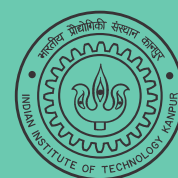




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Editorial

The electricity sector awaits the next phase of reforms as it steers a power system with rising RE share, while DISCOMs continue to face financial challenges with impending retail supply competition. The draft National Electricity Policy (NEP) can be an instrument to introduce reforms that do not require amendment to the Electricity Act, 2003.

The next phase of reforms should be anchored in strengthening the regulatory governance framework. Regulatory commissions in India remain significantly understaffed relative to international standards, reflecting a gap in institutional capacity. Adequate staffing of load despatch centres across states and continuous skill upgradation, aligned with the evolving market and regulatory landscape, require urgent attention.

Regulation and deregulation are not mirror images. Deregulation should emerge from expanding competition with regulatory oversight. The regulatory burden may be reduced through an autonomous regulatory process with oversight, enabling transition to performance-based regulation. Regulatory Impact Assessment (RIA) should be mandated so that stakeholder impact, particularly on consumers, guides regulatory directions and tariff determination. Greater consumer participation must be ensured through an appropriate institutional framework, supported where necessary by consumer contributions.

Retail supply competition would offer consumer choice but requires stronger regulatory oversight for protection. Premature exemption of large consumers from DISCOM service obligations would enable exit and further weaken DISCOM finances. A phased and regulated transition, aimed at efficiency in operations and procurement, should guide its introduction. Carriage and content separation remains preferable to multiple distribution licensees, which risk overinvestment in parallel natural monopoly assets and increased disputes.

The NEP should mandate AGC implementation over 2-3 years and a Unified National Grid Code as essential to a secure and resilient grid with increasing RE share. Strengthened load dispatchers and emerging distribution system operators can address evolving grid challenges while enabling products such as demand response and peer-to-peer trading—the former being an immediate requirement, the latter contingent on relative economics.

India’s electricity transition must be guided not only by clean energy targets but also by sound economics, regulatory governance, and consumer protection. While the NEP 2026 has the right intent, some provisions must align with the ethos of the Electricity Act, 2003 to avoid reinforcing inefficiencies. Policy vision must be supported by institutional mechanisms to deliver reliable and affordable power.

A synchronised grid with a common market should include a Unified Ancillary Services market with localised products. A capacity market for short- to medium-term firm capacity can help rebalance portfolios under resource adequacy requirements and address legacy PPA burdens for DISCOMs. The regulatory framework should also enable products such as contracts for difference and derivatives.

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Keywords: Cross-subsidy, Distribution Network Operation, Distribution System Operation, Energy Efficiency, Green Finance, Grid Interactive Distributed Renewable Energy, India Energy Stack, Market Monitoring Framework, Performance-Based Regulation, Power & Fuel Expenses, Regulatory Impact Assessment, Retail Supply Competition, Stabilisation Fund, Time of Day, Unified Ancillary Services market, Unified National Grid Code, Universal Service Obligation, Capacity Market.

Opinion on MoP Draft National Electricity Policy, 2026 Cite

The MoP notified the draft titled “National Electricity Policy, 2026”, issued on 20th January, 2026. The key objectives of the document are mentioned below:

Objective: The Draft National Electricity Policy (NEP), 2026 aims to provide a comprehensive roadmap for developing a reliable, affordable, financially viable, and environmentally sustainable power sector aligned with India's vision of *Viksit Bharat @ 2047*. The policy seeks to ensure adequate and reliable 24×7 power supply while meeting future demand growth, alongside achieving the financial turnaround of the power sector, particularly distribution utilities. It emphasizes the promotion of competitive electricity markets to reduce costs and enhance efficiency, while also increasing the share of non-fossil energy to support energy transition goals. Further, the policy focuses on strengthening grid resilience, flexibility, and cybersecurity to enable high levels of Renewable Energy (RE) integration. It also aims to enhance consumer-centric services, including improved quality of supply, and effective grievance redressal mechanisms. In addition, the NEP seeks to improve industrial competitiveness through cost-reflective tariffs and the progressive reduction of cross-subsidies, while enabling energy efficiency, demand-side management, and the electrification of end-use sectors.

CER Opinion

CER Competition and Efficiency in the Vision Statement: The vision statement of the National Electricity Policy should reflect all core principles guiding the development of the power sector. The draft NEP, 2026 vision currently states: *“Providing reliable 24×7 quality power through a financially viable and environmentally sustainable power sector furthering energy security at an affordable price.”*

While the vision appropriately highlights reliability, financial viability, environmental sustainability, energy security, and affordability, it does not explicitly include **efficiency**, which is a fundamental principle of electricity sector planning and operation. Efficiency plays a critical role in optimal utilization of generation resources, reduction of system costs, improvement of utility performance, and enhancement of long-term sustainability of the sector. The preamble of the Electricity Act, 2003 also emphasizes on efficiency as well as competition, both of which should be incorporated in the vision statement.

The present wording seems to bestow responsibility of financial viability on the sector constituents including the consumers. The responsibility of viability in essence would be borne by consumers who would have to pay for inefficiency of the generation, transmission and/or distribution entities. While the viability of the sector is crucial from the perspective of attracting new investment in the sector, the viability of tariffs for efficiently benchmarked operational and financial efficiency would be a desirable outcome.

It is therefore suggested that efficiency and competition may also be explicitly incorporated in the vision statement as suggested below. *“Providing reliable 24×7 quality power through an efficient, competitive, financially viable and environmentally sustainable power sector furthering energy security at an affordable price.”*

CER Alignment of Non-Fossil Capacity Targets with NDC Commitments: The draft National Electricity Policy, 2026 outlines the following objective: *“**Increase** the share of non-fossil capacity to achieve the Nationally Determined Contribution (NDC) targets.”*

The NDC commitments with respect to share of RE capacity has already been met before the 2030 deadline. The current level of Renewable consumption Obligation (RCO)/Renewable Purchase Obligation (RPO) has already contributed towards that goal. Further increase, with 2030 in sight, may not be desirable as the RCO/RPO targets are aligned to the NDC target. While the long-term objective of increase in renewable capacity is desirable and well

intentioned, as the policy rightly recognizes the need for an increasing share of non-fossil energy in the electricity mix, the current formulation appears to presume or pre-empt the trajectory of future NDCs i.e. beyond 2030. Given that NDC commitments are determined at the national level and may evolve over time in line with international negotiations and domestic policy considerations, the formulation of the objective may instead emphasize alignment with NDC targets, which may be set higher for the period beyond 2030. It is therefore suggested that the objective may be revised as follows: “*Align the share of non-fossil capacity to achieve the Nationally Determined Contribution (NDC) targets.*”

Such a formulation would ensure that the policy framework remains consistent with evolving NDC commitments while retaining flexibility in planning the future generation mix.

CER Competition in Procurement and Supply of Electricity: The Draft NEP, 2026 currently states the objective as: “*Promote competition in supply of electricity.*”

While promoting competition in supply is an important policy direction, competition in the power sector operates not only at the level of retail supply but also in power procurement and market-based procurement mechanisms. Electricity markets, power exchanges, and competitive procurement processes play a critical role in ensuring transparent price discovery, and thus efficient resource allocation.

Accordingly, the objective should reflect competition across the supply chain including procurement of electricity. It is therefore suggested that the objective may be revised as follows: “*Promote competition in **procurement** and supply of electricity.*”

CER Numerical Target for Per Capita Electricity Consumption: The Draft NEP, 2026 currently states: “*Increase per capita electricity consumption to 2,000 kWh by 2030 and over 4,000 kWh by 2047, ensuring energy efficiency and responsible usage.*”

This translates to a targeted growth in per capita electricity consumption represents a CAGR of about 5.92 % (7.5%) per annum for the 2030 target, and about 4.43% (4.16%) per annum from then to 2047².

While improvement in energy efficiency is expected to lower the growth of electricity consumption, growing electrification of mobility and cooking, and rising cooling demand would push it upwards in future. Thus, one may not expect significant decline in growth in per capita electricity consumption unless there are significant breakthrough in efficiency of utilisation of electricity.

Target for 2047 may thus be revised upwards. An alternate target may be to reach world's average per capita electricity consumption.

CER Demand-Side Interventions: The Draft NEP, 2026 currently states: “*Enhance consumer centric service and implement demand side interventions.*”

While consumer-centric services and demand-side measures are important elements of modern power system management, the present formulation remains broad and may be interpreted in multiple ways. Demand-side interventions, such as demand response, time-of use tariffs, and load management, are increasingly being adopted to improve power system flexibility, facilitate integration of RE, and enhance overall system efficiency.

In this context, it may be appropriate for the objective to explicitly reflect the role of demand side interventions in enhancing system flexibility. Accordingly, it is suggested that the objective may be revised as follows: “*Enhance consumer centric service and implement demand side interventions to **enhance power system flexibility.***”

CER Next Phase of Regulatory Reforms and Philosophy of Regulation: The evolution of the regulatory philosophy from pure cost of service (CoS) to the normative cost of service (NCoS) has ensured that incentives for efficiency are incorporated in the regulatory approach for tariff setting through operational and financial benchmarks. While normative approach has reduced regulatory burden to some extent, the process still demands extended regulatory process, in most cases overburdening the regulatory commissions, who are short of human resources and become

²Consumption is recorded for a duration of time (say, a year). The targets seem to specified with respect to the calendar year, while recorded data on per capital electricity consumption is generally reported for the financial year. The twin estimated of CAGR correspond to alignment of the consumption with respect to a 'nearest' matching financial year. The targets may alternatively be specified in terms of financial year.

increasingly dependent on external resources, jeopardizing institutional memory and learning in the process.

The next phase of regulatory approach should adopt a two-prong strategy –

- (i) 'Autonomous' regulatory processes with regulatory oversight
- (ii) Transition towards Performance Based Regulation (PBR) with efficiency benchmarks

These may be adopted in order. The 'autonomous' approach, which may be initially adopted for generation and transmission, entails development of data-based processes with verified and approved worksheets³ for 'self calculation of tariff for each year of control period. The tariff so calculated would be 'deemed to have regulatory approval and subject to true-up by the commission'. At the end of the control period, a true-up order issued by the regulatory commission would cross check the tariffs calculated and impose penalty in case of over-recovery underrecovery or allow for recovery of cost in case of under-recovery beyond a tight tolerance band of say 2-3%.

Implementation of this process must involve transparency whereby the tariff sheets are developed through a consultative process and are made available in advance on the commission's website. Following the regulatory timelines, a generator or a transmission licensee would calculate the tariff by inputting the required data. The worksheets with final calculations and tariff so arrived would be submitted to the respective commission, who would put it on its website as well the regulated entity's website for a limited duration of, say 1 month, for the regulated entity to take note of the inputs provided by the stakeholders including the commission itself. This transparent process would ensure that there is necessary buy-in from the stakeholders particularly the distribution licensees and the end consumers.

The approach to PBR avoids detailed cost scrutiny for tariff determination and is rather based on performance benchmarks that drive efficient operation while allowing for recovery of cost with adjustment for efficiency improvement, and general/specific level of rise in cost heads. A preliminary approach incorporating some of these features in the cost of service regulation was suggested by the CER^{4 5} and was adopted in a limited way.

CER Strengthening Regulatory Governance Framework: Regulatory reforms in the sector have played a key role in bringing about changes in the sector, among others, to attract private investment, adopt sustainable technologies, adopt transparent and consultative process, set performance targets and incentivise efficiency improvement. A study conducted by the CER for NITI Aayog identified numerous areas for strengthening regulatory governance framework in the Indian power sector. Enhancement of regulatory governance framework, among others, should focus on the following

- (i) Enhancement in approved number of employees⁶, particularly for the regulatory processes, and salary and benefits thereof⁷;
- (ii) Focused and sustained capacity building
- (iii) Greater consumer participation in regulatory processes

³Some of the regulatory institutions, including Ofgem, make available the detailed tariff worksheets in public domain through its web portal. For example, <https://www.ofgem.gov.uk/energy-regulation/domestic-and-non-domestic/energypricing-rules/energy-price-cap/energy-price-cap-default-tariff-levels>

⁴Singh, Anoop (2021), Comments on JSERC (Terms and Conditions for Determination of Distribution Tariff) Regulations, 2020, Centre for Energy Regulation, IIT Kanpur. Available at https://cer.iitk.ac.in/newsletters/regulatory_insights/Volume03_Issue02.pdf

⁵Deliberations of Regulatory Manthan on the topic can be accessed at <https://cer.iitk.ac.in/RM/rm1>

⁶The regulatory institutions across the world are well staffed to undertake regulatory functions in a timely manner.

Analysis by CER finds that number of employees at some of the key regulatory institutions including Australia Energy Regulator (AER), Federal Electricity Regulatory Commission (FERC) and Ofgem (UK) is estimated to be 1-2000 even though their regulatory functions are limited on account of competition in generation and retail supply business. While some of these regulators also regulate other sectors especially gas, the predominant employee share is on account of the electricity sector regulation. In comparison, number of regulatory employees at electricity regulatory commissions in India range from 10-100.

⁷Salary structure at regulatory institutions should be higher than the industry level (regulated entities), helping to place them at the higher pedestal of independence and integrity.

(iv) Enhance accountability through timely submission of annual report and annual accounts, and enhancement of scope thereof⁸

(v) Greater independence of financial as well as administrative nature

The Indian power sector faces significant regulatory challenges and is expected to address even larger set of challenges with an evolving power sector. Under-staffed institutions of such importance are strained to achieve their regulatory objectives, placing greater dependence on external service providers resulting in significant loss of institutional memory and sustenance of weak institutional capacity. Forum of Regulators (FoR), may work towards **Human Resource Adequacy Guidelines** for the ERCs, suggesting minimum staffing requirement based on current experience and international best practices. The Electricity Council, proposed in the Electricity Amendment Bill 2025, can play an important role in enabling institutional strengthening of ERCs by providing inputs of the respective governments, who sanction the number of posts for the ERCs.

CER Institutional Strengthening of Load Despatch Centres (LDCs): LDCs play a crucial role in ensuring a robust power system operation for secure and reliable system operation. Their role becomes even more important with uncertainties associated with VRE, which are expected to play even greater role in the future. Apart from ongoing engagements with respect to market operation, ancillary services, greater challenges emerge as they play an important role in planning to ensure resource adequacy, and future introduction of the capacity market.

The recommendations of Capacity Building of Indian Load Dispatchers' (CABIL), which was endorsed by the FoR in 2018, should be updated in the current context and placed for adoption across states. **Adequate human capacity, and continuous capacity building efforts are required to ensure that the LDCs are future ready.** Functional and financial autonomy is also vital to the independence of the load dispatch centres which are expected to play an impartial role especially in a sector with increasing role of open access and retail supply competition. **Organisational separation and corporatisation of LDCs should be the medium-term goal for the LDCs.** The NEP should highlight the need for institutional strengthening of LDCs.

CER Regulatory Impact Assessment (RIA): The key regulations affecting tariff for generation, transmission and distribution should be tested against the potential impact for key stakeholders. The existing regulatory approach does not provide an assessment of available alternate options for tariff regulation including key regulated parameters on stakeholders, both the regulated entities and the buyers (distribution licensees and the end consumers). The NEP should suggest a regulatory role for conducting RIA to be undertaken by the Regulatory Commissions, before the adoption of tariff regulations for the upcoming control period and changes thereof thereof, safeguarding the interests of all stakeholders, particularly end consumers. **The international best practices demonstrate the transparent approach adopted by the regulatory institutions thereby ensuring necessary buy-in from stakeholder and also reducing potential for disputes later.**

CER Data Governance: Strengthening Data Availability and Accessibility: Reliable and transparent decision-making in the power sector increasingly depends on the availability of high-quality data and the ability of institutions to access and analyse such information in a timely manner. Data availability and accessibility of sufficient and timely data for better decision making and strengthening research based on data in the Indian context. Appropriate frameworks should therefore be developed to facilitate standardized data collection, sharing, and dissemination across sectoral entities while ensuring data integrity, transparency, and usability for policy formulation, regulatory oversight, and academic research.

CER A sector level data governance guidelines for ease of data access with necessary safeguards should be put in place ensuring that the Indian researchers do not end up working with data of other countries (with limited relevance in the Indian context), thus avoiding another kind of brain drain for the country.

Resource Adequacy: The provision relating to resource adequacy may benefit from explicitly recognizing the importance of cost-effectiveness in addition to reliability. The Draft NEP, 2026 currently states: *“A structured mechanism for resource adequacy must be established at national, state, and distribution utility levels to ensure reliable 24×7 power supply.”*

⁸ CER deliberated on these issues in detail at its Regulatory Conclave on "Regulatory Governance in the Indian Power Sector: Reporting and Accounting Framework for ERCs" in July 2024. For further details, see <https://cer.iitk.ac.in/RegulatoryConclave/RC3>

While ensuring reliability of supply is a primary objective of resource adequacy planning, **it is equally important that such planning ensures cost-effective procurement and utilization of resources.** Resource adequacy frameworks are intended not only to maintain reliability but also to optimize resource mix and minimize the overall cost of supplying electricity to consumers (as enshrined in the Electricity Act, 2003). Accordingly, it may be appropriate to explicitly incorporate the principle of cost-effectiveness in the formulation. **Inadequate consideration of cost impact may result in financial burden on DISCOMs and impact the consumer tariffs.**

It is therefore suggested that the provision may be revised as follows: *“A structured mechanism for resource adequacy must be established at national, state, and distribution utility levels to ensure reliable and **cost-effective** 24×7 power supply.”*

This revision reflects the dual objective of ensuring reliability while maintaining economic efficiency in power system planning and operations.

