026. The main objectives of the proposed regulations are:

Objective: The objective is to provide mechanisms for the procurement, deployment and payment of Ancillary Services at the State level, through both administered and market-based arrangements, so as to maintain grid frequency close to 50 Hz, restore it within the allowable band, and relieve congestion in the transmission network. The regulations apply to intra-State entities, including those with energy storage resources and those capable of providing demand response. They cover eligibility, deployment and payment for Secondary and Tertiary Reserve Ancillary Services, with settlement through the Deviation and Ancillary Service Pool Account.

EAL Opinion

✍ **Need for a unified and harmonized framework for ancillary services:** The Indian grid, which is governed by a single frequency, enables itself for a single and coordinated market for ancillary services (AS). The state-level AS regulations, if it is aimed to create separate intra-state mechanisms for addressing the intra-state AS for controlling the system frequency as per the area control error may lead to challenges for ensuring coordinated grid-balancing. The Indian grid, which is governed by a single frequency, enables itself for a single and coordinated market for ancillary services (AS). The state-level AS regulations, if it is aimed to create separate intra-state mechanisms for addressing the intra-state AS for controlling the system frequency as per the area control error may lead to challenges for ensuring coordinated grid-balancing.

Apart from market segmentation, which would reduce liquidity and hence efficiency of the AS market, segregation of the response of an intra-state entity with respect to different (in terms of quantum as well as direction) signals received from the NLDC/RLDC and the SLDC would also pose a significant accounting challenge.

It is proposed that the country aiming to achieve a safe, reliable and resilient power system should **have a Unified Grid Code that harmonizes all key aspects associated with the operation of the grid, roles and responsibilities, applicable timelines**, etc. This should also aim to achieve strictly time bound AGC implementation for all intra-state plants¹.

Alternatively, CER proposes that the **intra-state AS regulations aimed at maintaining grid frequency, may enable/ mandate participation of intra-state entities into the national/regional level SRAS mechanism and TRAS market/ mechanisms**. The state-level regulations should provide the **timeline for AGC implementation** across intra-state generators.

The state-level AS regulatory framework should enable the localised ancillary services, namely the primary reserve, voltage support and black start ancillary services.

✍ **Definition of intra-state entities:** *Clause 4 of the proposed draft states “These regulations shall be applicable to intra-state entities, including entities having energy storage resources and entities capable of providing demand response qualified to provide Ancillary Services and other entities as provided in these regulations” (emphasis added).*

It is suggested that the term “intra-state entities” in Clause 4 of the proposed draft may be defined and their applicability be clearly defined in the regulations. Such entities may include, the embedded generators (above a

Suggested Citation: Singh A. (ed.). (2026), Opinion on UERC (Ancillary Services) Regulations, 2026 [Draft], Power Chronicle (Vol. 09, Issue 02, pp.7-11), Energy Analytics Lab (EAL), Indian Institute of Technology Kanpur.

https://eal.iitk.ac.in/assets/docs/power_chronicle_vol_9_issue_2.pdf

¹Singh, Anoop (2026), Comments on draft National Electricity Policy, Regulatory Insights, Vol 8., No. 4, 2026

https://cer.iitk.ac.in/periodicals/regulatory_insights/Volume08_Issue04.pdf

min size) including the inter-state generators connected to the intra-state system, energy storage system (ESS) and the aggregators of demand response.

✍ **Eligibility of an AS provider:** In order to further clarify, Clause 7(1) of the proposed draft may be rephrased as “A generating station, an entity having energy storage resource **on a standalone or aggregated basis, or an entity capable of providing demand response on a standalone or aggregated basis**, and connected to the inter-State transmission system or the intra-State transmission system, shall be eligible to provide Secondary Reserve Ancillary Service (emphasis added)....” Similarly, the eligibility of TRAS provider in proposed Clause 14 may also be rephrased as “A generating station, an entity having energy storage resource **on a standalone or aggregated basis, or an entity capable of providing demand response on a standalone or aggregated basis**, and connected to the inter-State transmission system or the intra-State transmission system, shall be eligible to provide.... (emphasis added).”

✍ **Applicability of provisions adapted from CERC (AS) Regulations, 2022:** Several provisions of the proposed draft appear to have been derived from the CERC (Ancillary Services) Regulations, 2022. However, the draft regulations do not consistently distinguish between i) ancillary services procured and deployed by the SLDC for the State control area under the intra-state framework; and ii) participation of intra-state entities in the central ancillary services mechanisms governed by the CERC (AS) Regulations, 2022 and IEGC. Consequently, certain provisions appear either inapplicable to the intra-state SRAS/ TRAS or create ambiguity regarding the respective regulatory, operational and settlement responsibilities of the UERC, SLDC, RLDC, NLDC and RPC.

The following provisions of the proposed draft regulations require reconsideration and further clarification:

Inconsistency regarding the dispatch of SRAS at the regional and intra-state levels: 10(7) of the proposed draft provides that “SRAS shall be dispatched on **regional basis through secondary control signals**” (emphasis added). However, Clause 10(8) states that “Secondary control signals for SRAS-Up and SRAS-Down from **NLDC/SLDC** shall be sent to the control centre of the intra-state SRAS Provider every 4 seconds. The Intra-state SRAS Provider shall allow its control centre to follow the secondary control signal for SRAS-Up or SRAS Down automatically without any manual intervention” (emphasis added).