CER FPPCA-Based Recovery of Power Purchase Cost: The provision relating to cost recovery emphasizes the importance of ensuring that tariffs reflect the actual cost of supply in order to maintain financial sustainability of the power sector. The Draft NEP, 2026 currently provides that: **“Power purchase cost increases must be automatically passed through to consumers on a monthly basis.”**

While the intent of enabling timely pass-through of power purchase cost variations is appropriate, the **NEP should also mandate annual assessment of reasons behind increase in tariff which should be analysed, updated and tracked by the ERCs.**

The mechanism of Fuel and Power Purchase Cost Adjustment (FPPCA) or Fuel and Power Purchase Adjustment Surcharge (FPPAS) framework introduced by most of the SERCs/JERCs in the respective state/UTs provides for automatic passthrough of increase in power purchase cost **with certain limitations. The draft NEP should recognize the limitation on such pass through. The clause may be modified as, “Change in Power purchase cost must be automatically passed through under the mechanisms approved by the appropriate commission.”**

CER Stabilisation Fund: The provision relating to cost recovery also proposes the creation of stabilization funds to manage power purchase cost fluctuations. While the intent of managing tariff volatility is understandable, the proposed mechanism may be relied upon more often than increase in tariff or improvement in efficiency. **While this may temporary fill the vacuum left due to the court mandated ban on creation of new regulatory asset, any reasonable amount of stabilization fund would soon be exhausted across the states with high burden of regulatory assets.**

In the absence of clear institutional design, funding mechanism and operational framework, the proposed stabilisation fund mechanism may introduce ambiguity in tariff determination process and would shield operational and financial inefficiency of utilities.

Accordingly, the provision relating to stabilization funds may either be reconsidered or be accompanied by clear policy guidance regarding its design, governance, and operational framework.

CER Amendments to Tariff Policy: The National Electricity Policy is intended to outline the **overall strategic vision and direction for the development of the power sector.** Apart from highlighting the importance of timely issuance of tariff orders, timelines for regulatory proceedings, and separation of distribution and supply tariffs, these should be reflected in the tariff policy through an amendment. Apart from this, a number of other provisions of NEP, for example pass through of fuel and power purchase cost, also point towards amendments in the tariff policy. Post NEP 2026, such amendments should be reflected in the tariff policy as well.

CER Accountability for AT&C Loss Reduction: The provision on loss reduction may require alignment of responsibility with the entity that is directly accountable for operational performance.

The Draft NEP, 2026 currently provides that: *“...**State Governments** must target single-digit AT&C losses, with commercial loss reduction and timely payments of Government and local body dues.” (emphasis added)*

While State Governments have an important role in enabling sectoral reforms and ensuring timely payment of dues, AT&C loss reduction is fundamentally an operational responsibility of the Distribution Licensees, some of whom are

private licensees as well. **Accordingly, the obligation may be more appropriately placed on the entity directly responsible for network management, billing, collection, and loss control i.e. the distribution licensees.** It is suggested that the provision may be revised as follows:

“...**Distribution Licensees** must target single-digit AT&C losses, with commercial loss reduction and timely payments of Government and local body dues.”

CER Storage Obligation on for Agri PV: The provision relating to solarisation of agriculture feeders with storage may require reconsideration from the perspective of operational responsibility and cost recovery. The Draft NEP, 2026 provides that: “By 2030, **States shall complete the solarisation of all agriculture feeders, suitably backed by storage, to enable reliable power supply to farmers, alongside the solarisation of individual agriculture pumps and deployment of stand-alone solar pumps wherever required, thereby contributing to a reduction in the subsidy burden on State Governments.**” (emphasis added)

Solarisation of agricultural feeders/ agricultural pumps not only enables greater adoption of renewables, it is also instrumental in reducing subsidy burden for DISCOMs. The proposed clause seems to place obligation of energy storage system for agricultural feeders as well as individual agri-PV pumps on the respective state governments. This, in turn, would be undertaken by the distribution licensees placing significant cost burden leading to higher overall tariffs. **The overall economics of storage investment for agricultural feeders does not seem to be justified as the original objective of solarization of agricultural feeders/ agricultural pumps was to utilize solar energy during the day.** It is more economical to ensure the desired reliability through grid connected solar PV, if required, (rather than through feeders or individual for pumps) with the available portfolio of power supply sources including storage.

CER Return on Investment and Incentive Framework: The provision relating to attracting private investment highlights the need for predictable returns and stable regulatory frameworks in order to mobilize capital for the power sector. The Draft NEP, 2026 provides that return on investment must be competitive with other sectors and that regulatory frameworks should include performance-based incentives.

While ensuring attractive returns is important for attracting private capital, the regulatory framework must also ensure that returns remain **fair and competitive**, while encouraging operational efficiency and accountability. Study undertaken at the CER estimated return on equity for a number of infrastructure sub-sectors including power sector. It was found⁹ that the estimated cost of equity for transmission investment is significantly lower in comparison to the regulated return on equity. Accordingly, it is suggested that the provision may be revised as follows: “*The return on investment must be fair and competitive, and performance-based incentives & disincentives.*”

The regulatory design for incentives should be applicable in case of performance beyond the mandated benchmark ensuring that the investment frameworks remain attractive while also incorporating **appropriate incentives and disincentives linked to performance**, thereby strengthening accountability and efficiency in operations.

CER Role of Competition in the Power Sector: The provision on building a competitive market appropriately recognizes the importance of promoting competition in the power sector. The Draft NEP, 2026 currently provides that: “*Competition across the power sector must be promoted to benefit consumers.*”

While the emphasis on consumer benefit is appropriate, the objective of promoting competition extends beyond consumer welfare and also contributes to broader sectoral outcomes. It is suggested that the provision may be elaborated as follows: “*Competition across the power sector must be promoted to benefit (a) end consumers, (b) cost competitiveness, and (c) to promote investment and efficiency.*”

CER Development of Short- to Medium-term Capacity Market: At the same time, the effectiveness of competitive electricity markets depends on the presence of **appropriately calibrated resource adequacy mechanisms** to ensure

⁹Results indicate that regulated (post-tax) returns (~14% base + grossing up for tax) exceed the estimated post-tax cost of equity (11% - 12.5% for conventional generation and 10-11% for transmission) calculated using CAPM and multifactor models. Kewal Singh, Anoop Singh, Puneet Prakash, 2022, "Estimating the cost of equity for the regulated energy and infrastructure sectors in India" Utilities Policy, <http://dx.doi.org/10.1016/j.jup.2021.101327>

Singh, A., Comments on CERC's (Terms & Conditions for tariff) Regulations, 2024 [Draft] Regulatory Insights, Volume 6, Issue 4, Centre for Energy Regulation (CER), IIT Kanpur. https://cer.iitk.ac.in/newsletters/regulatory_insights/Volume06_Issue04.pdf

Singh, A., Opinion on UERC (Terms and Conditions for Determination of Multi Year Tariff) Regulations, 2024 [Draft] Regulatory Insights, Volume 6, Issue 4, Centre for Energy Regulation (CER), IIT Kanpur. https://cer.iitk.ac.in/periodicals/regulatory_insights/Volume07_Issue02.pdf

long-term reliability of supply. Competitive energy markets alone may not always provide adequate signals for investment in firm capacity, particularly in systems with increasing penetration of variable RE and evolving demand patterns. In this context, there is a need to explore the development of **capacity markets**, which can provide clear and predictable investment signals for capacity addition, ensure availability of adequate generation resources during peak demand conditions, and support long-term system reliability while maintaining competitive market outcomes.

This clarification highlights the broader role of competition in improving cost efficiency, encouraging investments, and strengthening overall sector performance.

CER **Exemption from Universal Service Obligation for Large Consumers:** *“Regulatory Commissions... may exempt the distribution licensees from the Universal Service Obligation in respect of consumers having a contracted load of 1 MW and above, capable of self-procurement.”*

“State Commissions should exempt manufacturing enterprises, Railways, and Metro Railways from payment of cross-subsidies and surcharges.”

The Draft NEP, 2026 proposes that distribution licensees may be exempted from the Universal Service Obligation for consumers having a contracted load of 1 MW and above, who are capable of self-procurement of electricity through open access. While this proposal aims to enhance market competition and improve cost competitiveness of industrial consumers, its implications for the financial viability of distribution licensees require careful consideration. Once such consumers migrate outside the DISCOM supply framework, the distribution licensees would lose a significant portion of their **cross-subsidizing consumer base**. These consumers currently contribute to the **gross subsidy pool**, which supports lower tariffs for subsidized consumer categories. The rate of increase in subsidized tariffs may not be able to match the loss of cross-subsidy resulting from the exit of such consumers.

The **Electricity Act, 2003** recognized this risk and therefore provided for **cross-subsidy surcharge and additional surcharge**, so that distribution licensees do not suffer immediate and significant financial fallout from the migration of cross-subsidizing consumers. While the Act also envisages a gradual reduction of cross-subsidy, this objective has not translated effectively in practice.

In this context, the **National Electricity Policy should suggest clear pathways for continuous and gradual reduction of cross-subsidy while determining consumer tariffs**. The SERCs/JERCs should specify a **trajectory for reduction of cross-subsidy and cross-subsidy surcharge for each tariff control period**. At the same time, distribution licensees should undertake concerted efforts to continuously improve **operational efficiency and optimize power procurement costs**.

If distribution licensees are exempted from the Universal Service Obligation for consumers having contracted load of **1 MW and above**, the DISCOMs should also be **exempted from the mandated resource adequacy obligation for such consumers**. This would open up significant challenges for managing DISCOM's finances who have recently entered into or are planning to enter into long-term PPA for its consumers, including those who would exit its consumer base soon.

Without such explicit exemption under the **resource adequacy framework**, DISCOMs and the remaining consumers of the DISCOM would be saddled with significantly higher costs that would need to be recovered through tariffs. This would not only **decelerate the financial recovery of DISCOMs**, but also place them in a **seriously disadvantaged position in terms of retaining large consumers within their supply base**.

CER **Industrial Competitiveness Vs Viability of DISCOMs:** The proposal relating to improving industrial competitiveness through exemption from cross-subsidy and related charges may require a more balanced consideration of its implications for distribution licensees and the broader tariff structure. The current draft states that: *“State Commissions should exempt manufacturing enterprises, Railways, and Metro Railways from payment of cross-subsidies and surcharges.”*

The proposal to exempt manufacturing enterprises, Railways, and Metro Railways from cross-subsidy and related surcharges requires a more balanced assessment of its implications for distribution licensees and the broader tariff architecture. While reduction of tariff distortions is a legitimate regulatory objective, exemption from cross-subsidy does not, by itself, establish a clear or proportionate pathway to industrial competitiveness.

First, the relationship between electricity tariff reduction and industrial competitiveness is neither uniform nor necessarily strong across sectors. Competitiveness depends on the overall cost structure of production, including raw materials, labour, logistics, financing costs, technology intensity, and scale efficiencies. In many sectors, electricity constitutes only a limited share of total expenditure. Accordingly, even where electricity tariffs are reduced, the resulting impact on final product competitiveness may be modest unless the concerned industry is genuinely electricity-intensive. A general exemption, therefore, risks treating all manufacturing categories alike despite substantial heterogeneity in energy cost dependence.

Available financial data across manufacturing sectors suggests that energy expenditure constitutes a relatively modest component of total revenue for most industries. As illustrated in Figure 1, energy expenditure for the majority of manufacturing sectors typically lies in the range of about **0.5–28% of total expenditure**, with a number of key sectors recording below 5%.

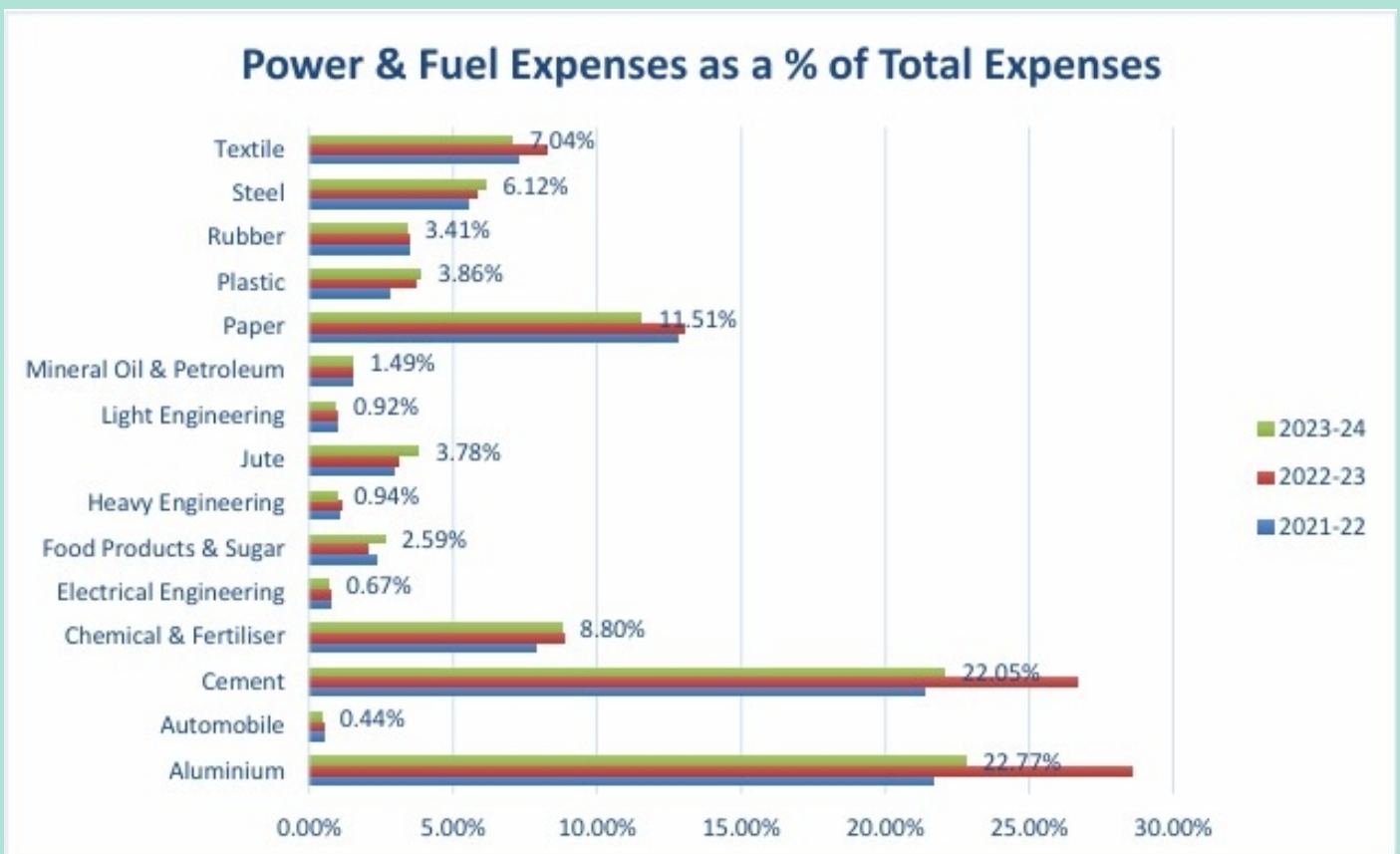


Figure 1. Energy Expenditure as a Share of Total Expenditure across Selected Industrial Sectors¹⁰

¹⁰Source: Analysis carried out by CER based on CMIE Prowess financial database.

Among these, **Aluminium and Cement sectors emerge as the two most energy-intensive industry in terms of direct expenses towards the same**, with electricity and fuel expenditure accounting for around **22-23% of total expenditure in 2022-23 and around 26-28% in 2023-24**. Paper, chemical & fertiliser and textile sectors record a power and fuel expenditure share of 7-12%. Some of the energy intensive sectors including Iron & Steel have captive mines used for captive generation, and hence do not incur significant direct expenditure on purchase of electricity from the distribution licensees.

It is also important to highlight that the energy intensive industries make use of captive generating capacity with captive coal mine or coal linkages. In case of the latter the energy purchase is in the form of coal, which is converted by the captive generating units into electrical energy.

Further, evidence indicates that **many energy-intensive industries already source a substantial share of electricity independently of the distribution utility supply framework**. Data on captive power plants suggests that industries consume approximately **190,495 GWh of electricity from self-generation out of a total industrial consumption of about 319,958 GWh**, implying that **nearly 60% of industrial electricity demand is already met through captive or self-generation sources**. Energy-intensive sector account for higher share of self-generation of electricity from captive power plants (Figure 2)¹¹. In **2023-24**, share of electricity consumed from self-generation was **88% in Aluminium, 77% in Paper, 76% in Fertiliser, 74% in Sugar, 73% in Non-ferrous industries, 62% in Iron & Steel and 58% in Cement**.

Captive electricity use is particularly pronounced in energy-intensive sectors. For instance, **Iron & Steel (~52,054 GWh), Aluminium (~46,099 GWh), Petroleum refining (~18,776 GWh), Cement (~16,100 GWh), and Chemical industries (~14,786 GWh)**. The sectorwise data clearly indicates that several industries already meet a dominant share of their electricity demand through captive sources.

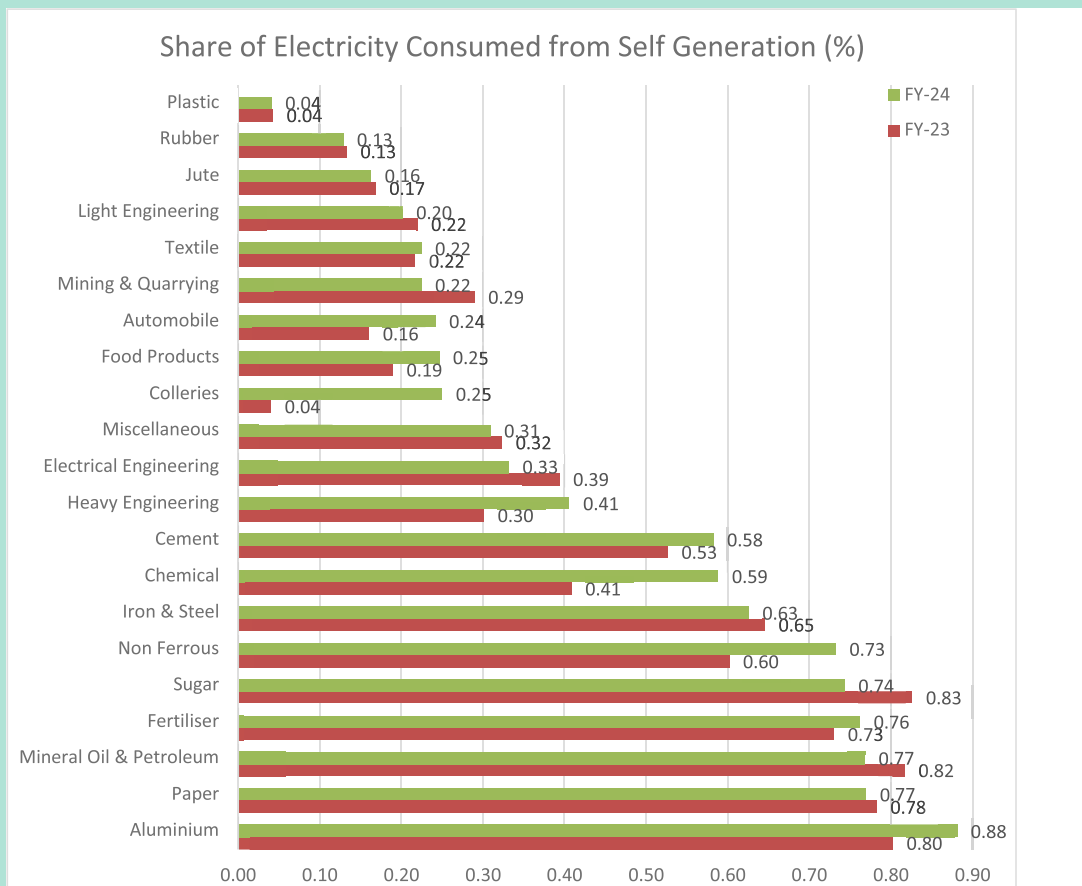


Figure 2. Industry-wise electricity generation and consumption from captive power plants¹²

¹¹Some of the sectors represent integrated as well as secondary processing firms operating therein

¹²Source: Industry-wise electricity generation and consumption by captive power plants (General Review 2024 & 2025, CEA).

These figures suggest that the industries with the higher energy intensity have lower dependency on DISCOMs, and rely more on captive generation. Apart from this, electricity procurement through traders or power exchanges via open access route, though in a limited manner, also substitutes procurement from DISCOMs. Consequently, the incremental 'competitiveness' gains from blanket exemption from cross-subsidy charges in retail tariffs may be limited for precisely those sectors that consume the largest volumes of electricity. Albeit this would significantly impinge on the financial viability of disoms. This, in turn, may force the DISCOMs to enhance fixed charges for tariff for industrial as well as other consumers.

A similar pattern is observable in the case of transport systems cited in the Draft. In the case of **Delhi Metro Rail Corporation (DMRC)**, electricity expenditure amounts to approximately **₹39,756 lakh** against total expenditure of about **₹9,74,938 lakh**, implying that electricity constitutes roughly **4.1% of total expenses**, as shown in Table 1 and Table 2. The dominant cost components of metro systems arise from capital investment, depreciation, financing costs, employee expenses, and infrastructure maintenance (Table 1). **Expenses towards overall electricity purchase represent only 4% of total expenditure in 2024-25 (Table 2)**. The share may be even smaller in case of other metro corporations with much lower network of routes.

Table 1. Expense Structure of Delhi Metro Rail Corporation (DMRC), 2024–25 ¹³

S. No.	Expense Category	Amount (₹ lakh)	Share in Total Expenses (%)
1	Operating Expenses	3,52,824	36.23
2	Employee Benefits Expense	1,92,350	19.74
3	Finance Costs	58,138	5.97
4	Depreciation & Amortisation	2,60,937	26.79
5	Other Expenses	1,10,688	11.35
	TOTAL EXPENSES	9,74,938	100

Table 2. Electricity Expenditure within the Overall Cost Structure of DMRC, 2024–25 ¹⁴

Item	Value
Electricity Expense ¹⁵	₹ 39,756.43 lakh
Total Expenses	₹ 9,74,937.90 lakh
Electricity Expense as % of total expenses	4.08 %

Table 3. Specific Electricity Consumption in Passenger and Freight Rail Services (kWh per 1000 Gross Tonne Kilometres)¹⁶

Service Type	Energy Source	Unit	2023-24	2024-25
Passenger Services	Electricity	kWh	18.80	18.70
Goods Services	Electricity	kWh	6.22	6.50

¹³Source: Annual Report 2024-25, Delhi Metro Rail Corporation Ltd.

¹⁴Source: Based on data from Annual Report 2024-25, Delhi Metro Rail Corporation Ltd.

¹⁵This also includes direct procurement of renewable energy by DMRC.

¹⁶Source: Indian Railways Year Book 2024-25

Likewise, operational statistics for **Indian Railways freight operations**, reported in Table 3, indicate a specific electricity consumption of approximately **6.5 kWh per 1000 gross tonne kilometres (GTKMs)**. After adjusting for the difference between gross and net freight weight, back of the envelop calculations suggest that this may translate to roughly **13 kWh per 1000 tonne-kilometres**. At an average electricity tariff of approximately **₹7 per kWh**, the electricity cost associated with transporting **1000 tonnes of goods over 1 km would be roughly ₹90–₹100**, or approximately **₹0.10 per kg for transport over 1000 km**. Relative to total logistics costs, which include wagon costs, handling, infrastructure charges, and other operational expenditures—the electricity cost component remains very modest. While electricity prices may influence costs for certain low-value bulk commodities, their overall impact on logistics competitiveness appears limited.

Taken together, these observations suggest that expenditure towards electricity procurement from DISCOMs, generally represents a smaller component of the broader cost structure governing industrial production and logistics systems. Accordingly, while electricity pricing reforms may improve cost efficiency at the margin, their overall influence on sectoral competitiveness must be assessed in the context of the full production and logistics cost structure. Removal of cross-subsidy may improve tariff neutrality by reducing distortions in retail electricity pricing; however, competitiveness in manufacturing and logistics is influenced by a much broader set of structural factors including raw material costs, labour productivity, capital intensity, logistics efficiency, and financing costs. **In the absence of empirical evidence demonstrating that cross-subsidy constitutes a binding constraint on industrial and logistics competitiveness, a blanket exemption and thus loss of cross-subsidising customer base would significantly undermine financial viability of DISCOMs, many of which are already reeling under burden of historical and present losses. This does not mean to suggest that inefficiency of DISCOMs should be shielded. The NEP should lay down a strategy to techno-commercial-regulatory pathway to transform the DISCOMs into competitive and profitable entities. A twinning approach wherein efficient best practices and experience sharing through inter-DISCOMs cooperation with profitable government and private DISCOMs help address the institutional and operational gaps.**

CER **Exemption from Service Obligation and under-recovery of fixed cost through tariff:** The prevailing tariff design across consumer categories is undermined by significant underrecovery of fixed costs through fixed charges. The cross-subsidising categories fare better in this context in comparison to the cross-subsidised categories. Departure of industrial consumers would further expose DISCOMs to the skewed cost structure as revenue stream becomes more riskier with rising share of behind the meter solar PV installations

Migration of industrial consumers outside the DISCOM's customer portfolio, or exemption from cross-subsidy-related charges, could significantly narrow the revenue base available for recovering capacity charges for PPAs and network costs while also supporting supply to subsidised consumer categories. Unless accompanied by a credible mechanism for revenue replacement, such exemptions may result in **increased tariff burdens on remaining consumers, greater dependence on state subsidy support, or deterioration in the financial sustainability of distribution utilities.**

In this context, rather than introducing blanket exemptions for select consumer groups, the policy may consider articulating a **clear and predictable national trajectory for the gradual reduction of cross-subsidy**, consistent with the statutory intent under the Electricity Act for progressive reduction of cross-subsidies. Such a calibrated approach would enable improvement in tariff neutrality while ensuring that the transition does not abruptly erode the cross-subsidy base, weaken DISCOM finances, or destabilise the tariff framework.

CER **Enforcement of RCO targets by SERCs:** In Clause 5: Generation, Sub-clause 5.1 Renewable Energy, Para 2, the Draft states that: “*State regulators must enforce RCO targets set under the Energy Conservation Act. Such obligations may be met by **procurement of green power or Green Attributes** or any other mechanism such as RCO Buyout under the framework **notified by the Central Government** and **suitable regulatory provisions shall be made by the Central Commission**. Policy measures shall be undertaken to **promote and incentivize co-generation as envisioned in the Electricity Act, 2003.**”*

While the intent of the provision is understood, the present formulation does not adequately reflect the institutional framework governing RCO enforcement under the existing statutory and policy architecture.

Under the current framework, the enforcement of RCO does not lie solely with the State Electricity Regulatory Commissions (SERCs). The responsibility is distributed across multiple entities under the Electricity Act, 2003 and the Energy Conservation Act, 2001 including the Bureau of Energy Efficiency (BEE), Appropriate Governments, and Regulatory Commissions, each operating within its respective jurisdiction.

Further, the statement that “*suitable regulatory provisions shall be made by the Central Commission*” may require clarification. The Central Electricity Regulatory Commission (CERC) would typically come into picture only in relation to mechanisms such as trading of green attributes or buy-out frameworks, where a centralized market or national-level mechanism is involved.

However, procurement of green power remains primarily within the domain of the State Electricity Regulatory Commissions, as part of their tariff-setting and regulatory jurisdiction over distribution licensees and obligated entities within the State. The present wording may therefore create an unintended impression that the Central Commission is responsible for regulatory provisions relating to procurement of green power.

It is therefore suggested that the text may be recast to clearly distinguish between:

- State-level regulatory responsibility for procurement and compliance monitoring of green power obligations; and
- Central-level mechanisms, such as green attribute markets or buy-out frameworks, where the Central Commission may play a role.

Such clarification would ensure consistency with the Electricity Act, 2003, the Energy Conservation Act framework for RCO, and the earlier National Electricity Policy approach, while also avoiding potential ambiguity regarding institutional responsibilities for implementation and enforcement.

CER Promotion of Co-generation for Non-renewable Sources: In Clause 5 (Generation),

Subsection 5.1 (RE), Para 2 states:

“Policy measures shall be undertaken to promote and incentivize co-generation as envisioned in the Electricity Act, 2003.”

This appears to be incorrectly stated. The **Electricity Act, 2003** specifically refers to **promotion of co-generation from renewable energy sources**, and not co-generation in general (i.e. including non-renewable sources). Accordingly, the provision may be recast to align with the Act as follows: *“Policy measures shall be undertaken to promote and incentivize co-generation from renewable energy sources as envisioned in the Electricity Act, 2003.”*

CER Institutional Responsibility for Development of Electricity Markets: In Clause 5 (Generation), Subsection 5.1 (RE), Para (3) on Market-Based RE Growth, the draft states that: *“The Central Government shall evolve appropriate market-based frameworks and the Central Commission shall make the necessary regulatory provisions for mechanisms such as Virtual Power Purchase Agreements and Bilateral Contract Settlement to attract investments in non-fossil fuel-based generation capacities.”*

In line with the provisions of the Electricity Act, 2003 (Section 66), development of electricity markets lies within the domain of the Appropriate Commission. Accordingly, the development of market-based frameworks lies with the Commission. In the case of a nationwide market, CERC has played vital role of issuing relevant market regulations.

The Central Government may provide policy direction, strategic guidance, and enabling signals for market evolution, but it does not evolve the market framework itself. The present wordings blur the institutional responsibility. This may also avoid legal disputes that may arise in the context of design and operationalization of market mechanism in future.

It is suggested that the provision may be recast to reflect that the Commission develops the market framework and corresponding regulatory provisions, while the Central Government provides policy direction to facilitate such market development.

CER Clarification on Role of Distribution Licensees in RE-Storage Deployment: In Clause 5 (Generation), sub-clause 5.1 (RE), Para (5) RE with Storage, the draft states: *“Hybrid projects (VRE plus storage) should be promoted for reliability and optimized transmission use. Distribution licensees should build local RE with storage to reduce*

losses. Governments and regulatory commissions must support such projects and specify CUF targets.” (emphasis added)

The present wording does not appear consistent with the prevailing institutional and operational framework of the power sector. Distribution licensees generally do not develop generation assets, as the development of generation capacity is typically undertaken by generating companies, including State GENCOs or independent power producers. Distribution licensees primarily function as procurement and supply entities responsible for power purchase and delivery of electricity to consumers, rather than developers of generation or storage infrastructure. Role of storage is envisaged for ensuring reliable grid operation including addressing congestion in a cost-effective manner.

Further, procurement of storage or other flexibility resources should ideally be guided by appropriate RE integration studies. Such studies help identify optimal locations, capacity requirements, and the most suitable flexibility options, thereby avoiding inefficient investments and ensuring that deployment of flexibility resources is aligned with actual grid conditions, renewable integration requirements, and loss reduction objectives.

Accordingly, the present statement may not accurately reflect the institutional roles and operational practices within the electricity sector. It may therefore be more appropriate to reframe the provision as follows: *“Distribution licensees should get into agreements with local RE with storage, or standalone storage, or demand response resources, based on appropriate RE integration studies, to reduce losses.”*

This revision would **better reflect the institutional roles within the electricity sector, recognize the role of demand-side flexibility, and ensure that deployment of RE-storage and other flexibility resources is supported by appropriate technical and system-level assessments.**

CER Demand Response and Aggregator Participation: The above clause may also appropriately recognize the role of demand response as a flexibility resource in the distribution system. Demand response is a recognized flexibility mechanism capable of supporting RE integration, reducing peak demand, and alleviating congestion in distribution networks. In several cases, **demand response can provide a more cost-effective and operationally efficient alternative to physical storage or additional generation capacity, while still contributing to improved system reliability and reduction of technical losses.**

The policy proposes the promotion of demand response programmes by distribution licensees. However, a clear regulatory framework is required to enable participation of demand response resources and aggregators in electricity markets.

Accordingly, State Commissions may develop regulatory frameworks for demand response programmes, while model regulations for such mechanisms may be developed through the Forum of Regulators to ensure consistency across states. In addition, an aggregator model may be introduced to enable aggregation of demand response resources and facilitate their participation in electricity markets.

CER Clarification on P2P Trading and Surcharge Exemptions: In Clause 5 (Generation), Subsection 5.1 (RE), under Consumer-Driven RE & P2P Trading, the draft states that: *“Rooftop solar with storage, peer-to-peer (P2P) energy trading, and Open Access to RE, free from surcharges must be promoted.”*

Peer-to-peer (P2P) energy trading mechanisms already exist in principle, as by displacement, electricity generation at the distribution end is consumed largely by other consumers thus reducing network losses. However, with increase in behind the meter RE penetration, it may not be absorbed locally and may need to be either stored or wheeled across the grid for consumption. With growing share of renewables, more and more of network cost burden falls on conventional sources as it alters the relative prices while consumers bears the whole burden in any case. Significant role of P2P transaction may be limited by the increased complexity of transactions, the associated hardware, network and data center cost and associated energy consumption. **NEP should lay down clear roadmap to evaluate technoeconomic drivers for large scale P2P trading and its cost impact on the DISCOMs and the end consumers. Successful pilots based on their economic drivers and contribution to grid stability and resilience should grid adoption of P2P trading. An integrated regulatory framework covering demand response, P2P trading, energy storage and reliability services may be promoted through a regulatory sandbox approach and piloted in selected areas of DISCOMs across selected states with necessary grid preparedness.**

CER Repowering of Aging RE Projects – Coordination with DISCOMs: In Clause 5 (Generation), Subsection 5.1 (RE), under Repowering, the draft states: *“Aging RE projects must be upgraded with efficient technologies.”*

While the intent to promote repowering is appropriate, the provision may require further clarity from the operational and contractual perspective. Repowering of existing RE projects may involve changes in installed capacity, generation profile, and grid injection, which have implications for existing power purchase arrangements and network planning.

Accordingly, repowering should be undertaken with provision for first right of revision/refusal with the appropriate DISCOM, particularly where the existing project is tied to a power purchase agreement with the distribution licensee. Further, any revised capacities arising out of repowering should be undertaken only after establishing system feasibility and ensuring compatibility with the existing grid and contractual framework. **To ensure that the price discovery mechanism adopted for such repowered capacity is competitive, the Swiss Challenge approach for public private partnership (PPP) may be adopted. The Ministry may issue appropriate guidelines for implementing the same.**

It may therefore be appropriate to revise the provision as follows: *“Aging RE projects must be upgraded with efficient technologies and on competitive basis, with provision for first right of revision/refusal with the appropriate DISCOM, and such revised capacities should be undertaken only after establishing system feasibility.”*

CER Capacity Market and Short-Term Trading under Resource Adequacy:

Variation in demand and supply mix, resulting in imbalance between the expected demand and the tied-up resources under the applicable resource adequacy framework, also opens up avenues for short-term trading of 'capacity'. Development of such a 'Capacity Market' would enable distribution licensees as well as large captive/open access consumers, to ensure their RA compliance while also providing a window for offloading excess capacity for short-term period for those who have tied up excess resources.

The ministry and CERC should spearhead consultation process for developing a framework for Capacity Market that is suitable for the Indian context, which does not mandate market participation by all generation resources. This would require a robust compliance mechanism, capacity monitoring with transparent information sharing, and a robust market monitoring framework. A pilot may be introduced by CERC under Regulatory Sandbox approach, wherein Grid-India may develop tools and mechanism for tracking capacity and contractual obligations. The compliance mechanism must ensure penalty in the form of regulated capacity contract at best available price in case an obligated entity fails to do so.

CER Mandatory Implementation of AGC and Unified Ancillary Services Framework: Mandatory implementation of AGC should be rolled out within a period of 2–3 years of issue of this policy. All thermal generating units which have been set up over the past 10 years should be brought under AGC on priority basis. The Forum of Load Despatchers (FoLD) as well as FoR should engage in stakeholder consultation to get necessary buy-in from the generators to accelerate this process. The Central Government may provide partial financial support for accelerated implementation of AGC for intra-state generating stations, this will further enable participation of intra-state generating stations into the national level ancillary services market.

Frequency Control Ancillary Services are best delivered through a Unified Ancillary Services market mechanism, as being implemented through SRAS and TRAS. However, in case of localized Ancillary Services requirement, for example for voltage support and black start services, localized/state/region specific mechanism may be designed through stakeholder discussions at FoR and FoLD.

The proposal for time-bound AGC implementation is appropriate in view of increasing renewable penetration and the need for enhanced grid flexibility. However, uniform technical standards, telemetry requirements, and clear cost recovery mechanisms must be specified to ensure consistent implementation across jurisdictions. Accordingly, it is suggested that AGC rollout be supported by harmonized regulatory provisions and coordinated institutional framework so that ancillary services are delivered efficiently without market fragmentation.

CER Regulatory Framework for Price and Volume Hedging: In the absence of an appropriate regulatory framework for price and volume hedging by the regulated entities, their participation under such contracts would remain limited. A

regulatory framework enabling such risk hedging strategies should be permitted in a cost-effective way and a framework for cost-effective risk hedging.