These provisions create ambiguity regarding the operational framework. While the draft primarily provides for procurement and deployment of ancillary services within the state control area, it also envisages dispatch signals from the NLDC. Further, Clause 8 expressly empowers the SLDC to activate SRAS based on the State Area Control Error (ACE). The regulations should therefore clearly distinguish between:

- i. State-level SRAS**, procured and deployed by the SLDC for managing the State Area Control Error; and
- ii. Regional/Inter-state SRAS**, provided by intra-state entities under the central SRAS framework operated by the NLDC in accordance with the CERC (Ancillary Services) Regulations, 2022 and the IEGC.

b. Inconsistency in the settlement mechanism: Clauses 11(2) and 11(3) provide that intra-state SRAS providers shall receive payments from, or make payments to, the respective Regional Deviation and Ancillary Services (DAS) Pool Account for SRAS-Up and SRAS-Down dispatch. However, this appears to be inconsistent with Clause 3(1)(l), which defines the Deviation and Ancillary Services Pool Account as the State Deviation and Ancillary Services Pool Account. This inconsistency appears to be a drafting error and requires clarification.

Accordingly, the draft regulations should clearly provide separate accounting and settlement mechanisms for:

- i. State-level SRAS:** SRAS procured and dispatched by the SLDC under the proposed regulations should be settled through the **State Deviation and Ancillary Services Pool Account** in accordance with the UERC regulatory framework.

ii. Regional/Inter-state SRAS: SRAS provided by intra-state entities pursuant to instructions issued by the NLDC/RLDC under the central ancillary services framework should be settled through the respective Regional Deviation and Ancillary Services Pool Account in accordance with the CERC regulations and approved operating procedures.

This distinction would ensure consistency between the operational and commercial arrangements under the state and central regulatory frameworks while avoiding jurisdiction overlap. Consequently, corresponding amendments may also be required in **Clause 21** of the proposed draft, which presently assigns several accounting and settlement responsibilities to the **NLDC, RPC, and the Regional DAS Pool Account**. Such responsibilities fall within the jurisdiction of the central regulatory framework and may be beyond the scope of regulations framed by the State Electricity Regulatory Commission².

It is reiterated that the state-level regulations may enable participation of intra-state entities in the central SRAS/ TRAS framework operated by NLDC and governed by the CERC regulations for maintaining the reference frequency across the grid. This would be a more appropriate design of AS market in the country. The intra-state AS regulation should thus focus on the localized ancillary services (primary reserve, reactive power and black start ancillary services).

c. Performance assessment and payment of incentives to intra-state SRAS providers: Clause 12 of the proposed draft provides that the performance of an intra-state SRAS provider and the corresponding incentive shall be computed by the **NLDC/RLDC** based on the actual response of the SRAS provider against signals issued by the **SLDC**. This provision appears ambiguous and raises jurisdictional concerns. The regulations should therefore clearly identify the nodal agency responsible for monitoring performance, evaluating compliance, calculating incentives, and administering the settlement mechanism.

Further, Clause 21 provides for settlement of performance-based incentives by the **RPC** through the **Regional DAS Pool Account**. However, the respective responsibilities for monitoring, data validation, performance assessment, computation of incentives, and settlement are not clearly delineated.

d. Ambiguity regarding the Detailed Procedure: Clause 3(1)(m) defines the “Detailed Procedure” as the detailed procedure issued by the **SLDC**. However, Clause 7(1)(a) states that “*has bi-directional communication system with SLDC as applicable, as per the requirements stipulated in the Detailed Procedure by the NLDC/RLDC/SLDC;*” (emphasis added). Furthermore, Clause 7(1)(d) states “*has metering and SCADA telemetry in place for monitoring and measurement of energy delivered under SRAS, as stipulated in the Detailed Procedure;*” (emphasis added) and does not identify the issuing authority. Further, Clauses 11 and 12 simultaneously refer to the **Detailed Procedure and the CERC (Ancillary Services) Regulations, 2022**. These provisions create uncertainty regarding the applicable procedural framework with which an intra-state SRAS provider is required to comply.

e. Several provisions of the draft appear to have been adopted from the **CERC (Ancillary Services) Regulations, 2022**, indicating that intra-state entities may participate in the central SRAS/TRAS framework. At the same time, the draft also provides for a separate intra-state ancillary service mechanism for frequency control without clearly defining the operational interface between the two frameworks.

⚡ Coordination between Central and State Ancillary Service Frameworks: The proposed draft permits SRAS and TRAS to be activated or dispatched by the **NLDC, RLDC, or SLDC**, as applicable. However, it does not establish a clear coordination framework, hierarchy, or priority criteria for dispatch instructions issued by different Load Despatch Centres (LDCs). This becomes particularly important where an intra-state ancillary service provider is eligible to participate simultaneously in both the **central ancillary services framework** administered by the **NLDC/RLDC** and the proposed **state-level ancillary services framework**, thereby overestimating the available reserves and creating the possibility of receiving simultaneous, overlapping, or conflicting dispatch instructions.

²Unless the intention of the regulation is only to enable participation of intra-state entities in the inter-state AS mechanisms

A similar ambiguity exists in the provisions relating to **TRAS**. Clauses governing procurement, scheduling, dispatch, price discovery, settlement, and payment refer to the **Day-Ahead Ancillary Service Market, Real-Time Ancillary Service Market, power exchanges, market-clearing prices, and the Regional Deviation and Ancillary Services Pool Account, all of which are integral components of the central ancillary services framework** under the IEGC and the CERC (Ancillary Services) Regulations, 2022. Simultaneously, the draft empowers the SLDC to communicate TRAS requirements, undertake procurement under the State Grid Code, participate in price discovery, and deploy TRAS. In its present form, the draft creates uncertainty as to whether it intends to facilitate participation of intra-state entities in the **existing central ancillary services market** or establish a **separate state-level ancillary services market**, without specifying the corresponding market design, institutional arrangements, bidding platform, or settlement architecture.