The recognition of hedging constraints for regulated entities is important, particularly in the context of evolving market-based mechanisms such as capacity markets and bilateral contract settlements. Without explicit regulatory clarity on admissibility of hedging costs and prudence checks, regulated entities may remain risk-averse, thereby limiting effective market participation.

Accordingly, it is suggested that an enabling regulatory framework be developed specifying permissible hedging instruments, exposure limits, prudence norms, and cost pass-through principles to ensure risk mitigation while safeguarding consumer interests.

CER Unified National Grid Code: Even though the country has a single synchronized grid, the Grid Code as well as operational practices differ at the inter- and the intra-state level, as well as across the states. To ensure grid reliability and its resilience, the country should adopt a harmonized **Unified National Grid Code with due consideration of differentiated timelines to address sequential operational requirements at the inter- and the intrastate level in a progressive manner with clear timeline for harmonisation of critical aspects of grid operation. A Unified National Grid Code would also ensure development of a nationwide market for ancillary services especially through participation of entities at the intra-state level. This would also support nationwide adoption of AGC, SCUC, and market-based mechanisms.**

CER Intra-State SCED and Unified SCUC Framework: With expansion of market-based dispatch mechanisms, consideration of Intra-State Security Constrained Economic Dispatch (SCED) and a unified framework for Security Constrained Unit Commitment (SCUC) is essential. Fragmented dispatch mechanisms between inter-state and intra-state systems reduce system optimization and increase overall procurement costs.

Accordingly, it is suggested that **a harmonized and unified framework for SCED and SCUC be developed, integrating intra-state generators progressively to enhance system-wide efficiency.** EAL, IIT Kanpur evaluated alternative market designs using **SCED, MBED, and SCUC models** to assess potential efficiency gains in the Indian power market. The results indicate that expanding SCED participation beyond ISGS to include **SGS and IPPs** increases cost savings, primarily through better utilization of lower-cost generation resources.

A centralized MBED framework, records additional marginal savings in system-wide costs compared with decentralized state-level SCED. The magnitude of savings decline further when realistic operational and regulatory factors such as transmission charges, non-linear generation costs, heat rate deterioration, ramping constraints, and incentive mechanisms are incorporated. The SCUC simulations also demonstrate potential efficiency gains, with moderate savings compared to self-scheduling based on unit commitment, while substantial when compared against the economic dispatch model at the state level. Overall, the findings suggest that while centralized dispatch mechanisms can enhance operational efficiency, the net economic benefits are relatively modest and must be evaluated alongside implementation challenges, cost-sharing arrangements, and existing regulatory incentives.

CER Independent Market Monitoring and Transparency Framework: With deepening of power markets, including capacity markets and bilateral contract settlement mechanisms, an independent and structured market monitoring framework becomes essential. Market reporting should go beyond publication of transaction statistics and include analytical monitoring of price behavior, bid concentration, and potential market power. Further, summary outcomes of the Market Surveillance Committee of power exchanges should be placed in the public domain to enhance transparency. **A study undertaken by the Centre for Energy Regulation (CER), analysed prevailing framework for market monitoring and international best practices. It suggested a framework for implementation while considering various aspects including information dissemination and use of tools to enable market data analysis on daily, weekly and monthly basis.** Accordingly, it is suggested that an independent market monitoring mechanism be institutionalized under the Central Commission, with periodic analytical reports to ensure market integrity and consumer protection.¹⁷

¹⁷ Singh, A., Shivhare, M. and Anand, H., 2025. Market Monitoring Framework for the Indian Power Sector. Kanpur: Centre for Energy Regulation (CER), Department of Management Sciences, Indian Institute of Technology Kanpur. Submitted to Central Electricity Regulatory Commission (CERC), New Delhi.

A Market Monitoring Framework for the Indian Power Sector

(Outcomes of a study by CER, IIT Kanpur)

Key Recommendations

1. **Need of Advanced Market Monitoring Tools:** The Commission may consider the development and deployment of advanced analytical tools for automated assessment of market competitiveness and bidding behaviour in electricity markets.
2. **Adoption of PROMPT Market Monitoring Dashboard:** The Commission may leverage the Power Sector Regulatory Oversight and Market Performance Tracking (PROMPT) dashboard developed by CER, IIT Kanpur to strengthen real-time monitoring of market performance and participant behaviour.
3. **Institutionalise Automated Market Reporting:** The regulatory framework may enable automated generation of daily, weekly, and monthly market monitoring reports to support timely regulatory oversight and evidence-based decision-making.
4. **Continuous Enhancement of Monitoring Tools:** The Commission may encourage periodic enhancement of analytical tools to align with the evolving structure and dynamics of the Indian power market, including increasing participation and new market products.
5. **Establish an Independent Market Monitoring Unit (MMU):** The Commission may consider establishing an independent Market Monitoring Unit (MMU) responsible for monitoring short-term electricity transactions across all power market platforms.
6. **Define Governance and Operational Framework:** A clear governance structure, scope, roles, and responsibilities for the MMU should be defined to ensure transparency, accountability, and independence in market oversight.
7. **Strengthen Data Sharing and Transparency:** The regulatory framework may mandate standardized data-sharing protocols and transparent reporting mechanisms to facilitate effective market monitoring.
8. **Empower MMU with Data Access:** The MMU should be empowered to seek and access relevant data from all market platforms, exchanges, system operators, and other relevant entities required for market monitoring.
9. **Reporting and Enforcement Mechanism:** The MMU should report any instances of data non-compliance or potential market manipulation by market participants to the Central Commission for appropriate regulatory action.

CER **Transmission Connectivity and Stranded Asset Risk:** Availability of transmission remains critical to reliable operation of the power system and influences investment in generation. Growing investment in transmission sector with limited competition has also driven costs higher in a regulated environment with significant increases in the per unit transmission cost burden for the end consumers. This is expected to rise even further. The current mechanism for 'guarantee' connectivity to RE plants with minimal financial commitment has also resulted into significant 'stranded' assets.¹⁸ Absence of sufficient financial stake by the investors should be established, to ensure that the burden of stranded assets does not fall on the consumers.

CER **Deployment and Role of Microgrids:** In the proposed Clause 5.1 (12), "*Microgrids: RE based microgrids must be developed for remote and rural areas and integrated with main grid where feasible.*"

The policy recognises the role of RE based microgrids for remote areas; however, the criteria for deployment of new microgrids and the treatment of existing minigrid systems require further clarity.

Microgrids should preferably be deployed in areas where grid extension is uneconomical due to difficult terrain, seasonal inaccessibility, or extremely high infrastructure costs. Additionally, clear regulatory provisions should be developed for the treatment and integration of existing mini-grids once the main grid arrives, including tariff arrangements and asset utilisation.

¹⁸ CERC (2025), "Staff Paper on Proposal for allocation of Connectivity granted (on LOA route) where the signing of the PPA/PSA is getting delayed", <https://cercind.gov.in/2025/staff-paper/SP-251125.pdf>

In disaster-prone regions and geographically remote areas, resilient microgrids may be considered as a primary source of electricity supply for critical infrastructure such as healthcare facilities, emergency services, and agricultural extension centres.

CER Transmission-optimised Siting of RE Projects: The policy suggests that RE projects should preferably be located near load centres to optimise transmission costs. **The overall economics of harnessing RE should be guided by the resource intensity as well as the applicable transmission cost and losses thereof.** Solar energy can be harnessed with decent capacity utilisation factor across most of the states. **Choice of multiple geographically dispersed sites for RE procurement** also avoids the risk of widespread cloud cover affecting solar energy generation or significant localised variation in wind intensity. This should be weighed against deployment of economic storage in terms of overall economics and reliability. **Long-term RE integration modelling using optimisation approach may help DISCOMs discover a reasoned answer to this question.**

CER Coal Supply Chain Readiness and Coordination: Coal-based thermal power plants face significant challenges related to the readiness of the coal supply chain, including issues related to coal availability, transportation infrastructure, coal quality, and contractual arrangements. These challenges adversely affect the cost competitiveness of coal-based electricity generation. Coal quality not only affects the economics of producing electricity but also operationally affects the generating units. NEP may propose a detailed roadmap, in coordination with the Ministry of Coal and Ministry of Railways for **coal supply chain monitoring from the mine seam to the delivery station at the power station with traceability of wagon wise source.** This would also ensure that the coal sampling for quality assessment is not compromised as multiple sampling would help ascertain source wise and customer wise quality differential that can be either linked to the quality at source or that deteriorated during the transportation. **AI-based tools incorporating GPS based data to analyse the pictorial inputs captured at multiple locations across the supply chain.** This investment would pay for itself as it would help address coal leakage and quality degradation thus reducing final cost to the generating plants and the final consumers.

To address the coal quality issues and implement the suggested solutions, **a joint working group comprising senior officials from the Ministry of Power, Ministry of Coal, and Ministry of Railways may be constituted.** This would also help to identify supply chain bottlenecks, transportation constraints, and contractual/payment issues affecting coal supply.

CER Flexibility Requirements in Thermal Power Plants: Increasing penetration of RE in the power system places greater demand for flexibility from power system constituents, including conventional generators and demand-side resources. **Investments in flexibility should be evaluated in terms of its economics vis-a-vis alternate solutions (such as demand response, storage etc.) to enhance flexibility of the power system.** Two specific interventions in the context of coal-based thermal power plants – (i) Minimum Technical limit (MTL) (ii) Ramp rate need to be evaluated on their own merit. While some units may need intervention of the first kind, the others may need to focus more on the second one. **A study may be undertaken to evaluate relative merit of such investments vis a vis implementation of demand response and economically viable energy storage.**

The CEA (Flexible Operation of Coal-based Thermal Power Generating Units) Regulations, 2023 mandates that coal-fired power plants reduce their minimum technical load (MTL) to 40% to accommodate high RE integration by 2030. Retrofitting majority of the existing coal-based power plants for flexible operation may significantly increase the cost of power procurement for distribution licensees and ultimately for consumers. **Phased flexibility investment should therefore be prioritised for marginal (i.e. those with high energy charges) plants that hit the MTL or the ramp limit. Plants reaching near their end of life should not be a candidate for such investment. Alternate and more economical options should be exercised to bring about greater flexibility in the power system.**

It is also important to note that enhanced flexibility operation may increase the variable cost of certain plants, which could affect their position in the merit order. **The additional energy cost for incremental flexibility may therefore be recoverable separately including through market-based procurement of flexibility services and should not affect the merit order.** This would ensure that the sector adopts a **technology-neutral approach to promote power system flexibility.** This would then require that RoE incentive provided in the CERC's Terms and Condition for Tariff be discontinued else this would result in double cost burden on DISCOMs.

CER Utilisation of Steam for District Cooling: The draft proposes utilisation of steam generated from thermal power plants for district cooling applications. Such utilisation effectively falls under the broader framework of cogeneration and may improve the overall thermal efficiency of the system.

If district cooling is undertaken for captive purposes, it may not pose regulatory concerns. However, where chilled water is supplied to third parties, appropriate contractual arrangements and regulatory clarity would be required. In such cases, the regulatory framework for tariff determination of electricity generated from such cogeneration plants should consider the improved overall efficiency achieved through simultaneous delivery of electricity and cooling services. Such systems may also find potential applications beyond conventional urban cooling clusters. For instance, cogeneration plants may provide both electricity and chilled water to energy-intensive facilities such as data centres located in proximity to thermal plants.

CER Blending of Alternative Fuels in Thermal Power Plants: The policy suggests incorporation of alternative fuels such as biomass and municipal solid waste in thermal power plants. The experience of biomass co-firing should be comprehensively evaluated in terms of its net environmental and economic impact.

Procurement of biomass for co-firing often faces challenges related to lack of competitive markets, limitations in aggregation mechanisms, and issues in monitoring calorific value and quality through third-party sampling.¹⁹

Accordingly, greater clarity and empirical assessment of the outcomes of biomass co-firing initiatives may be required, including regulatory provisions governing cost recovery and quality monitoring.

CER Life Extension and Investment Evaluation: Modernisation and efficiency improvement of thermal power plants nearing the end of their life under a regulated cost environment should only be undertaken if the overall cost of such investment is competitive with new capacity over the remaining and extended life of the project. This decision should be an outcome of the resource adequacy exercise that makes due consideration of the overall cost of power procurement for the DISCOM. **Flexibility of the candidate thermal generation (for life extension) should be an additional criteria while evaluating such investment.**

Accordingly, **evaluation of life extension proposals should be undertaken as an integral part of the resource adequacy exercise**, at least 7–8 years in advance, enabling beneficiaries to assess the economics of extending existing PPAs versus procuring new longterm capacity through alternative technological choice. In such cases, the first right of refusal should remain with the beneficiaries who have borne the capacity charges of such plants over their entire operational life.

CER Institutional Mechanisms for Coal Quality Assurance: The policy states that coal suppliers should assume responsibility for coal quality on an “as-delivered” basis to mitigate generation losses arising from grade slippage. **The policy should also provide guidance for the institutional or contractual mechanisms enforcing the same.**

In practice, ensuring accountability for coal quality may require stronger risk-sharing arrangements between coal suppliers and thermal power plants. **One possible (theoretical) approach could involve swapping a limited amount of the equity stake between the coal supplier and the thermal generating companies** thereby aligning incentives and ensuring greater responsibility for quality of coal supplied. While proposal carries its own implementation challenges, it would be a **credible hedging mechanism for the inherent risk across the supply chain.**

CER Utilisation of Fly Ash: With the addition of more than 90 GW of coal-based generation capacity, fly ash generation is expected to increase significantly. This would require urgent and advanced measures to ensure utilisation of fly ash from the Date of Commercial Operation (CoD) of new plants. The MoP guidelines, issued in March 2024, may be converted to a mandate through stakeholder consultation. **A National Fly Ash Mission, mandating commercial utilisation of fly ash in the construction sector, may be initiated through the policy.** The policy should mandate a framework for monitoring and compliance associated with fly ash generation, transportation, storage, utilisation and disposal thereof.

CER Voltage Support and Grid Inertia: The policy proposes repurposing inefficient thermal plants as synchronous condensers for providing voltage support and grid inertia. **The policy may propose pilot studies, by Grid Controller**

¹⁹An ongoing research at IIT Kanpur identified some of the supply chain related issues.

of India Ltd., to evaluate the technoeconomic feasibility of converting retired thermal units into synchronous condensers and to assess the potential benefits in terms of ancillary services and system stability, and associated cost thereof.

CER Hydropower Development and Cost Escalation Risks: Hydropower projects can play an important role in India's energy transition and diversification of the energy mix. However, significant project delays and cost escalations often make such investments less competitive compared to other technologies. Under the existing regulatory framework, a substantial portion of project risks, including cost overruns, are passed on to beneficiaries and ultimately to consumers. While regulated returns continue to incentivise investment, developers may not bear sufficient accountability for delays attributable to project management. Accordingly, the return on equity for hydropower projects should be linked to timely completion of projects, and developers may be required to share part of the risks associated with delays attributable to their project management practices.

CER Climate Resilience for Hydro Generation: The policy recognises the role of storage-based hydropower projects in flood moderation, irrigation and energy security. However, while hydropower projects may contribute to climate adaptation, their own **resilience to climate risks especially hydrological variability also needs to be addressed.** Appropriate measures may therefore be considered to assess and strengthen the climate resilience of hydropower projects, particularly given their long operational lifetimes. **The policy may provide for a multi-institutional study to evaluate climate risks for the hydro power plants.**

CER Resource Adequacy: In the proposed Clause 3 (3) *“Resource Adequacy Plans (RAPs): CEA, in consultation with relevant State Government departments and key stakeholders, will prepare national-level RAPs for generation and transmission, ensuring adequate reserve margins and grid reliability. SLDCs and distribution licensees will prepare State and distribution utility level RAPs, aligned with national plans. Regulatory commissions will frame supporting regulations.”*

Multiple aspects are emphasised here in the context of the RAP.

- **Optimising long-term RAP** – The RA plans do not disclose an assessment of the projected cost of power procurement under alternate and the suggested plan. This is not in line with the spirit of the Electricity Act 2003, which clearly mandates economy in conduct of the procurement
- **RA by grid interactive loads** – Apart from the distribution licensees, RAP needs to be emphasised for entities with captive generation and those with long-/medium-term open access.
- **Planning and operative reserve margin** - Apart from the distribution licensees, entities with captive generation and those with long-/medium-term open access should also provide for planning as well as operating reserve. In its absence, the cost burden for distribution licensees and its customers would be higher.

The planning framework should incorporate state-specific and DISCOM-specific factors, including appropriate planning reserve margins, to ensure reliable and economically efficient resource procurement aligned with local system conditions.

CER Competitive Bidding for Transmission Infrastructure: In the proposed Clause 8.4 (1) *“Competitive bidding shall be the default mode for all inter-, and intra-state transmission projects. State-owned Transmission licensees may also be encouraged to participate in such bidding. Exceptions may be permitted only for urgent, strategic or technically critical projects in accordance with the framework prescribed by the Appropriate Government.”*

In cases where exceptions to competitive bidding are permitted for urgent, strategic, or technically critical transmission projects, the **Swiss Challenge approach** may be considered to ensure adequate competition and transparency in the selection process. Such an approach would help maintain competitive efficiency while facilitating timely development of transmission infrastructure of strategic importance.

CER Uniform Compensation Framework for Transmission Corridors: The clause provides for compensation mechanisms for land value in transmission corridors and optimisation of right-of-way corridors.

A uniform compensation framework may be considered for both inter-state and intrastate transmission

networks to ensure consistency and fairness in compensation for land value diminution associated with transmission corridors.

CER Transmission Planning for Emerging Non-Fossil Energy Projects: The clause proposes proactive development of transmission infrastructure for non-fossil generation and demand zones, including dedicated green feeders.

Recent developments in green hydrogen projects have generated considerable enthusiasm and have led to the creation of transmission infrastructure in anticipation of project development. However, in several instances delays or non-implementation of such projects have resulted in stranded transmission assets, placing financial burden on the end consumers.

While promoting non-fossil energy sources, transmission planning and infrastructure development should be undertaken with adequate safeguards to avoid stranded assets. **Any policy enabling proactive development of transmission infrastructure should be supported by firm commitments and upfront financial assurances from project developers to ensure that distribution licensees and end consumers do not bear the burden of underutilised transmission infrastructure.**

CER Cross-Border Electricity Trade and Interconnections: In the proposed Clause 8.6 (3) “Cross-border interconnections shall be strengthened under the overall vision of One Sun One World One Grid (OSOWOG). India will actively promote the cross-border exchange of RE to support regional energy transition efforts. Harmonised regulations shall be developed to facilitate cross-border electricity trade, and India will play a leadership role.”

Cross-border interconnections can enhance India's ability to integrate and absorb a higher share of RE and strengthen the country's energy security. However, such interconnections should be pursued based on technology readiness and overall project economics. In particular, projects involving subsea cables, which require significant capital investments, should be carefully evaluated against alternative options such as energy storage technologies and demand response mechanisms to ensure cost-effective system planning.

CER Distribution Sector Sustainability and Market Competition: In the proposed Clause 9, “Distribution is the most crucial part of the power sector directly serving consumers and generating revenue for the entire sector. The Central and State Governments as well as Regulators shall ensure the financial sustainability of the distribution sector, and undertake the following measures:” and in the proposed Clause 4 (5), “**Building a Competitive Market:** Competition across the power sector must be promoted to benefit consumers. Currently, distribution licensees are obligated to supply power to manufacturing industries and railways, even if these consumers are capable of sourcing power independently. This compels DISCOMs to contract power for such consumers, leading to underutilization and fixed cost burdens. To recover these costs, State Commissions impose high cross-subsidy and surcharges, raising industrial tariffs and reducing competitiveness. The Act allows generators and traders to directly supply electricity to consumers under Open Access, and State Commissions must not stifle competition with cross-subsidy and additional surcharges. **It is suggested that Regulatory Commissions, in consultation with Appropriate Governments, may exempt the distribution licensees from the Universal Service Obligation in respect of consumers having a contracted load of 1 MW and above, capable of self-procurement. State Commissions should exempt manufacturing enterprises, Railways, and Metro Railways from payment of cross-subsidies and surcharges. These measures will ensure that Indian goods remain competitively priced, cost of logistics is optimized and commuting costs of workforce come down. Regulatory Commissions should create appropriate frameworks to enhance market liquidity and ensure availability of power at competitive prices.**” (emphasis added)

Clause 9 emphasises the need to ensure financial sustainability of the distribution sector. However, the provisions under Clause 4(5) proposing exemption of large consumers (≥ 1 MW), manufacturing enterprises, Railways and Metro Railways from cross-subsidies and Universal Service Obligation may be inconsistent with this objective. As highlighted earlier, cost associated with energy/electricity purchase constitutes a miniscule proportion of such consumers for the electricity purchased from the DISCOMs. In case of energy intensive industries, such consumers have limited dependence on discoms due to substantial captive generation capacity. (see discussion above based on energy cost data across key sectors).

Large industrial and commercial consumers constitute a significant revenue base for DISCOMs. Their migration through without cross-subsidy contributions would adversely impact the financial viability of distribution utilities. While improving DISCOM performance is essential, such improvements would be further delayed with loss of crosssubsidising consumers.

Accordingly, a **balanced and phased approach may be considered to ensure that promotion of competition and open access does not undermine the financial sustainability of DISCOMs during the transition period.**

CER Cost Optimisation and Market Participation: In the proposed Clause 9 (1), *“Cost Optimisation: Appropriate Commission should provide distribution licensees enough freedom to take timely, market-based decisions for power purchase to ensure reliable and good quality supply. Efficient energy portfolio management should be encouraged to reduce power purchase costs. Training programmes will be introduced to help utility staff build the skills needed to manage market operations.”*

While providing distribution licensees with greater flexibility to undertake market-based procurement decisions, adequate regulatory safeguards should be ensured. Capacity building through structured training programmes is essential to enable effective participation in evolving electricity markets. **Availability of sufficient human resources for key commercial functions including market-based procurement with DISCOMs and with the SLDCs is critical to enable them to take informed decision with sufficient in-house capability.**

Such training programmes should include load dispatchers, DISCOM personnel and regulatory commission staff, and should cover technical, operational, financial and regulatory aspects of power market operations. These programmes may be delivered through online platforms to ensure wider accessibility and continuous skill development.

CER Competition and PPP in Distribution: Carriage and content separation remains international gold standard for introducing retail supply competition. Multiple distribution licensee may not only lead to over investment (and hence high cost to the DISCOM) but also open up multiple avenues for disputes on account of a variety of legal, technical and operational challenges. In fact, apart from Mumbai, there are no examples of scale to demonstrate efficacy of the model across the world. Issues such as network connectivity, energy accounting and settlement mechanisms may become complex and may create larger scope for disputes among competing retailers.

Accordingly, introduction of retail supply competition should be initiated as a pilot across selected distribution license areas providing regulatory template for further finetuning while comparing alternate models for introducing the same.

CER A Business Sandbox Approach to PPP: Public private partnership (PPP) models can be suitably designed for identified business segments of a distribution licensees with clearly identified baseline, performance target and incentive/penalty structure with transparent performance measurement and compliance framework.

The distribution network in an identified area of the distribution licensee is handed over to an O & M operator through PPP (BOT or BOOT route for example) model based on reverse (competitive) bidding with benchmark18 average O & M cost as per recent regulatory approval with adjustment for load density, asset quality, consumer mix, desired standard of performance (SoP) etc.

CER Asset securitisation and Listing of government companies: The power sector offers numerous avenues for unlocking the value in the generation, transmission and distribution assets across the country. While remaining dominantly government owned, such public listing can help raise financial resources while also enabling the respective state government to use the listing proceeds from partial sale of its equity for infusing capital in the laggard segments of the sector in the respective state.

Carriage and content separation, even without introduction of retail supply competition, can offer opportunities for asset monetisation of the distribution licenses. This would further enable some of the distribution licenses to enable their listing.

Network business, which is inherently less risky (and hence has lower beta²⁰), and is relatively less exposed to political decision-making, remains a preferred candidate for unlocking the asset value in the sector across the states.

CER Adoption of New Technologies: New technologies should be adopted only after proper technical and economic

²⁰Kewal Singh, Anoop Singh, Puneet Prakash, 2022, "Estimating the cost of equity for the regulated energy and infrastructure sectors in India" Utilities Policy, <http://dx.doi.org/10.1016/j.jup.2021.101327>

evaluation. It should be demonstrated that the investment leads to measurable savings or operational improvements.

Further, after implementation, it should be assessed whether the benefits realised are actually attributable to the technology or due to other system improvements. Since stakeholders may have different perspectives regarding technology adoption, their participation and buy-in²¹ should be ensured by clearly demonstrating the expected benefits.

CER Smart Grids and Smart Metering: Investment in smart metering infrastructure has potential benefits enabling improvement in operational as well as financial performance of the DISCOMs. **Apart from billing and collection (in case of pre-paid meters), the smart meter data provides useful insights for tariff design, and design and implementation of demand response program.** However, it is observed that apart from billing and collection, **value of the smart metering infrastructure has not been unlocked in a desirable manner.** In fact, access to such data remains limited to support meaningful research relevant in the Indian context.

In the absence of a regulatory framework for cost–benefit analysis, consumers continue to bear the cost of new technologies which may or may not add value to the electricity sector and the end consumers. Techno-economic impact assessment of the smart metering investment across DISCOMs should be undertaken to enable the regulators to take decision for further investment and built necessary safeguards ensuring unlocking value of the investment thus also safeguarding consumer interest.

CER Automation of Distribution Infrastructure: Automation of distribution infrastructure may be explored through PPP models. Private investors may be allowed to invest in substation automation and related technologies which could improve standard operating procedures and operational efficiency.

The business case for such investment may be based on savings in operational cost and other measurable benefits, especially in terms of improvement in standards of performance (SoP) for which the consumer also have willingness to pay additional charge linked to SoP. The resultant sharing of savings and incentives for SoP would create a business case for private sector participation. In addition, distribution transformers may be treated as business centres, enabling targeted technological interventions and loss reduction through private sector expertise.

CER Digitalization and Smart Infrastructure: Digitalization of the power system is important, given the ongoing technological development and the need for enhancing visibility of the grid for improved performance. Digitalization initiatives involve significant investments and also pose challenges such as technological obsolescence and interoperability issues. Therefore, decisions regarding greater digitalization of the distribution segment should be based on an objective evaluation of cost–benefit analysis, institutional readiness, and stakeholder buy-in to ensure that the expected benefits of digitalization are effectively realised.

CER Advanced Technologies for Grid Stability and Creation of Distribution System Operator: Integration of distributed RE resources involves deployment of technologies such as smart inverters, vehicle-to-grid systems and advanced control mechanisms. Effective management of such distributed resources would require real-time monitoring and operational coordination at the distribution network level.

Accordingly, it is suggested that within the existing organizational structure of the distribution licensees, **the system operation function of the distribution network should be segregated and developed as a dedicated operational unit. Over time, the creation of a Distribution System Operator (DSO) may be considered,** similar to system operation arrangements in the transmission sector. Such an institutional arrangement would help improve real-time network management and enhance operational efficiency of distribution network. **DSO would also facilitate greater RE integration, demand response and introduction of retail supply competition in the sector.**

CER Undergrounding of Distribution Networks: The draft policy suggests undergrounding of distribution networks in congested urban areas to enhance reliability of supply. Undergrounding of distribution networks involves very high capital costs and its implementation may be particularly challenging due to right of way (RoW) issue in areas where integrated utility corridors and urban planning frameworks are not well developed.

Accordingly, undergrounding of distribution networks should preferably be undertaken only where it forms part of an integrated urban infrastructure planning framework such as smart city development initiatives or where reliability

²¹Brijesh Bhatt, Anoop Singh (2021), “Power Sector reforms and technology adoption in the Indian electricity distribution sector”, Energy, Elsevier, Volume 215, Part A, 15 January 2021. <https://www.sciencedirect.com/science/article/pii/S0360544220319046>

considerations justify the additional costs. **Such additional cost should not be socialised across all the consumers in the area of the distribution licensee.** Regulatory approach should be to recover such additional cost through tariff from consumers benefiting from such investment. This would also test necessary buy-in from the consumers to benefit from such initiatives.

CER Strengthening Corporate Governance of Distribution Utilities: The policy proposes strengthening corporate governance in distribution utilities through inclusion of external power sector experts on boards of distribution licensees.

The distribution utilities should ensure presence of the required number of independent directors on their board in accordance with the provisions of the Companies Act. Strengthening board-level governance would improve transparency, accountability and decision-making across the distribution utilities.

CER Universal Access to Electricity and Unwilling Households: The policy recognises that India has achieved universal electrification of willing households. However, the concept of “willing households” requires further examination to ensure that electrification statistics accurately reflect ground realities.

Accordingly, an initiative may be undertaken to identify households that 'choose' to remain unelectrified and understand the reasons for their unwillingness to take electricity connections. Such analysis would help determine whether the issue relates to affordability, service quality, or other socio-economic factors, and would enable targeted interventions to ensure inclusive access to electricity.

CER Consumer Choice in Electricity Supply and Consumer Protection: The policy emphasises offering consumers choices in electricity supply and usage. Consumer choice may be introduced through mechanisms such as retail supply competition enabled through carriage and content separation. Retail supply competition would not automatically bring benefit to the consumers unless they are **empowered to take informed decision in terms of their choice amongst the alternative tariff plans and the associated conditions.** This would require consumer empowerment through information sharing, and protection of their interest. **Strengthening of the complaint redressal and dispute resolution process** including its access and speed of resolution, and monitoring would be of paramount importance for protecting consumer interest.

CER Strengthening Consumer Grievance Redressal Mechanism: The existing consumer grievance redressal mechanism involves multiple stages including Consumer Grievance Redressal Forums (CGRF) and the Ombudsman. However, the absence of an integrated complaint tracking system makes it difficult to analyse the lifecycle of consumer complaints.

Accordingly, a unified complaint numbering system may be introduced across the state enabling tracking of complaints from CGRF to the Ombudsman level. Such a system would enable regulators to analyse complaint patterns, identify systemic issues and improve the overall grievance redressal process.

CER Framework for Defining and Reporting Quality of Supply Parameters: The draft policy proposes monitoring and publication of quality of supply parameters such as reliability indices. In case of telecom sector, the Telecom Regulatory Authority of India (TRAI) periodically publishes quality of service reports across various segment of services in the telecom sector. A unified framework (through a national portal) would not only bring transparency, empower consumers, bring accountability, and enable better compliance by the regulatory commissions.

The national-level framework should outline key definitions, measurement protocol, reporting and archiving of quality of supply parameters to ensure consistency across the country. Such standardisation would reduce definitional ambiguities and improve transparency and comparability of performance indicators across distribution utilities.

CER Monitoring Service Quality and Third-Party Verification: The policy proposes monitoring of service quality indicators and public disclosure of reliability indices. While such transparency is important, independent verification mechanisms are also necessary to ensure credibility of reported data. Telecom sector provides a credible example of adoption of third party for quality of service monitoring. Data analytics of consumer complaints would also offer insights to the quality of service.

Accordingly, third-party sampling-based quality monitoring mechanisms may be introduced to verify service quality

data reported by distribution utilities. A framework similar to the monitoring mechanism adopted by the TRAI may be considered for independent verification of service quality parameters.

CER Enhancing Consumer Participation in Regulatory Proceedings: Consumer participation in the regulatory proceedings remains limited, particularly for domestic, agricultural and small commercial consumers. While large consumers and industry associations are often able to represent their interests effectively, smaller consumers lack the resources and technical expertise to participate in the regulatory processes.

An institutional mechanism may be developed to support consumer representation in regulatory proceedings, including **creation of consumer support institutions that can analyse tariff petitions and represent consumer interests in proceedings related to generation, transmission and distribution tariffs and other regulatory matters.**

Establishment of consumer education centres or similar institutional arrangements may help support consumer participation in regulatory processes and ensure that consumer interests are adequately represented in sectoral decision-making. International experience with institutional mechanisms to safeguard consumer interest provides multiple examples across US, Australia as well as Europe. **Region/state specific institutional initiatives, supported with very small 'regulatory levy' in tariff can help support the interests of small consumers across domestic, agricultural, commercial and industrial categories.**

CER Promotion of Energy Efficient Appliances: The policy suggests that distribution licensees may support adoption of energy-efficient appliances and rooftop solar installations with storage. **Price based instruments are best suited for enabling technology adoption. This needs to be supported with conducive regulatory and policy environment. Following approach to price-based signals may be adopted to incentivise adoption of storage with behind the meter solar installations.**

- Time of Day (ToD) consumer tariffs
- Net metering regulation with ToD sensitive net metering/net billing/gross metering etc.
- Demand Response Program (Aggregator-based)

Apart from this higher PV capacity may be allowed for consumers with certain minimum proportion of storage.

Energy efficiency initiatives should be implemented in collaboration with the Bureau of Energy Efficiency through established programmes promoting energy-efficient appliances. **Based on normative energy saving potential, equivalent energy saving certificates (ESCerts) may be issued/deemed to accrue for purchase of energy efficient appliances. Monetisation of such certificates through a manufacturer led scheme can help bring down the cost of energy efficient appliances for the consumers.**

In addition, demand-side management programmes such as **smart air-conditioning technologies** capable of minor temperature adjustments during low frequency high demand periods may also be explored to manage peak loads without significantly affecting consumer comfort.

CER Separation of Distribution Network Operation (DNO) and Distribution System Operation (DSO): The experience from the unbundling of transmission functions—namely transmission network ownership, transmission system operation and planning for the interstate network—has clearly demonstrated the benefits of separating these functional areas. Such separation has improved transparency, operational neutrality and non-discriminatory access to the network.

Integration of distributed RE resources involves the deployment of technologies such as smart inverters, vehicle-to-grid systems and advanced control mechanisms. Effective management of such distributed resources requires real-time monitoring and operational coordination at the distribution network level. The evolving nature of the power sector, particularly the possible emergence of retail supply competition in the future, the presence of an independent system operator at the distribution level would become increasingly important. **An independent DSO would ensure non-discriminatory system operation, transparent grant of open access and efficient planning of distribution networks.**

As an initial step, this transition may begin through **organizational separation of DNO and DSO within the existing**

distribution utilities, including separation in terms of manpower, workflows, decision-making structures and financial accounting. **Such functional separation would lay the foundation for eventual institutional unbundling of DNO and DSO. A distribution license area may have multiple DNOs but a single DSO, thus reducing the scope of disputes in the presence of multiple distribution licensees.**

In addition, it would help clearly assign responsibility for maintaining distribution system performance standards as prescribed by the respective State or Joint Electricity Regulatory Commissions.

CER Data Accessibility from System Operators: Transparency and accessibility of operational data play a critical role in improving system operation, enabling analytical research and facilitating evidence-based policymaking in the power sector. In the context of system operation, LDCs serve as key repositories of operational data such as declared capacity, generation schedules, injection levels and other grid parameters.

While some LDCs proactively share such information through real-time dashboards and archival portals, it has been observed that several LDCs either do not make this data readily accessible or provide it in formats such as scanned images. Such formats significantly limit the usability of the data for analytical, regulatory or research purposes. **In the absence of data in the Indian context, research by researchers in India is often focussed on other countries whose data is easily available through online resources. This highlights a new kind of brain drain.**

To ensure greater transparency in grid operations and enable adoption of best international practices, the policy may encourage LDCs to share operational data in **machine-readable formats** and maintain **structured archival repositories** for historical datasets. **Such data may also be released with a delay of 1-2 days to address any concerns about its inappropriate use.**

Improved accessibility of grid operational data would enable regulators, policymakers, researchers and other stakeholders to undertake meaningful analysis, improve forecasting methodologies and enhance overall efficiency and reliability of the power system.

CER Need for Structured Data Governance in the Power Sector: With increasing digitalisation of the electricity sector, large volumes of data are generated across various stages of the electricity value chain. This includes data related to generation, transmission operations, distribution networks, consumer usage patterns and system planning activities. However, the **absence of a comprehensive data governance framework often results in inconsistencies in data definitions, formats and reporting practices across sector entities.**

The policy may therefore consider introducing a **dedicated data governance framework for the power sector**, covering the entire data lifecycle including generation, measurement, processing, storage, retrieval and utilisation. Standardised definitions, reporting templates and data formats would significantly improve data reliability and comparability across institutions.