The draft regulations should further require the SLDC, in consultation with the UERC, NLDC, RLDC, and other stakeholders, to develop a comprehensive **Detailed Procedure** specifying, inter alia:

- coordination and priority criteria for dispatch instructions issued by different LDCs;
- the mechanism for identification and segregation of signals originating from the SLDC and the NLDC/RLDC;
- the attribution of the actual response of the Ancillary Service Provider to the respective State or regional instruction;
- the treatment of such response for scheduling, energy accounting and deviation settlement; and
- the methodology for performance assessment and incentive computation under the respective regulatory frameworks.
- The settlement timeline and periodicity.

It is therefore suggested that state-level regulations clearly specify that “the SLDC shall issue a separate Detailed Procedure for the implementation of intra-state SRAS.” The Detailed Procedure should, inter alia, prescribe the operational, communication, metering, monitoring, accounting, settlement, performance assessment, incentive computation, and other implementation requirements for state-level SRAS. Where participation of intra-state entities in the central SRAS framework is envisaged, the Detailed Procedure may be developed by the SLDC in consultation with the UERC, NLDC/RLDC, and other stakeholders to ensure consistency with the applicable state and central regulatory frameworks and to avoid any procedural ambiguity.

✍ **Suggested regulatory approach for TRAS:** The state-level ancillary services regulations may primarily enable and facilitate participation of eligible intra-state entities in the central Day Ahead and Real Time Ancillary Service Markets operated by NLDC (bids collected through power exchanges). For this purpose, the regulations may specify the functions of the SLDC in relation to:

- granting standing clearance and verifying technical eligibility/capability;
- ensuring non-overlapping capacity offers for AS;
- providing or validating telemetry, metering and operational data;
- incorporating the TRAS quantum cleared and despatched under the central framework into the State’s net schedule and the schedule of the concerned provider;
- monitoring the actual response of the intra-State provider; and
- facilitating data reconciliation and settlement under the applicable central regulations and procedures.
- Procurement, price discovery, selection, activation, despatch and settlement of market-based TRAS should be expressly governed by the CERC (Ancillary Services) Regulations, the IEGC and the applicable procedures issued by the NLDC. Despatch instructions for TRAS procured through the central market, including deployment in the event of shortfall or emergency, should originate from the NLDC and be communicated or coordinated through the concerned RLDC and SLDC.

✚ **Way Forward for the Intra-State Ancillary Services Framework:** Considering the operational complexity involved, it is recommended that any state-level ancillary service framework be implemented initially through pilot project undertaken by the SLDC in coordination with the NLDC and the concerned RLDC. The operational experience gained from the pilot may subsequently be used to finalize the Detailed Procedure and establish a robust framework for full-scale implementation.

Alternatively, if the objective of the draft regulations is only to facilitate the participation of intra-state entities in the existing **central SRAS/TRAS framework**, the regulations should expressly state this and avoid creating provisions that imply the establishment of a separate state-level ancillary services market. In such a case, the scope of the state regulations may be confined to enabling participation of intra-state entities and to localized ancillary services, such as **reactive power support, voltage control, black start capability, and other distribution-level flexibility services**, while the procurement and deployment of frequency control ancillary services continue under the central framework administered by the NLDC.

✚ **Incorrect cross-reference in Clause 9 (12):** Clause 9(12) of the proposed draft should read as follows: *“There shall not be any commitment charge for the SRAS providers for the capacity ascertained under clause (7) (10) or identified under clause (8) (11) of this Regulation, but not signalled for SRAS;” (emphasis added)*

✚ **Definition of Nodal Agency:** The term “Nodal Agency” used in Clause 12(5)(b), *“‘Actual Response’ is the actual energy output (in MWh) of the SRAS Provider communicated to the **Nodal Agency** aggregated over 5 minutes in absolute terms and then summed for a day” (emphasis added)*, may be defined in the proposed draft along with its roles and responsibilities related to registration, data collection, performance assessment, incentive computation and settlement. The incentive computation methodology may be aligned with the principles of the CERC (AS) Regulations, 2022.

Opinion on UERC (Deviation Settlement Mechanism and Related Matters) Regulations, 2026 [Draft]



The Uttarakhand Electricity Regulatory Commission (UERC) issued draft “Ancillary Services Regulation, 2026”, issued on 23rd August, 2026. The main objectives of the proposed regulations are:

Objective: The objective is to maintain grid discipline and grid security by providing a commercial mechanism for settlement of deviations between actual drawal or injection and the corresponding schedules. The regulations apply to all State grid connected entities and to intra-State purchase and sale of electricity. They specify the computation of deviation for sellers and buyers, frequency-linked charges with separate treatment for run-of-river, municipal solid waste, wind-solar and energy storage stations, and the operation of the Deviation and Ancillary Service Pool Account by the SLDC.

EAL Opinion

Applicability to Green Energy Open Access Consumers: The definition of “Open Access Customer” in the proposed sub-regulation (1) of Regulation (2) is as follows:

*“(v) ‘Open Access Customer’ means a consumer, trader, distribution licensee or a generating company who has been granted Open Access under the **Uttarakhand Electricity Regulatory Commission (Terms & Conditions of Intra-State Open Access) Regulations, 2015 and amendments** from time to time” (emphasis added).*

Further, ‘**Open Access Regulations**’ have been defined with reference to the UERC (Terms & Conditions of Intra-State Open Access) Regulations, 2015, and its amendments from time to time.

However, the draft norms omit any specific reference to Green Energy Open Access (GEOA), the UERC Green Energy Open Access Regulations, 2023, or GEOA consumers. This may lead to regulatory ambiguity and inconsistent treatment regarding the applicability of DSM provisions to GEOA consumers and may result in different interpretations during implementation.

It is therefore recommended that the draft Regulations **explicitly clarify the applicability of DSM provisions to GEOA consumers** and incorporate the appropriate reference to the UERC Green Energy Open Access Regulations, 2023.

Methodology for Calculation of Deviation for Renewable Energy Projects: The proposed DSM framework provides for the computation of deviation based on the difference between actual and scheduled injection/drawal. Under the proposed Regulation 6, deviation for general sellers and buyers is calculated as:

“(6) Computation of Deviation

(1) Deviation in a time block for General Sellers shall be computed as follows:

Deviation-General Seller (D-GS) (in MWh) = [(Actual injection in MWh) – (Scheduled generation in MWh)].

Deviation-General Seller (D-GS) (in %) = 100 x [(Actual injection in MWh) – (Scheduled generation in MWh)] / [(Scheduled generation in MWh)].

(2) Deviation in a time block for buyers shall be computed as follows:

Suggested Citation: Singh A. (ed.). (2026), Opinion on (Deviation Settlement Mechanism and Related Matters) Regulations, 2026 [Draft], Power Chronicle (Vol. 09, Issue 02, pp. 12-17), Energy Analytics Lab (EAL), Indian Institute of Technology Kanpur.
https://eal.iitk.ac.in/assets/docs/power_chronicle_vol_9_issue_2.pdf

Deviation-Buyer (D-BUY) (in MWh) = [(Actual drawal in MWh) – (Scheduled drawal in MWh)].

Deviation-Buyer (D-BUY) (in %) = 100 x [(Actual drawal in MWh) – (Scheduled drawal in MWh)] / [(Scheduled drawal in MWh)]”. (emphasis added)

The regulatory framework for the Deviation Settlement Mechanism (DSM), including the applicable incentives and penalties, is linked to the availability of capacity. In this regard, our comments on the “**CERC (Deviation Settlement Mechanism and Related Matters) Regulations, 2024 [Draft]**”³ provide insights into the methodology for calculation of deviation for WS sellers. Given that renewable energy will constitute a greater proportion of energy injection into the grid, particularly during months and hours when RE generation is higher, grid operation under such scenario will be challenging for the system operator or SLDC. Ensuring that the grid operates reliably, even with high RE penetration, is critical. The current approach of providing significant leeway to RE generators regarding their deviations-and penalty thereof is not sustainable and would jeopardize security of the grid in future. Therefore, an appropriate and clearly defined methodology for determining deviation for WS sellers is essential for maintaining grid security and reliability.

It is observed that the proposed draft has largely adopted the DSM framework laid down by the CERC. However, the provisions relating specifically to the computation of deviation for **WS sellers are missing, and the determination or use of the X-factor** is not considered. EAL’s prior submission⁴ may be referred to for details regarding the CERC-proposed methodology for determining the value of “X” (in %) for wind and solar deviation computation, and specific suggestions for the adopted approach.

The **X-factor approach** will ensure a seamless transition toward scheduling-based deviation calculation for WS sellers and penalty/incentive structure thereof.

It is therefore suggested that the provisions relating to deviation calculation for Wind and Solar sellers be incorporated into the state DSM Regulations, preferably in line with the X-factor-based methodology.

Further, it is suggested that the intra-state DSM framework should be appropriately harmonized with the prevailing inter-state DSM framework. **Having significantly different DSM frameworks at the state and inter-state levels may create scope for differences in treatment and potential arbitrage or gaming opportunities. Harmonization would provide greater regulatory clarity and support the secure and reliable operation of the grid with increasing RE penetration.**

✚ **Definition of Gaming:** In the proposed sub-regulation (1) of Regulation 2, ‘Gaming’ is defined as: “(o) ‘*Gaming*’ in relation to these Regulations, shall mean an intentional mis declaration of declared capacity by any seller or buyer in order to make an undue commercial gain through Charge for Deviations;”. (emphasis added)

✚ **Clarity in the Definition of Gaming:** The above definition refers to “intentional mis-declaration” of declared capacity. However, the draft Regulations do not clearly define what would constitute “intentional” mis-declaration or what level or extent of “mis-declaration” would be considered as gaming. It may be difficult to determine whether a particular deviation or mis-declaration was intentional or has occurred due to genuine operational or forecasting reasons. This ambiguity gives limited compliance confidence on part of the system operator, and may often be a subject of legal disputes. It is therefore suggested that the **definition of Gaming be further elaborated by clearly specifying what would constitute intentional mis-declaration, the criteria for determining mis-declaration, and the circumstances under which such an action would be treated as gaming.**

✚ **Applicability of the Definition to Sellers and Buyers:** In the proposed Regulation 9(3) states “(3) *The Commission, either suo-moto or on a Petition made by SLDC, or any affected party, may initiate proceedings*