Improved access to high-quality datasets would also support analytical research and policy development. Currently, many researchers in India working on technical, operational and economic aspects of the power sector often rely on international datasets or outdated domestic data due to limited access to current operational data across the electricity supply chain.

Enhancing transparency and structured access to datasets would strengthen analytical capability within the country and support evidence-based decision-making for regulators, utilities and policymakers.

CER Facilitating Data Sharing Across Power Sector Institutions: Despite the availability of large volumes of operational data within the power sector, several entities remain reluctant to share such data due to concerns related to regulatory clarity, legal liabilities and operational constraints. In many cases, utilities cite lack of clear protocols for data sharing, absence of manpower for data retrieval, or concerns that increased transparency may expose operational inefficiencies.

To address these challenges, the policy may encourage the development of **standardised protocols for data sharing across the power sector, including a common Non-Disclosure Agreement (NDA) framework.** Such a standardised NDA template could be developed in consultation with sector stakeholders including utilities, regulators, consultants, academic institutions and legal experts.

The availability of a common NDA framework would enable utilities to share data with researchers and other stakeholders while ensuring appropriate safeguards for confidentiality and data security.

CER Strengthening Cybersecurity Protocols for Power Sector Infrastructure: With increasing digitalisation and integration of information technology systems into power sector operations, cybersecurity has become a critical concern for system operators and utilities. In particular, the distribution network and system operation infrastructure are increasingly dependent on communication systems, digital control technologies and data networks.

The cybersecurity preparedness of power sector entities, especially the distribution utilities, remains weak/uneven. The absence of standardised protocols and compliance mechanisms may expose critical power sector infrastructure to cyber risks.

The policy may therefore encourage the development of **standard cybersecurity protocols for the power sector**, including clearly defined compliance requirements and reporting frameworks. These protocols may be developed by the Central Electricity Authority in consultation with relevant stakeholders, including power utilities, cybersecurity agencies and technical experts.

The framework may include periodic compliance reporting, clear institutional responsibilities and mechanisms for timely reporting of cybersecurity incidents. Establishing structured cybersecurity governance would help improve resilience of power system infrastructure and ensure secure operation of increasingly digitalised power networks.

CER Improving System Visibility of Emerging Distributed Resources: The rapid growth of distributed energy resources such as rooftop solar and electric vehicle charging infrastructure is expected to significantly influence electricity demand patterns and distribution network operation. However, obtaining real-time visibility of all distributed resources may not be practically feasible and cost effective due to the large number of small installations distributed across the licensee area.

A more practical approach may involve capturing operational data for larger installations while aggregating information from smaller resources on sampling basis. At the same time, operational data generated by smart meters, inverters and charging infrastructure should be **archived within the country** and made accessible for system planning purposes.

Due to rising energy security concerns, electric vehicle charging demand is expected to become an important component of electricity consumption in the future. Encouraging **separate metering for electric vehicle charging (except 2 wheelers)**, could provide valuable data for forecasting demand growth and planning distribution network upgrades.

Such visibility would also enable future integration of electric vehicles into **vehicle-to-grid (V2G) and grid-to-vehicle services**, thereby supporting demand response and providing flexibility resources to the power system.

CER Collaborative Approach for Sectoral R&D Initiatives: The policy proposes that power utilities earmark financial resources for research and development activities. However, many distribution utilities face significant operational and financial constraints, which may limit their ability to independently undertake large and multiple research initiatives.

A more effective approach may involve **collaborative R&D initiatives involving multiple utilities, generators, system operators and academic institutions. Joint research programmes would allow participating entities to pool financial resources, technical expertise and operational experience.**

Such collaborative efforts would also enable testing of innovative solutions across multiple operating environments. For instance, demand response mechanisms, digital tools for distribution system planning or advanced forecasting models could be piloted across different states, generating valuable insights and practical use cases.

CER Balanced Approach to Domestic Manufacturing and Technology Deployment: Promoting domestic manufacturing and technology development in the power sector is important for strengthening energy security and reducing dependence on external supply chains. Initiatives such as domestic equipment manufacturing and technology development can support long-term self-reliance in critical power sector technologies.

At the same time, it is important that such initiatives are implemented within a **competitive ecosystem** that ensures

cost efficiency and technological innovation. Excessive protection without sunset clause may lead to higher costs for utilities and ultimately for electricity consumers.

The policy may therefore consider adopting a **graduated or time-bound approach with sunset policy to promote domestic technology/manufacturing**, where domestic manufacturers receive initial support while gradually achieving competitiveness in open markets. Such an approach would encourage technology development while maintaining efficiency in procurement decisions.

CER Strengthening Regulatory and Institutional Governance: The policy emphasises technological and structural reforms across the power sector but provides relatively limited attention to strengthening institutional governance frameworks. Effective implementation of sector reforms requires **strong regulatory institutions and well-trained personnel across utilities, system operators and regulatory commissions**.

In particular, there is a need to enhance professional capacity within institutions such as load dispatch centres, distribution utilities and regulatory bodies. **There is an urgent need to increase the sanctioned strength of employees, particularly for key techno-commercial regulatory functions across the electricity sector especially the regulatory commissions and the load despatch centres.** The policy may therefore encourage the development of structured **capacity-building programmes and professional training frameworks** for personnel involved in system operation, regulatory oversight and sector planning.

Establishing dedicated professional cadres for key operational roles, including load dispatchers and regulatory professionals, may significantly strengthen institutional capacity and improve governance within the sector.

Enhanced institutional capacity would also improve monitoring of compliance, implementation of regulatory frameworks and adoption of modern operational practices necessary for managing a rapidly evolving electricity system. **Strengthening institutional capacity would therefore play a critical role in ensuring that technological and regulatory reforms in the power sector are implemented effectively.**

CER Optimising Financing Cost for Power Sector Entities: The power sector requires substantial financial investments to support network expansion, RE integration, digitalisation and infrastructure modernisation. However, the availability and cost of financing remain significant constraints for many utilities, particularly state-owned generation, transmission and distribution companies.

The policy should therefore encourage utilities to adopt **competitive and diversified borrowing strategies**, enabling them to access financing at lower interest rates where feasible. In several cases, private sector utilities have demonstrated the ability to access debt at rates close to sovereign borrowing levels, whereas many state government owned utilities continue to incur significantly higher borrowing costs.

Optimising the cost of borrowing for original debt or its restructuring later can substantially reduce the overall cost of infrastructure investments and ultimately lower electricity tariffs for consumers. Encouraging greater financial discipline and competitive financing mechanisms would therefore strengthen the financial sustainability of the power sector.

CER Exploring Green Finance and New Financial Instruments: The scale of investment required for modernising the power sector and supporting the energy transition necessitates the exploration of innovative financing mechanisms beyond conventional lending structures. Traditional project financing may not always be sufficient to support emerging technologies and infrastructure projects associated with renewable integration and grid modernisation.

In the above context, the policy may consider promoting use of **innovative financing structures such as green finance instruments, climate finance mechanisms and contract-for-difference (CFD) based frameworks**. Such instruments could help reduce financing risks for investors while supporting the development of new technologies and infrastructure required for the evolving electricity system.

Green finance mechanisms may also facilitate access to international capital markets, enabling utilities to raise funds for projects that contribute to decarbonisation and sustainability objectives. Successful implementation of such mechanisms would require clear regulatory frameworks, transparent financial reporting and improved financial discipline within sector entities. Strengthening the financial governance of utilities will therefore remain an essential

prerequisite for attracting long-term investment into the power sector.

CER Enhancing Resilience of Electricity Networks to Climate Events: Extreme weather events such as floods, storms and cyclones increasingly pose risks to electricity infrastructure across various parts of the country. In several regions, particularly in river basins and coastal areas, distribution networks have experienced significant damage during such events, affecting power supply reliability and increasing repair costs.

While the policy discusses broader climate adaptation measures, the resilience of electricity infrastructure itself requires greater attention. Distribution networks are particularly vulnerable due to their extensive geographic spread and exposure to environmental conditions.

The policy may therefore encourage utilities to incorporate **climate resilience considerations in network planning and infrastructure design**, including adoption of technologies and construction practices that reduce vulnerability to extreme weather events. Improving resilience of distribution infrastructure would not only reduce the economic impact of infrastructure damage but also enhance reliability of electricity supply during emergency situations. Strengthening the resilience of power networks will therefore become increasingly important in the context of evolving climate risks.

CER Leveraging Data for Analytical Decision-Making: The increasing availability of operational data within the power sector creates significant opportunities for advanced analytics, forecasting and optimisation of system operations. However, **the lack of structured access to high-quality datasets has limited the development of a robust analytics ecosystem and research within the sector.**

The policy may therefore encourage the development of a **data analytics ecosystem**, enabling researchers, utilities and policymakers to utilise available datasets for system modelling, demand forecasting, operational optimisation and policy analysis. Such an ecosystem would support development of analytical tools tailored to the Indian system conditions and help improve evidence-based decision-making across the sector.

Improved access to data would also enable independent research institutions and academic organisations to contribute to solving operational and planning challenges faced by utilities. Over time, such collaborative efforts could significantly enhance the analytical capabilities of the power sector and support the development of innovative solutions for managing complex electricity systems.

CER Promoting Energy Efficiency and Waste-to-Energy Initiatives: Energy efficiency and demand-side measures play an important role in improving overall system efficiency and reducing the need for additional generation capacity. However, many energy efficiency initiatives fall outside the direct operational domain of electricity utilities and therefore require coordination across multiple sectors and institutions.

For instance, initiatives related to **waste-to-energy, urban waste management and energy recovery systems** often involve municipal authorities, environmental agencies and urban development institutions in addition to power sector entities. The policy may therefore encourage coordinated approaches involving relevant stakeholders to implement such initiatives effectively. Financing mechanisms, including innovative financial structures and green finance instruments, may also be considered to support these projects.

While such initiatives can contribute to improved energy efficiency and resource utilisation, their successful implementation will depend on clear institutional responsibilities, coordination between sectoral agencies and availability of appropriate financial support mechanisms.

CER Integrated Approach for Agricultural Energy Efficiency: Energy efficiency in electricity utilisation, particularly in the agriculture sector, is a critical component of overall system efficiency. While existing programmes such as feeder solarisation and pump efficiency improvement address specific aspects, their implementation has remained fragmented and difficult to scale.

A more integrated approach may be considered, wherein new agricultural electricity connections are provided through an **Energy Service Company (ESCO)**-based model, combining efficient pump sets with embedded solar PV systems (Agri-PV). Under such a framework, **the ESCO would be responsible for investment, operation and maintenance of both the pump and solar system, with performance linked to actual energy utilisation**

measured through AMI-enabled smart metering.

In addition, an alternative architecture based on a microgrid approach may be explored, wherein a centralised solar PV plant (of the order of 500 kW to 1 MW) serves a cluster of farmers. This may be configured either with decentralised pumps or with both generation and pumping infrastructure centralised. In such a model, the operating entity may supply **water-as-a-service**, rather than electricity supply. This approach may offer greater acceptance among farmers, as electricity is often perceived as an intermediate input, whereas water represents a tangible and directly valued output. Accordingly, monetisation through water supply may provide a more effective and scalable business model.

The system may further incorporate GPS-based tagging and QR code-based identification of PV systems and pumps to enable transparent monitoring of deployment, operation and maintenance.

CER Mandating Efficiency in Public Procurement and Clarifying Policy Scope: Energy efficiency improvements in appliances have been widely implemented through market mechanisms and voluntary adoption. However, large-scale impact may be achieved by leveraging government procurement as a policy tool.

The policy may consider mandating that **all government procurement of electrical appliances meets minimum energy efficiency standards**, such as a specified star rating under the applicable labelling programme. Such a requirement would ensure that public sector demand drives market transformation, encouraging manufacturers to prioritise higher efficiency products.

At the same time, care may be taken to ensure alignment of policy provisions with the appropriate legislative framework. **Certain elements such as carbon trading mechanisms originate from the Energy Conservation Act and may not fall directly within the scope of the Electricity Act under which the policy is framed.** Accordingly, while such mechanisms may be acknowledged, their inclusion within the policy may be clarified to ensure consistency with legislative mandates. **Clear delineation of institutional responsibilities across different legal frameworks would improve policy coherence and avoid potential overlaps or ambiguities in implementation.**

CER Lifecycle Assessment and Competitive Framework for Waste-to-Energy: The utilisation of municipal solid waste and agricultural residues for energy generation requires careful evaluation. Such initiatives should be undertaken based on **lifecycle techno-economic assessment**, rather than solely on indicative benefits, to ensure that they deliver genuine environmental and economic value.

Further, projects involving waste-to-energy or biomass utilisation should be implemented through **competitive bidding mechanisms**, with clearly defined performance benchmarks. Regulatory frameworks may also ensure that tariff determination is linked to actual compliance with prescribed waste processing standards, such as pelletisation. In the absence of such monitoring, there is a risk that inferior practices such as open burning may persist while still receiving tariff support.

From a financing perspective, **development of high-cost and emerging technologies such as that for WTE plants may require innovative approaches such as Contract-for-Difference (CFD) frameworks**, supported by appropriate budgetary provisions. Green financing may also be encouraged for distribution utilities, particularly for initiatives related to renewable integration, distributed energy resources and rooftop solar programmes.

Such targeted financial mechanisms would enable adoption of advanced technologies while ensuring cost-effectiveness and risk mitigation.

CER Capacity-Based Storage Procurement and Amendment to Competitive Bidding Guidelines: In the proposed Clause 6(6), *“Incentives, Procurement, and Regulation,”* it is stated that *“To accelerate ESS deployment, Appropriate Commission should promote colocated battery storage with variable renewable energy projects. Grid operators may be assigned ESS for ancillary service management. Besides long-term PPAs, the Central Government will promote ESS development through market-based mechanisms including bilateral contract settlement. The Central Commission must establish required regulatory framework to implement bilateral contract settlement based capacity procurement.”*

It is proposed to additionally include the following text: *“The Central Commission must establish required regulatory framework to implement bilateral contract settlement based **storage** capacity procurement. **The Central***

Government may amend the competitive bidding guidelines, to put this into effect.”

The proposed insertion explicitly enabling bilateral contract settlement based storage capacity procurement and corresponding amendment of competitive bidding guidelines is a significant regulatory development. **Capacity-based procurement of Energy Storage Systems (ESS) represents a long-term financial commitment and must therefore be carefully aligned with identified system needs.** In absence of clearly defined accreditation norms, performance standards, and linkage with Resource Adequacy planning, such procurement may result in excess capacity creation and additional financial burden on consumers. Accordingly, it is suggested that while incorporating the proposed text, it may be clarified that **storage capacity procurement through bilateral contract settlement shall be undertaken based on approved Resource Adequacy Plans, with clearly defined availability obligations, performance parameters, and transparent competitive bidding processes to ensure cost-effectiveness and system reliability.**



Regulatory Lexicon

UERC Concept Paper on TOD Tariff for Solar and Non-Solar Hours

Time of Day (ToD) Tariff

The Government of India has introduced two key updates to the existing power tariff system through amendments to the Electricity (Rights of Consumers) Rules, 2020, including the introduction of ToD tariffs and the simplification of smart meter rules. Further clarity on ToD tariffs was provided in the Electricity (Rights of Consumers) Amendment Rules, 2023, which explain that electricity pricing will vary based on the time of usage. As per these rules, ToD tariffs are to be implemented for Commercial and Industrial (C&I) consumers with a maximum demand above 10 kW by 1st April 2024, and for all other consumers (except agricultural) by 1st April 2025. Additionally, if a consumer already has a smart meter installed, the ToD tariff will be applicable immediately after installation.

Key Pricing Rules

- During peak hours, electricity will be costlier: at least 20% higher for C&I consumers and 10% higher for other consumers.
- During solar hours, electricity will be at least 20% cheaper than the normal tariff
- These extra charges (surcharge) and discounts (rebate) will apply only to the energy charge part of the bill, not the entire tariff.
- The duration of peak hours cannot exceed the solar hours defined by the State Commission or Load Dispatch Centre.

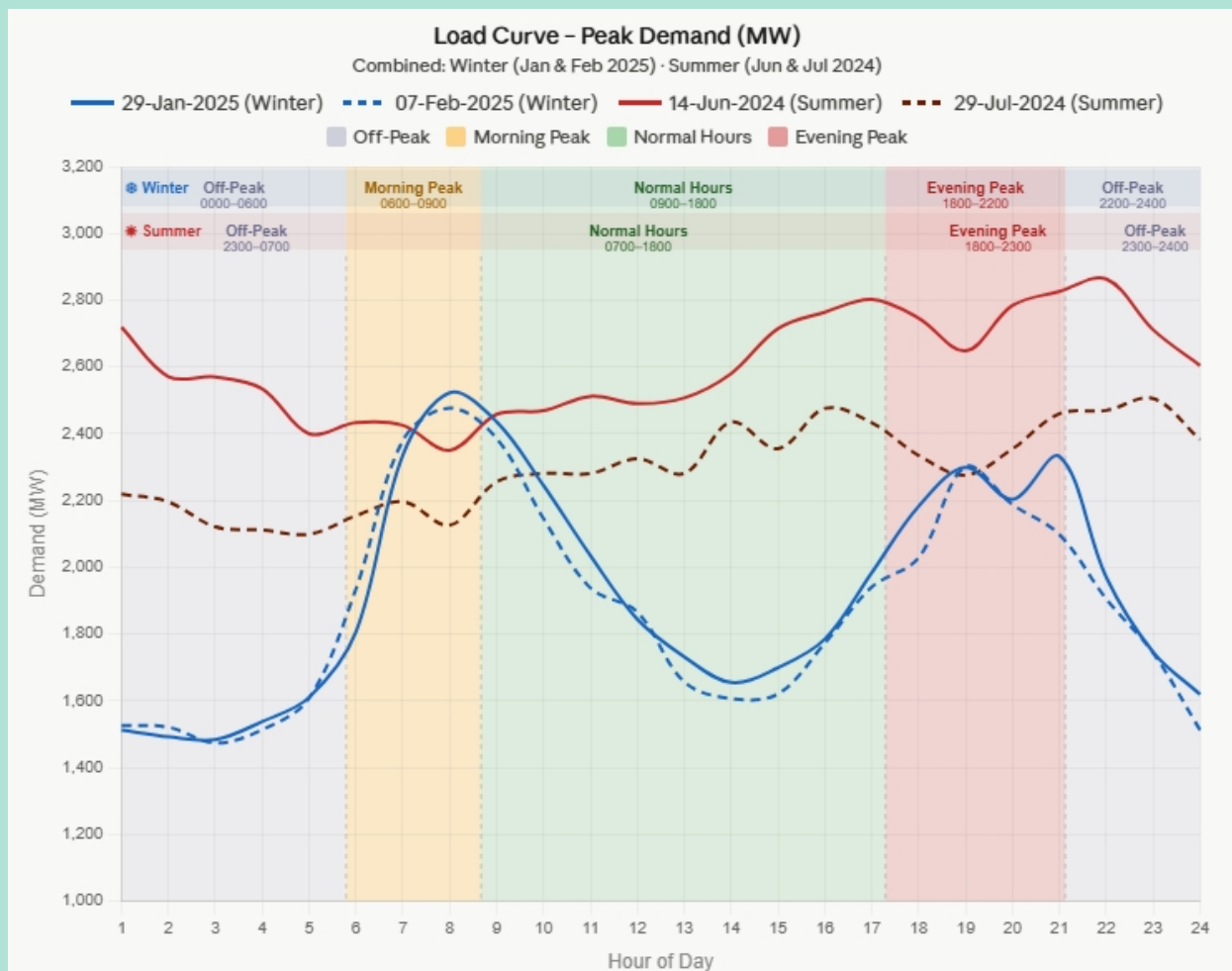


Figure 3: Load Curve of Peak and Off-Peak Hours

The purpose of ToD tariff is to align electricity prices with how demand and supply change throughout the day. During daytime, when solar power is easily available and cheaper, electricity rates are kept lower to encourage people to use more power at that time. On the other hand, during peak hours when demand is high, prices are increased to discourage excessive usage. This approach helps in balancing the load on the grid, making better use of renewable energy sources, and reducing stress on power infrastructure.