³Singh A. (ed.). (2024), Opinion on CERC (Deviation Settlement Mechanism and Related Matters), 2024 [Draft], Power Chronicle (vol. 08, Issue 04, pp 7-24), Energy Analytics Lab, Indian Institute of Technology Kanpur. https://eal.iitk.ac.in/assets/docs/power_chronicle_vol_7_issue_1.pdf

⁴Singh A. (ed.). (2025), Opinion on CERC Discussion Paper on (Determination of value of “X” for Computation of the deviation (in %) for Wind and Solar (WS) Sellers from 01.04.2026 onwards under the provisions of the Central Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters) Regulations, 2024) Power Chronicle (Vol. 08, Issue 03, pp. 7-12), Energy Analytics Lab (EAL), Indian Institute of Technology Kanpur https://eal.iitk.ac.in/assets/docs/power_chronicle_vol_8_issue_3.pdf

against any State Constituent namely Generator, Distribution Licensee, Open Access Consumer etc. on allegations of gaming and if required, may order an inquiry in such manner as decided by the Commission. When the allegation of gaming is established in the above inquiry, the Commission may, without prejudice to any other action under the Act or Regulations there under, disallow any Charges for Deviation received by such State Constituent during the period of such gaming”.

The above provision allows proceedings for gaming against different state constituents, including the generators, Distribution Licensees, and Open Access Consumers. However, the proposed definition of gaming (Regulation 2 (1) (O)) refers to **“intentional mis-declaration of declared capacity by any seller or buyer.”**

Regulation 2 (20) of the CERC (Indian Electricity Grid Code) Regulations, 2023, states: *“‘Declared Capacity’ or ‘DC’ in relation to a generating station means, the capability to deliver ex-bus electricity in MW declared by such generating station to any time-block of the day as defined in the Grid Code, or whole of the day. Duly taking into account the availability of fuel or water, and subject to further qualification in these regulations;” (emphasis added)*

From a regulatory standpoint, the term “declared capacity” possesses a distinct statutory definition under prevailing grid codes⁵, where it refers specifically to the ex-bus generation capability declared by a generating entity. **Consequently, this metric does not apply in the same manner to buying entities, such as distribution licensees and open access consumers, whose primary regulatory obligation relates to scheduled drawal rather than capacity declaration.** The potential of gaming may arise in case of captive consumer(s) with their generation source being located within or outside the state.

Furthermore, a **“seller” is not inherently synonymous with a “generator”**, given that the electricity traders, power exchanges, or distribution licensees may also act as a seller.

It is therefore suggested that the definition of “Gaming” may be reviewed and suitably rephrased to clearly cover the different types of entities and actions that may constitute gaming. The terms used in the definition should also be aligned with the entities covered under Regulation 9 (3).

✍ **Inclusion of Manipulation and Misrepresentation in the Definition/Scope of Gaming:** As per the proposed Regulation 9 (4):

The above provision separately refers to “gaming, manipulation, misrepresentation or other practice.” However, ‘manipulation, misrepresentation or other practices’ are not part of Regulation 9(3) that provides for disallowance of deviation charges.

This leaves room for ambiguity during an investigation/legal proceeding, particularly where an action is found to involve manipulation or misrepresentation but does not fall within the existing definition of gaming. Alternatively, these aspects may be defined to be inclusive in the definition

of gaming. Furthermore, gaming may not just be related to provision of these regulations issued by the Commission. It is suggested that Regulation 9(4) may be rephrased as follows:

*“The Commission may, from time to time, conduct such study, investigation or inquiry as may be necessary to ascertain whether any **gaming through manipulation, misrepresentation or other practices** has been undertaken with a view to circumventing or defeating the provisions of these Regulations.” (emphasis added)*

✍ **Penalty Provision for Gaming, and Applicability for Payable Deviation Charges:** In the proposed clause 9(3): *“The Commission, either suo-moto or on a Petition made by SLDC, or any affected party, may initiate proceedings against any State Constituent namely Generator, Distribution Licensee, Open Access Consumer etc. on allegations of gaming and if required, may order an inquiry in such manner as decided by the Commission. When the allegation of gaming is established in the above inquiry, the Commission may, without prejudice to any other action under the Act or Regulations there under, **disallow any Charges for Deviation received** by such State Constituent during the period of such gaming”.* (emphasis added)

⁵CERC (Indian Electricity Grid Code) Regulation, 2023. https://cer.iitk.ac.in/Pdf_merge/merge/?id=9440

Gaming may not only influence deviation charges receivable but also those payable by the respective state constituents. Amendment to that effect should be introduced therein. In case of payable deviation charges during such periods of gaming, additional penalty provision should be specified. Gaming behaviour imposes systemic costs on the grid, such as frequency deviation and the deployment of ancillary services, while unfairly benefiting the entity or causing loss to the system constituents. **Such penalty may be linked to the overall financial impact of gaming for the affected parties with minimum level of penalty as a percentage of payable deviation charges. Such penalty should be applicable in case of receivable charges as well.**

The proposed provision states that, where an allegation of gaming is established, the Commission may “disallow any Charges for Deviation received” by the concerned State constituent during the period of such gaming.

However, the provision appears to address only situations where the state constituent is entitled to receive Charges for Deviation. It does not specify the treatment of the Charges for Deviation that may be payable by the state constituent during the period in which gaming is established. Therefore, the provision should be made more comprehensive by clearly specifying the treatment of both **Charges for Deviation receivable and payable** by the state constituent during the period of established gaming.

Injecting from Common/Single Metering Point: An issue arises when a generator holds both inter-state and intra-state contracts and injects electricity through a single meter. This challenge was previously highlighted in our inputs to HPERC⁶ and TNERC⁷.

Illustration: Let us assume a state-embedded generator has a total scheduled injection of 100 MW, comprising 50 MW under an inter-state contract and 50 MW under an intra-state contract. If the generator actually injects only 90 MW, there is a total deviation of 10 MW.

Particulars	Scheduled Injection	Actual Injection	Deviation
Inter-state	50 MW	40 MW	-10 MW
Intra-state	50 MW	50 MW	0 MW
Total	100 MW	90 MW	-10 MW

However, since both transactions are being met through a common meter, the actual injection of 90 MW could be attributed across multiple scenarios, including the following variations:

Scenario	Inter-state	Intra-state	Total Actual Injection
1	50 MW	40 MW	90MW
2	45 MW	45 MW	90 MW
3	40 MW	50 MW	90 MW

Depending on the applicable DSM rates and permissible deviation limits for inter-state and intra-state transactions, the generator may choose an allocation that minimizes deviation charges. This creates a potential loophole for gaming.

A similar issue arises for **open access and captive consumers** drawing electricity against schedules at both inter-state and intra-state levels **through a common meter**. In such cases, the consumer may similarly manipulate its actual drawal allocation between inter-state and intra-state transactions to minimize its DSM liability.

⁶ Singh A. (ed.). (2025), Opinion on HPERC (Deviation Settlement Mechanism and Related Matters) (Second Amendment) Regulation, 2025 [Draft], Power Chronicle (Vol. 08, Issue 01, pp 12-16), Energy Analytics Lab, Indian Institute of Technology Kanpur. https://eal.iitk.ac.in/assets/docs/power_chronicle_vol_8_issue_1.pdf

⁷ Singh A. (ed.). (2021), Opinion on TNERC (Grid Connectivity and Intra-State Open Access) (Amendment) Regulation, 2021 [Draft], Regulatory Insights (Vol. 04, Issue 03, pp 5-7), Centre for Energy Regulation, Indian Institute of Technology Kanpur. https://cer.iitk.ac.in/newsletters/regulatory_insights/Volume04_Issue03.pdf

Therefore, the Regulations should provide a clear methodology for the appropriation of deviation between inter-state and intra-state transactions where a common meter is utilized.

✶ **Gaming by OA Consumers Availing Supply Partly through Open Access:** An OA consumer utilizing both Discom supply and Open Access supply can potentially choose how much of its total consumption is attributed to each source. This creates an unmonitored variance in the treatment of deviation.

Illustration: Let us assume that an OA consumer has **10 MW of sanctioned demand from the Discom and 10 MW through Open Access**, resulting in a total expected consumption of 20 MW. However, its actual consumption may vary. The following matrix illustrates the potential allocation paths:

Total Consumption (MW)	Discom Supply (MW)	OA Drawal (MW)	Possible Treatment
20	10	10	Within the assumed arrangement
12	10	2	Higher share through Discom
8	8	0	Entire drawal through Discom
18	10	8	Higher share through OA
22	10	12	Excess drawal through OA
22	12	10	Excess drawal through Discom

For instance, when the total consumption is 22 MW, the consumer may choose to attribute 10 MW to the Discom and 12 MW to OA, or alternatively, 12 MW to the Discom and 10 MW to OA. Consequently, in cases of over-drawal, the consumer can deliberately manipulate the post-facto allocation of its drawal between OA and Discom supply to minimize the additional liabilities, whether through block-wise DSM charges or fixed/demand charges.

This variance in applicable charges may create a scope for the OA consumer to game its drawal allocation between OA and Discom supply, thereby minimizing its total financial liability.

DSM Charges	Demand / fixed charges
Block specific charges	Enhancement of demand leading to enhancement of fixed charges
Analysis indicates a risk when DSM charges are significantly lower than excess demand charges or standard demand charges The deviation charges applicable to a buyer in case of over-drawal are levied at the Normal Rate of Charges . The Normal Rate of Charges for a particular time-block is derived from the weighted average of the Area Clearing Prices (ACP) across different power market segments.	Charges for such excess load/ demand shall be levied at twice the normal rate of the applicable fixed/demand charge. For example: For industrial consumers billed on billable demand: Rate of Demand Charges = Rs. 480/kVA

It can be observed that the DSM charges for excess drawal may be significantly lower than the additional penal charges applicable for excess demand beyond the sanctioned limit.

It is therefore suggested that the DSM framework explicitly specify the treatment of deviation in cases where an OA consumer is supplied partly through Open Access and partly through the Discom. The framework should also provide suitable provisions to identify and address **repeated or deliberate switching of drawal between OA and Discom supply aimed at avoiding the applicable charges.**

Further, considering the increasing participation of large OA consumers, such entities may be required to **share day-ahead schedules for their expected drawal from Discom**, even if deviation charges are not initially imposed. This operational requirement would improve visibility regarding expected demand, thereby assisting the SLDC and Discom in system planning and scheduling.

✚ **Formation of an Inquiry Committee for Detection and Prevention of Gaming:** In the proposed Regulation 9(3) provides that the Commission may conduct an inquiry to examine allegations of gaming.