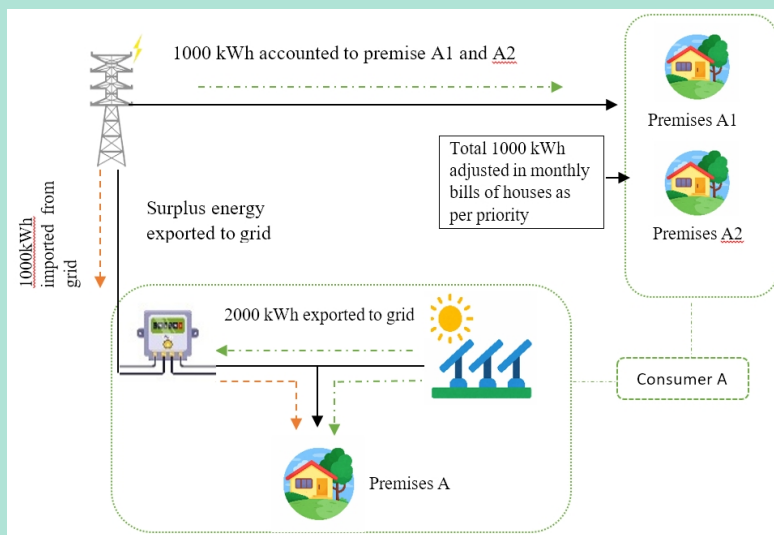
MSERC Draft on (Grid Interactive Distributed Renewable Energy Sources) Regulations 2026

Group Net Metering (GNM): Group Net Metering is meant for a single consumer who has multiple electricity connections at different locations within the same distribution area. It allows the consumer to install a renewable energy (RE) plant at any one location where space (roof or land) is available.

In GNM, the way electricity is shared is slightly different. The power generated is first adjusted (netted) at the location where the RE plant is installed. If there is any extra electricity left, it is then distributed to the consumer's other premises based on pre-decided priorities. Each location can use its share to offset its own electricity consumption.

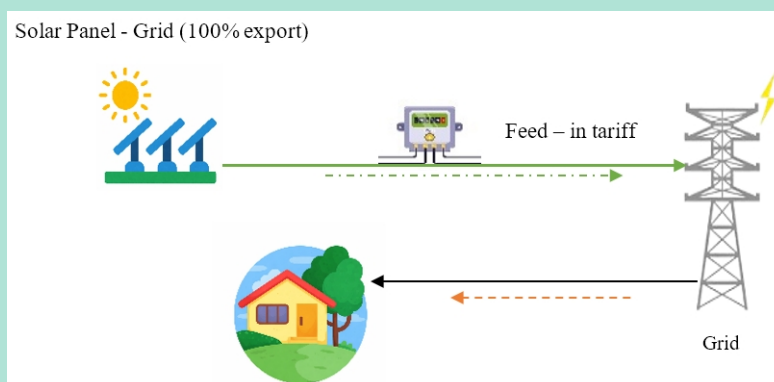
If the total renewable energy generated is more than the combined consumption of all the connections, then the remaining units are handled as per the state's net metering rules and regulations.

This setup has two main benefits. First, it helps the consumer make maximum use of renewable energy from a single plant. Second, like Virtual Net Metering, it solves the problem of limited space at different premises while still allowing the consumer to enjoy the benefits of net metering.



Gross Metering (GM): Gross metering is a system where all the electricity generated from a solar plant is sent directly to the grid. The consumer is paid for this energy at a fixed rate called the feed-in tariff, which is measured using a separate (unidirectional) meter.

At the same time, the consumer buys electricity from the grid for their own use and pays for it at the regular retail tariff set by the discom.

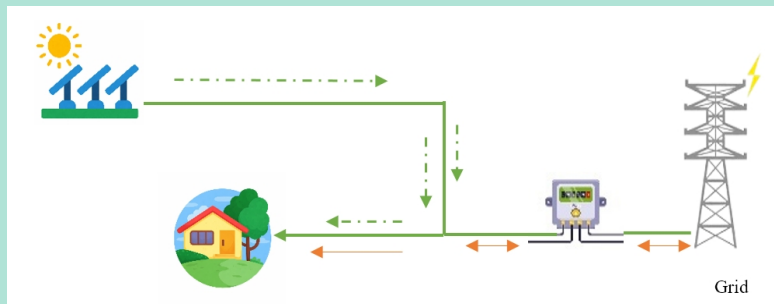


Usually, the rate at which electricity is sold to the grid (feed-in tariff) and the rate at which electricity is purchased from the grid (retail tariff) are different.

Net Metering: Net metering is a system where the electricity you generate (like from solar panels) is adjusted against the electricity you use from the grid, which helps reduce your electricity bill. In simple terms, the energy you produce is subtracted from your total consumption over a certain period.

This adjustment can be done monthly, half-yearly, or yearly, depending on the rules. A bidirectional (net) meter is used to record both the electricity you take from the grid and the electricity you send back.

If you generate more electricity than you consume, the extra units may or may not be paid for, depending on your state's net metering policy.

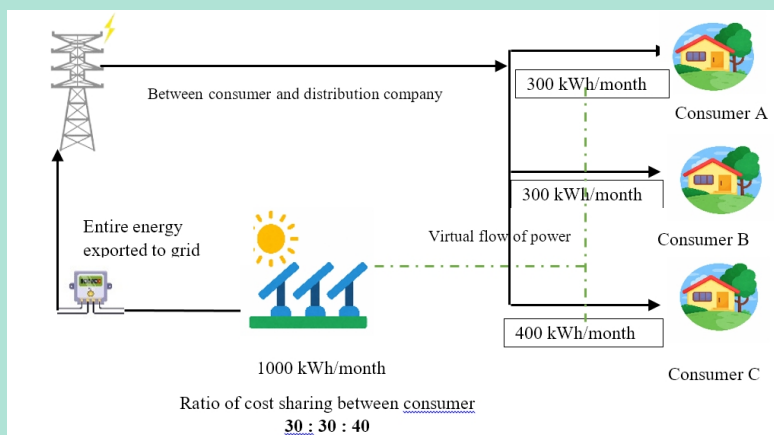


Virtual Net Metering (VNM): Virtual Net Metering (VNM) allows a group of consumers within the same electricity distribution area to set up a shared renewable energy (RE) plant at a common location.

In this system, the electricity generated by the shared RE plant is fed into the grid. The total energy generated is then divided among the participating consumers based on how much each one has invested in the project.

Each consumer can use their allocated share of energy to reduce their electricity bill. If the total RE generation is more than the combined consumption, the extra units are adjusted according to the state's net metering rules and regulations.

This arrangement has two main advantages. First, it helps reduce costs because consumers can benefit from economies of scale by investing together. Second, it solves the problem of limited space, since the plant does not need to be installed at each consumer's premises.



MoP Draft on National Electricity Policy (Amendment) Bill, 2026-Reg

Demand Side Management (DSM)

DSM refers to a set of planned interventions aimed at influencing consumer electricity consumption patterns in order to improve system efficiency, reduce peak demand, and optimize overall energy usage. In the Draft NEP 2026, DSM is positioned as a critical pillar for managing demand growth in a system with increasing penetration of variable renewable energy. It encompasses mechanisms such as energy efficiency improvements, demand response programs, smart metering, and enhanced consumer participation, all of which aim to shift the system from a supply-driven paradigm to one that

actively manages demand. In effect, DSM evolves from a narrow focus on energy savings to a broader framework that integrates efficiency, flexibility, and consumer responsiveness. This makes it a crucial enabler for reducing system costs, minimizing infrastructure expansion requirements, and facilitating higher renewable energy integration, while transforming consumers into active participants in power system operation.

A key extension of DSM highlighted in this context is demand flexibility, which refers to the ability of consumers to adjust their consumption in response to system conditions, price signals, or grid requirements. Instruments such as Time-of-Use (ToU) tariffs play a central role in enabling this flexibility by varying electricity prices across different time blocks, thereby incentivizing consumers to shift usage away from peak periods. Together, demand flexibility and ToU tariffs allow the system to better align demand with the availability of renewable generation, reduce reliance on expensive peak power, and improve overall grid stability.

Peer-to-Peer (P2P) Energy Trading

Peer-to-Peer (P2P) energy trading refers to a decentralized electricity transaction mechanism wherein consumers and prosumers—typically rooftop solar owners—can directly buy and sell electricity among themselves through a digital platform, while continuing to use the existing distribution network. In the Indian context, pilot implementations (e.g., by Paschimanchal Vidyut Vitran Nigam Limited) demonstrate that P2P trading operates through smart meters, digital interfaces, and utility-facilitated settlement systems, with DISCOMs retaining responsibility for network operation, metering validation, and billing. While the physical flow of electricity remains unchanged, a virtual trading layer enables transparent energy transactions.

Within the Draft NEP 2026, P2P trading is positioned as part of the transition towards consumer-centric and decentralized energy systems, supported by digital infrastructure such as the India Energy Stack. It has the potential to improve distributed renewable utilization, reduce curtailment, and enable localized market-based price discovery.

Key Features and Considerations:

- **Decentralized Market Mechanism:** Direct transactions between consumers and prosumers over digital platforms.
- **Utility as Facilitator:** DISCOMs manage network access, settlement, and grid reliability.
- **Digital Enablement:** Requires smart metering, secure data exchange, and platform-based transactions.
- **System Efficiency Gains:** Enhances utilization of distributed RE and supports localized price discovery.

India Energy Stack (IES)

IES refers to a Digital Public Infrastructure (DPI) conceptualised by the Ministry of Power to create a unified, secure, and interoperable digital foundation for the power sector, enabling seamless interaction across all stakeholders in the electricity value chain. It is designed to act as a common digital layer, similar to UPI in the financial sector, through which utilities, generators, market operators, distributed energy resources (such as rooftop solar and batteries), electric vehicle charging infrastructure, and consumers can exchange data and services in a standardized and trusted manner. By providing unique identifiers for consumers and assets, enabling consent-based real-time data sharing, and supporting open APIs, the IES seeks to overcome the current fragmentation of systems and facilitate integrated, data-driven decision-making across the sector.

In the evolving context of increasing RE penetration, electrification of mobility, and rising consumer participation in energy markets, IES is envisaged as a critical enabler of innovation and operational efficiency. It supports applications such as peer-to-peer energy trading, demand response, EV charging integration, and advanced analytics through platforms like the proposed Utility Intelligence Platform (UIP). By creating shared digital “rails” for energy data and transactions, IES aims to enhance DISCOM efficiency, improve grid management, and empower consumers with greater visibility and control over their energy usage. Its successful implementation will depend on robust data governance frameworks, cybersecurity protocols, and coordinated institutional efforts to ensure secure, scalable, and equitable access to digital energy services across the country.

Cloud Energy Storage (CES)

CES refers to an aggregated, shared, and service-oriented model of utilizing energy storage systems, wherein users do not own physical storage assets but instead access storage capacity virtually through a centralized platform. Inspired by the sharing economy, CES enables multiple users, across generation, grid, and demand segments, to utilize pooled storage

resources (centralized or distributed) on an on-demand basis, paying only for the services consumed. This model improves utilization efficiency by aggregating diverse storage assets and matching them with complementary demand profiles, thereby reducing idle capacity and lowering overall system costs. CES leverages coordinated control, economies of scale, and demand aggregation to enhance both technical performance and economic viability of storage deployment.

Within the context of the Draft NEP 2026, CES aligns closely with India's transition towards a flexible, digitalized, and renewable-intensive power system. With increasing penetration of variable RE, the need for flexible resources such as storage is growing rapidly; however, high capital costs remain a key barrier. CES provides a mechanism to overcome this by converting storage from a capital-intensive asset into a service-based model, thereby enabling wider participation, including DISCOMs, renewable generators, and consumers. It also complements emerging frameworks such as distributed energy resources, peer-to-peer markets, and digital platforms like the India Energy Stack, which can facilitate real-time coordination, data exchange, and market-based transactions.

In the Indian power sector, CES can play a critical role across multiple layers: enabling renewable integration (by providing balancing and curtailment reduction), supporting grid operations (through ancillary services like frequency regulation and peak shaving), and empowering consumers (through cost optimization and demand flexibility).

Distribution System Operator (DSO)

A Distribution System Operator (DSO) refers to an entity responsible for real-time operation, monitoring, and management of the distribution network, including integration of distributed energy resources (DERs) such as rooftop solar, storage, and electric vehicles. Under the Draft NEP 2026, DSOs are envisaged at the DISCOM level to enable advanced grid management and support the transition towards a decentralized and dynamic power system.

The concept reflects a structural shift in the distribution sector—from DISCOMs acting as passive suppliers to active system operators managing bidirectional power flows and enabling future market mechanisms.

Key Aspects:

- **Real-Time Grid Management:** Operation, monitoring, and control of distribution networks with high DER penetration.
- **DER & Demand Integration:** Facilitates integration of rooftop solar, storage, EVs, and demand response.
- **Enabler of Market Evolution:** Supports retail competition, P2P trading, and decentralized energy markets.
- **Institutional Transformation:** Requires separation of network and supply roles, with enhanced regulatory and operational frameworks.

Carbon Credit Trading Scheme (CCTS)

The Carbon Credit Trading Scheme (CCTS) is India's emerging compliance carbon market framework, established through the amendment to the Energy Conservation Act, 2001. It provides the legal basis for issuance and trading of Carbon Credit Certificates (CCCs), where covered entities, primarily energy-intensive industries—are assigned emission intensity targets (tCO₂ e per unit of output). Entities outperforming targets earn CCCs, while those underperforming must purchase and surrender them. The scheme follows an intensity-based baseline-and-credit mechanism, building upon the Perform, Achieve and Trade (PAT) framework.

In the context of Draft NEP 2026, the CCTS serves as a critical instrument for aligning the power and industrial sectors with India's climate commitments, including NDC targets and net-zero goals. While originating outside the Electricity Act framework, its interaction with power markets, dispatch decisions, and renewable integration makes it highly relevant. The scheme can enable cost-effective decarbonisation through market-based signals, but its effectiveness depends on robust MRV systems, transparent market design, and institutional coordination.

Key Features:

- **Market-Based Emission Control:** Intensity-based baseline-and-credit system with CCC trading.
- **Institutional Framework:** Led by BEE, overseen by NSCICM, with trading regulated by CERC via power exchanges.
- **Alignment with Climate Targets:** Supports NDC goals (45% emission intensity reduction by 2030; net-zero by 2070).
- **Integration with Power Sector:** Influences dispatch, renewable integration, and market operations.

- **Implementation Challenges:** Requires strong MRV systems, data transparency, and coordination across regulatory bodies.

Transparent Monitoring and Performance Standards

Transparent Monitoring and Performance Standards refer to the establishment of measurable, verifiable, and publicly accessible benchmarks to evaluate the performance of power sector utilities—particularly in distribution and system operations. These standards are essential for ensuring accountability, regulatory oversight, and consumer-centric service delivery, and are typically enforced by Regulatory Commissions through defined metrics, reporting protocols, and penalty/compensation mechanisms. In the context of the Draft NEP 2026, such standards are closely linked with improved data transparency, real-time monitoring, and the adoption of best operational practices across utilities and load dispatch centres. Transparent performance frameworks enable evidence-based regulation, facilitate benchmarking across utilities, and support informed decision-making by policymakers, regulators, and consumers.

A key component of these standards is the use of reliability indices, which quantify the quality and continuity of electricity supply. The most widely used indices include:

- **System Average Interruption Duration Index (SAIDI):** Measures the average total duration of power outages experienced by a consumer over a period (typically hours/year).
- **System Average Interruption Frequency Index (SAIFI):** Measures the average number of interruptions experienced by a consumer over a period (interruptions/year).
- **Customer Average Interruption Duration Index (CAIDI):** Represents the average duration of each outage, calculated as SAIDI divided by SAIFI (hours/interruption).

Together, these indices provide a comprehensive picture of supply reliability, SAIFI captures how often outages occur, SAIDI reflects the overall impact on consumers, and CAIDI indicates how quickly the system is restored after a fault.

In the Indian context, integration of such indices within a transparent monitoring framework, supported by machine-readable data, standardized reporting formats, and digital platforms, can significantly improve regulatory effectiveness. It also aligns with broader reforms aimed at enhancing data governance, enabling analytics, and ensuring that performance outcomes are visible not only to regulators but also to consumers and the research community.