It is suggested that, instead of conducting the inquiry directly, the **Commission may constitute a dedicated committee to handle the investigation.** The committee should comprise appropriate technical and regulatory experts, as considered necessary by the Commission. Where required, technical experts from institutions such as **Grid-India (formerly POSOCO)** or other relevant organizations, may also be included.

Furthermore, the SLDC should be mandated to provide quarterly as well as annual report to the Commission on incidences of gaming identified, if any with relevant data thereof. Such report should be accessible in machine readable format at the SLDC and or the Commission's website. This would also discourage potential attempts for gaming and also make the SLDC accountable and vigilant in identifying such behaviour.

✚ **Publication of DSM Data:** The draft Regulations do not contain specific provision for placing block-wise, DSM-related data (including schedules, injection and applicable penalties) available in the public domain. Making such information accessible in the public domain would significantly improve **transparency and accountability** within the system.

It is suggested that the Commission may introduce a mandatory provision requiring the SLDC to publish **buyer-wise and seller-wise deviation accounts, deviation charges, and settlement details** on its website on a weekly basis. In addition, historical DSM data should be published to enable stakeholders and researchers to analyze deviation patterns and the overall performance of the DSM mechanism.

*“(8) **The intra-regional deviation** caused by way of over drawal or under drawal or over injection or under-injection shall be computed notionally @ Normal Rate of charges for deviation.” (emphasis added)*

The above proposed provision refers to the computation of **intra-regional deviation**. However, the concept of intra-regional deviation is not applicable in the context of **intra-state** or **state-level deviations**. Its applicability is limited to the CERC regulations. This may have made its way here inadvertently.



Power Lexicon

Draft UERC (Deviation Settlement Mechanism and Related Matters) Regulations, 2026

Area Clearing Price (ACP)	The clearing price is the price (in ₹/MWh) at which electricity is bought and sold through an auction in a market segment of a power exchange for a given 15-minute time block. When there is no congestion on the transmission corridors, the exchange matches the buy and sell bids submitted to the relevant market segment to discover a single Market Clearing Price (MCP), which applies to all bidding areas within that market segment. However, when transmission congestion occurs, clearing is carried out through a market splitting process, which may result in different prices for different bidding areas. The clearing price determined for a particular bidding area is called its Area Clearing Price (ACP). The ACP represents the electricity clearing price that a utility, generator or open-access consumer pays or receives for a cleared transaction in its respective bidding area during a specified time block. It excludes applicable charges and losses accounted for separately in settlement.
Integrated Day Ahead Market (I-DAM)	A physical electricity trading market on the power exchanges in which Day Ahead Contracts for delivery on the following day are transacted through collective transactions, integrating the following segments under a single framework - • Day Ahead Market (DAM), • Green Day Ahead Market (GDAM) and • High Price Day Ahead Market (HP-DAM) Market participants submit buy and sell bids for any or all of the 96 fifteen-minute time blocks of the next day, starting from midnight (00:00 hrs). Prices and quantum are discovered through a double-sided closed auction, with separate matching processes. Transmission congestion is managed through market splitting, with an Area Clearing Price (ACP) and Area Clearing Volume (ACV) determined for each area.
Deviation and Ancillary Service Pool Account	In context of the state DSM Regulation, It is an account which is maintained and operated by the SLDC. Charges for deviation from scheduled injection or drawal, along with the related late payment, are credited to this account. Also the payments to entities deviating in the grid-supporting direction and to ancillary service providers are made from it. The amounts received in the Deviation and Ancillary Service Pool Account will also be utilised by SLDC for payment of the consolidated bill(s) for the Deviation charges and the congestion charges raised by the NRLDC/ NRPC on Distribution Licensee/ SLDC for the State as a whole.
Gaming	In relation to the Deviation Settlement Mechanism (DSM), gaming means deliberately declaring capacity incorrectly, whether by a seller or a buyer, to gain an unfair commercial advantage from deviation charges. It includes manipulation, misrepresentation or any other practice meant to bypass or defeat the purpose of the DSM provisions.
Time Block	A period of specified duration, as determined by the CERC, for which energy meter readings of specified electrical parameters are recorded. The first Time Block of each day commences at 00:00 hours. At present, each Time Block has a duration of fifteen (15) minutes, resulting in 96 Time Blocks in a 24-hour day
Start-up power	Start-up power is the electrical power needed to operate the auxiliary equipment and systems used to start a generating unit. It may be required during initial commissioning or when restarting a unit after a shutdown. The equipment supplied and the amount of power required depend on the generating technology. In thermal units, start-up power operates equipment such as pumps, fans, fuel-handling systems and controls. In hydro units, it supports lubrication pumps, gate and valve operating mechanisms, excitation systems and controls. Start-up power may be supplied by the grid, another operating generating unit or an independent auxiliary source. It is distinct from start-up fuel, such as oil or gas used for ignition and warming up a thermal unit.



Knowledge Partnership at Bharat Renewable Energy Summit & Expo 2026



The **Centre for Energy Regulation (CER), IIT Kanpur**, is set to participate as a **Knowledge Partner** at the **Bharat Renewable Energy Summit & Expo 2026**, to be held from 2–5 November 2026 at **Bharat Mandapam, New Delhi**. CER will lead a session on **“Role of Market Instruments in Scaling Renewable Energy Adoption”**, focusing on the role of RECs, GDAM, GTAM, Green Energy Open Access, green tariffs, PPAs, and emerging carbon-market mechanisms in accelerating renewable energy deployment and market participation.

The session will feature an opening presentation by **Prof. Anoop Singh, CER, IIT Kanpur**, followed by a panel discussion moderated by him. The distinguished resource persons include Mr. P. Ravi Kumar (Chairman, Karnataka Electricity Regulatory Commission); Mr. Akash Tripathi, IAS (Managing Director, Solar Energy Corporation of India); Mr. Sumant Sinha, (Founder, Chairman and CEO, ReNew); Mr. Tony Bickerstaff, Chairman / Mr. Neil McDermott, Chief Executive, Low Carbon Contracts Company (LCCC); Mr. Jaimes Kolantharaj (Principal Energy Specialist, Asian Development Bank), Mr. Rohit Bajaj (Joint Managing Director, Energy, Indian Energy Exchange); Mr. Srinath Iyer (Head of Commercial, Clean Energy & Power (APAC), Google), along with representatives from DISCOMs of Telangana, Andhra Pradesh and Uttar Pradesh.

Through this engagement, CER aims to facilitate meaningful **dialogue among regulators, policymakers, industry leaders, and market participants** on effective market and regulatory frameworks for accelerating India's renewable energy transition.

Scan the QR code to access the link for more information.



Session on “Regulatory Reforms Using AI” at CEA Brainstorming Event “Making Indian Power Sector AI Enabled”



The **Centre for Energy Regulation (CER), IIT Kanpur**, will participate in the **CEA Brainstorming Event “Making Indian Power Sector AI Enabled”**, being organized by the Central Electricity Authority (CEA) on 14–15 October 2026 at **Manekshaw Centre, New Delhi**.

CER will lead **Session 2: “Regulatory Reforms Using AI”**, scheduled for 14th October 2026 from 12:00 PM to 1:30 PM. The session will begin with opening remarks by **Dr. Anoop Singh, Professor, IIT Kanpur**, followed by a context-setting presentation by KPMG and a moderated panel discussion on the role of AI in transforming regulatory processes.

The panel discussion will be moderated by Dr. Anoop Singh, IIT Kanpur, and will feature Dr. Jishnu Barua (Chairman, CERC), Shri P. Ravi Kumar (Chairman, KERC), Shri Rana Pratap Kalita (Chairman, AERC), Shri Ashish Kumar Goel (Chairman, UPPCL), Shri Kandarp Patel (MD & CEO, Adani Power) and Shri Regi Kumar Pillai (President, ISGF). The session will also include an audience interaction, followed by closing remarks by the panellists and moderator.

The session will explore how artificial intelligence can support regulatory reforms, improve decision-making, and enhance the efficiency and transparency of regulatory processes in the evolving Indian power sector. The broader event is being held under the theme **“Making Indian Power Sector AI Enabled”**, reflecting the sector's growing focus on AI-driven efficiency, innovation, resilience and sustainability.

Scan the QR code to access the link for more information.



Capacity Building Programme for LDCs “Regulatory and Policy Framework in the Indian Power Sector: Load Despatchers' Perspective”

The Centre for Energy Regulation (CER), IIT Kanpur, organized a **Capacity Building Programme for Load Despatch Centres (LDCs)** on “**Regulatory and Policy Framework in the Indian Power Sector: Load Despatchers' Perspective**” at the IIT Kanpur Outreach Centre, Noida. The programme was designed to strengthen the understanding of load despatchers and power-sector professionals regarding the evolving regulatory, operational, and market framework governing the Indian electricity sector.

The programme provided participants with comprehensive insights into the economic fundamentals of the power sector, the Electricity Act, GNA and Connectivity, transmission pricing and POC charges, capacity markets, resource adequacy, IEGC, power system operation, and DSM. It also covered emerging areas such as PXs operations, collective transactions, intra-state ancillary services, Automatic Generation Control (AGC), power-sector modelling and resource adequacy planning.

The programme brought together distinguished experts from power sector. The sessions featured eminent speakers including Dr. Anoop Singh (Professor, IIT Kanpur), Ms. Shilpa Agarwal (Joint Chief (Engineering), CERC), Dr. Sushant K. Chatterjee (Chief (Regulatory Affairs), CERC), Mr. Ghanshyam Prasad (Chairperson, CEA), Mr. Aman Gautam (Chief Manager, GRID-India), Mr. S. K. Soonee (Former Advisor, POSOCO), Mr. Chandan Sinha (Assistant Vice President, IEX), Mr. Shashank Jewalikar (Executive Director, MSLDC), Mr. Prabin Panday (PPGCL), Mr. Lalit Singh (Deputy Chief Engineer, PPGCL), Mr. Venkateshan M. (General Manager, GRID-India).

The programme concluded with a **valedictory session**, with **Mr. Samir Chandra Saxena, CMD, Grid-India**, as the chief guest. The programme served as a platform for knowledge exchange and capacity building, enabling participants to better understand the regulatory and operational dimensions of the rapidly evolving Indian power sector from a load despatchers' perspective.



Masterclass on “Electricity Derivatives: Power Procurement, Market Operation & Risk Management”

The Centre for Energy Regulation (CER), IIT Kanpur, is organising a three-day residential masterclass from **7th-9th December 2026** at the **IITK Outreach Centre, Noida**. Designed for power sector stakeholders, the programme will focus on identifying risk exposure, exploring risk management avenues, and developing portfolio strategies for participation in electricity derivatives market.

Scan the QR code or visit the link for more information.



<https://cer.iitk.ac.in/ole/>

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