Regulatory Updates

Tariff



CERC approved the petition filed by Power Grid Corporation of India Limited seeking truing-up of transmission tariff for the FY 2019–20 to FY 2023-24 tariff period and determination of transmission tariff for the FY 2019–20 to FY 2023-24

period for the Combined Asset under the “System Strengthening in Southern Region–XIV” project. After prudence check, the Commission allowed additional capitalization of ₹3007.91 lakh and approved the revised capital cost and tariff for the applicable tariff periods.



HPERC approved the capital cost and determined the transmission tariff for the 220/66 kV, 100/126 MVA GIS Sub-Station at Gumma developed by Himachal Pradesh Power Transmission Corporation Limited. The petitioner filed

the petition seeking approval of the project’s capital cost and tariff from the date of commercial operation to FY 2028-29 under the applicable transmission tariff regulations. After prudence check of project cost, funding, time overrun, and stakeholder submissions, the Commission approved the admissible capital cost and corresponding Aggregate Revenue Requirement and transmission charges for the applicable control periods.



KSERC in its Order dated 3rd January 2026, approved the Truing Up of Accounts for Infopark, Kochi, for the financial year 2024–25, recording an actual revenue gap of ₹79.76 lakh compared to the initially approved

revenue surplus of ₹13.15 lakh. The Commission validated the total expenditure for the year at ₹1342.08 lakh against a total realized revenue of ₹1262.32 lakh, which included ₹1187.62 lakh from power sales, ₹64.46 lakh from wheeling charges for 102.75 lakh units of energy, and ₹10.24 lakh from non-tariff income. Operational data revealed that the licensee served 217 consumers with total energy sales of 137.61 lakh units, while achieving an overall distribution loss of 2.86%, which is significantly better than the regulatory norm of 4.23%. Regarding expenses, the Commission scrutinized the power purchase cost of ₹1023.94 lakh and the reported O&M expenses of ₹98.22 lakh—which exceeded the regulated norm of ₹56.56 lakh—and admitted a depreciation claim of ₹47.21 lakh in accordance with the Tariff Regulations, 2021.



PSERC allowed the petition filed by M/s A.B. Sugars Limited seeking clarification on the tariff applicable for import of

power from PSPCL during crushing and non-crushing seasons and challenging PSPCL’s demand notice dated 6th November 2024. The petitioner approached the Commission alleging incorrect billing by PSPCL at the higher of LS tariff or PPA sale rate throughout the year. The Commission held that the higher-of-two tariff provision under Clause 2.2.1 of the PPA applies only during the crushing season and directed PSPCL to revise billing accordingly.



RERC approved reviewed the tariff for the 500 MW/2000 MWh Battery Energy Storage System (BESS) project in Rajasthan was discovered through a fair and transparent competitive bidding process as per Section 63 of the Electricity Act, 2003. The discovered tariff of ₹2,85,000/MW/month is among the lowest compared to similar BESS projects in India, indicating it is reasonable and aligned with current market trends the project is justified as it supports grid stability, renewable energy integration, and meets the Energy Storage Obligation targets under RERC Regulations, 2023.

Power Procurement



HPERC approved the joint petition filed by HP State Electricity Board Limited and Krishna Energy Solar Power Project seeking approval of a Power Purchase Agreement for a 1 MW solar PV project in District Kangra. The petitioners approached the Commission to obtain regulatory approval for the PPA in accordance with the Swaran Jayanti Solar Farm Policy and applicable renewable energy regulations. The Commission approved the PPA and allowed a tariff of ₹3.45/kWh applicable to rural solar projects up to 1 MW, subject to adjustment of any subsidy received.

HPERC approved the joint petition filed by HP State Electricity Board Limited and New Noorpur Surya Urja Solar Power Project seeking approval of a Power Purchase Agreement for a 1 MW solar PV project in District Kangra. The petitioners approached the Commission to obtain regulatory approval for the PPA in accordance with the Swaran Jayanti Solar Farm Policy and applicable renewable energy regulations. The Commission approved the PPA and allowed a tariff of ₹3.45/kWh applicable to rural solar projects up to 1 MW, subject to adjustment of any subsidy received.

Regulatory Updates



KSERC after examining the petition filed by M/s Thrissur Corporation Electricity Department (TCED), has approved the Power Purchase Agreement (PPA) dated 1st January 2025 executed between TCED and Kerala State Electricity Board

Limited for procurement of 45 MVA of power to meet the electricity demand within the licensed area of TCED, in accordance with the provisions of the Electricity Act, 2003 and the KSERC (Terms and Conditions of Determination of Tariff) Regulations, 2021, and has further directed that a copy of the duly signed PPA be submitted to the Commission for information and record.



MERC approved the petition filed by Maharashtra State Electricity Distribution Company Limited seeking approval to initiate a competitive bidding process for procurement of 2269 MW distributed solar power under the

Mukhyamantri Saur Krushi Vahini Yojana (MSKVY) 2.0 scheme. The petitioner approached the Commission to address the shortfall in previously approved solar procurement and accelerate feeder-level solarisation for agricultural consumers. The Commission permitted MSEDCL to proceed with the bidding process with proposed deviations in the bidding documents, including delinking Central Financial Assistance and specifying a ceiling tariff of ₹2.90/kWh.

MERC approved the petition filed by Maharashtra State Electricity Distribution Company Limited seeking adoption of tariff and approval of the Power Sale Agreement with Solar Energy Corporation of India for procurement of 700 MW solar power under the ISTS Solar Tranche-XIII scheme. The petitioner approached the Commission to procure renewable energy to meet its Renewable Purchase Obligation targets and future demand requirements. After examining the competitive bidding process and tariff adopted by CERC, the Commission approved procurement at ₹2.63/kWh, including trading margin, for a period of 25 years.



MPERC examined Fly Ash transportation expenses of ₹6.87 crore and allowed only ₹1.06 crore attributable to power supplied to MPPMCL under the 30% long-term PPA, as per regulations. It directed the petitioner to maintain separate, audited

records for such expenses and ensure proper reconciliation with annual accounts. The Annual Capacity (Fixed) Charges for FY 2024-25 were revised to ₹117.12 crore, resulting in a true-up increase of ₹1.23 crore based on actual plant availability.



RERC examined the Petition seeking approval of PPAs with Central Sector Generating Stations (CSGS) allocated by the Ministry of Power to Rajasthan and assessed them under the criteria of necessity and reasonability of cost as per

applicable Regulations. It noted that the provisional tariffs, subject to final determination by CERC, were benchmarked and found competitive, and that hydro and PSP projects would support RPO/HPO compliance, peak demand management, and grid stability. The Commission observed that tariffs and operational parameters shall be governed by CERC Regulations and that required details regarding allocation, CoD, and tariff filings were duly furnished. Accordingly, the Commission approved the PPAs executed with the concerned hydro and thermal generating companies as prayed for by the Petitioner.



UPERC approved the petition filed by Uttar Pradesh Power Corporation Limited seeking approval of the Power Purchase Agreement dated 4th June 2025 executed with NTPC Renewable Energy Limited and adoption of tariff discovered

through tariff-based competitive bidding for procurement of 400 MW solar power for 25 years. The petitioner approached the Commission to secure renewable power to meet RPO targets and promote green energy at competitive rates. After examining the bidding process and compliance with Section 63 guidelines, the Commission adopted the discovered tariff of ₹2.56/kWh and approved the PPA.



WBERC examined the petition filed by WBSEDCL seeking adoption of tariff discovered through a two-stage competitive bidding process (including e-reverse auction) conducted in accordance with the Ministry of Power Guidelines

dated 6th March 2019 under Section 63. Four bidders participated at RFQ stage and three bidders submitted financial bids at RFP stage. After e-reverse bidding, JSW Energy Limited emerged as L-1 bidder with a quoted tariff of ₹5.81/kWh. The Commission observed that the bidding process was transparent, competitive, and in compliance with approved RFQ, RFP and PSA documents. Accordingly, the Commission adopted the tariff of ₹5.81/kWh quoted by JSW Energy Limited for procurement of 1508 MW under long-term arrangement.

Regulatory Updates

Renewable Energy, RPO and REC



CERC issued a suo motu order determining the buyout price as an alternative compliance mechanism for fulfilment of Renewable Consumption Obligation (RCO), pursuant to the Ministry of Power notification dated 27th September 2025. The Commission initiated the proceedings to establish a market-linked framework for entities unable to meet RCO through renewable procurement or Renewable Energy Certificates. After stakeholder consultation, CERC determined the buyout price at ₹347/MWh for FY 2024-25 and FY 2025-26, with a 5% annual escalation up to FY 2029-30 to ensure regulatory certainty and balanced compliance costs.



MERC approved the petition filed by Maharashtra State Electricity Distribution Company Limited seeking adoption of tariff discovered through competitive bidding for procurement of 2000 MW/4000 MWh Battery Energy Storage System capacity with VGF support from PSDF to meet Energy Storage Obligations and manage renewable energy variability. The Commission held that the bidding process was transparent and the discovered tariff of ₹1,65,998/MW/month was competitive compared to other state procurements. Accordingly, MERC adopted the tariff and allowed execution of Battery Energy Storage Purchase Agreements with the selected bidders for 15 years.

MERC allowed the petition filed by Hatsun Agro Product Limited seeking directions to MSEDCL to permit Net Metering for its rooftop solar generating system along with Open Access. The petitioner approached the Commission alleging that MSEDCL wrongly applied gross metering after November 2023 despite regulatory amendments permitting simultaneous Net Metering and Open Access. The Commission held that the DOA (Second Amendment) Regulations, 2023 allow such simultaneous operation and directed MSEDCL to provide net metering credit adjustments, reconcile the claim amount with the petitioner, and pass the adjustments in subsequent electricity bills.



UPERC issued directions in the suo motu petition concerning non-compliance with the UPERC (Promotion of Green Energy through Renewable Purchase Obligation) Regulations, 2010. Upon submissions by UPNEDA, the Commission noted progress in registration and

compliance but directed UPNEDA to submit a consolidated report for all 474 obligated entities and ensure registration of the remaining entities on the RPO portal by 31st March 2026.

UPERC approved the implementation of Phase-1 and Phase-2 of the proposed pilot project for interstate P2P trading of renewable energy for a period of six months from the date of the order. The Commission permitted P2P transactions using blockchain/digital platforms with specified relaxations, including treatment of transaction charges, waiver/adjustment of certain surcharges and penalties (subject to conditions), and scheduling provisions for intraday transactions. The Commission clarified applicability of wheeling charges and transaction charges in line with DERC orders, allowed settlement through approved mechanisms, and directed compliance with reporting and smart metering requirements. The approval is limited to the pilot duration and subject to conditions specified in the order.

Others



CERC partly allowed the petitions filed by Serentica Renewables India 4 Pvt. Ltd. and ReNew group entities challenging revocation of their connectivity by CTUIL under the GNA Regulations, 2022. The petitioners approached the Commission seeking quashing of revocation notices and extension of connectivity timelines, citing delays due to uncontrollable factors such as land approvals, RoW issues, heavy rainfall, and regulatory clearances. Considering project progress and investments made, the Commission directed CTUIL to reconsider the revocation and evaluate project status before taking further action.



HERC in its order dated 16th January 2026 in Petition No. 71 of 2024, directed the distribution licensee DHBVN to refund ₹4,71,899 along with interest at 18% as earlier ordered by the Corporate CGRF, while observing that the licensee's repeated delays and procedural lapses in implementing the CGRF direction caused avoidable consumer hardship, mandated payment of ₹50,000 as court fee and ₹15,000 as litigation expenses to the petitioner, required an internal enquiry and disciplinary action against responsible officers, and emphasized strict compliance with CGRF orders and accountability of licensee officials under Sections 142, 146, and 149 of the Electricity Act, 2003.

Regulatory Updates



HERC partly allowed the petition filed by the Bureau of Energy Efficiency seeking adjudication of penalty against Power Star Electric LLP for manufacturing and selling 200 kVA distribution transformers without affixing

the mandatory BEE Star Label after expiry of its certification under the Energy Conservation Act, 2001. The petitioner approached the Commission alleging violation of statutory labelling requirements and proposed a penalty of ₹60 lakh based on estimated production. The Commission held the respondent in violation but reduced the penalty considering actual evidence and imposed a penalty of ₹1.5 lakh with additional conditions.

HERC allowed the petition filed by Nanti Hydro Power Private Limited seeking declaration of flash floods and cloudburst events of 31st July 2024 to 1st August 2024 as force majeure and quashing of transmission, wheeling, and SLDC charges levied by HPPTCL, HPSEBL, and HPSLDC. The petitioner approached the Commission after its 13.5 MW Upper Nanti Hydro Project was forced to shut down due to severe flood damage and collapse of the evacuation transmission tower. The Commission held the events to be force majeure, exempted the petitioner from charges up to 25th September 2024, and quashed the disputed invoices.



MPERC reviewed MPPTCL's petition for in-principle approval of ₹667 crore transmission strengthening works in the Sabalgarh area under Regulated Tariff Mechanism . Since the cost exceeded ₹400 crore, exemption from competitive

bidding was granted considering the project's strategic importance and urgent need for Morena Solar Park power evacuation. Accordingly, the Commission approved the project, subject to existing CAPEX conditions for the MYT period FY 2024-25 to FY 2028-29.



PSERC admitted and disposed of the petition filed by Punjab State Power Corporation Limited seeking revision of the interest payable on advance payment of electricity bills under Regulation 41(16) of the Supply Code, 2024. The

petitioner approached the Commission stating that the current provision requires payment of interest based on SBI's one-year MCLR even when the advance payment is for a shorter period, resulting in higher interest liability. The Commission referred the proposed amendment to the Supply Code Review Panel for recommendations before taking a final decision.



RERC approved the intra-state transmission connectivity procedure (33 kV and above) effective from 1st February 2026 in line with existing electricity regulations. It clarified that DISCOM bulk consumers will apply

through distribution licensees, while generators and open access consumers can apply directly to STU, with separate connectivity charges for RE and non-RE projects. The Commission rejected additional O&M and relinquishment penalty provisions and directed STU to publish the revised procedure within seven days.



UPERC approved the petition filed by Paschimanchal Vidyut Vitaran Nigam Limited seeking regulatory approval and relaxation of certain provisions of the UPERC Guidelines for Peer-to-Peer Solar Energy Transactions, 2019 to

enable an interstate pilot project for peer-to-peer trading of rooftop solar energy under the India Energy Stack framework. The petitioner approached the Commission citing the need to operationalize a blockchain-based digital energy platform and address regulatory gaps for interstate transactions. The Commission permitted the pilot project with specified relaxations and conditions for a limited duration.




Tariff Orders

State/Union Territory (SERC)	Licensee/Utility	True-up	APR	ARR	Tariff
BERC	NBPDCL, SBPDCL	2024-25	2025-26	2026-27	2026-27
JSERC	JUSNL, JBVNL	2024-25	2025-26	2026-27 to 2030-31	2026-27
PSERC	PSPCL, PSTCL	2024-25	2025-26	2026-27 to 2028-29	2026-27
HPERC	HPSEBL	2024-25	2025-26	2026-27	2026-27
MERC	MSEDCL, BEST, AEML, TPCL	2023-24	2024-25	2025-26 to 2029-30	2026-27
WBERC	WBSETCL	-	-	2025-26	2025-26

Regulations

Title	Date of Approval/ Notification
BERC (Deviation Settlement Mechanism and Related Matters) Regulations, 2025	6 th January 2026
CERC (Terms and Conditions for Renewable Energy Certificates for Renewable Energy Generation) (First Amendment) Regulations, 2026	24 th March 2026
CERC (Terms and Condition of Tariff) (Second Amendment) Regulations, 2026	20 th March 2026
CERC (Appointment of Consultants) (Sixth Amendment) Regulations, 2026	16 th February 2026
CERC (Terms and Conditions for Purchase and Sale of Carbon Credit Certificates) Regulations, 2026	27 th February 2026
HPERC (Consumer Grievances Redressal Forum and Ombudsman) (Fourth Amendment) Regulations, 2026	18 th February 2026
HPERC (Deviation Settlement Mechanism and Related Matters) (Third Amendment) Regulations, 2026	28 th March 2026
JERC for the State of Goa and UTs (Consumer Grievances Redressal Forum and Ombudsman) (First Amendment) Regulations, 2025	5 th January 2026
JERC for the State of Goa and UTs (Conduct of Business) (Seventh Amendment) Regulations, 2025	2 nd January 2026
TGERC (Licensee's Duty for Supply of Electricity on Request) (Second Amendment) Regulation, 2026	19 th January 2026
TGERC (Framework for Resource Adequacy) Regulation, 2026	24 th February 2026
TGERC (Terms and Conditions of Open Access) (First Amendment) Regulation, 2026	24 th January 2026
PSERC (Electricity, Supply Code, Standards of Performance and Related Matters) (First Amendment) Regulations, 2026	17 th March 2026

















3rd Regulatory Certification Program (RCP) on “Renewable Energy: Economics, Policy and Regulation”










































Centre for Energy Regulation (CER)
Department of Management Sciences (DoMS) | IIT Kanpur

Regulatory Certification Program (RCP) on "Renewable Energy: Economics, Policy and Regulation" | Dec 30 - Jan 11, 2026

Speakers & Dignitaries

 Prof. Anoop Singh Professor, IIT Kanpur	 Mr. Ghanshyam Prasad Chairperson, CEA	 Mr. Vinod Tiwari Global Head of Business Development & Partnerships, Power Ledger	 Mr. Abhishek Ranjan Chief Executive Officer & SVP, BSES Rajdhani Power Ltd	 Mr. P Ravi Kumar IAS (Retd.), Chairman, KERC	 Mr. Jeevan Kumar Jethani Scientist F, MNRE	 Dr. K. BALARAMAN Executive Director, Idam Infrastructure Advisory Pvt. Ltd	 Mr. Saurabh Diddi Director, BEE	 Mr. B.B. Mehta Director (SLDC), OPTCL	 Mr. Satyajit Ganguly Former Managing Director and Chief Executive Officer, PXIL
 Mr. Arun Goyal Former Member, CERC	 Mr. Vivek Pandey CGM, National Load Despatch Centre	 Mr. Milind Deore Secretary, Bureau of Energy Efficiency (BEE)	 Mr. Purnendu Chaubey SVP, Strategic BD & Policy, ReNew	 Mr. Pratik Prasun DGM, SECI	 Mr. Manish Mishra Director (R&R-I), MoP				

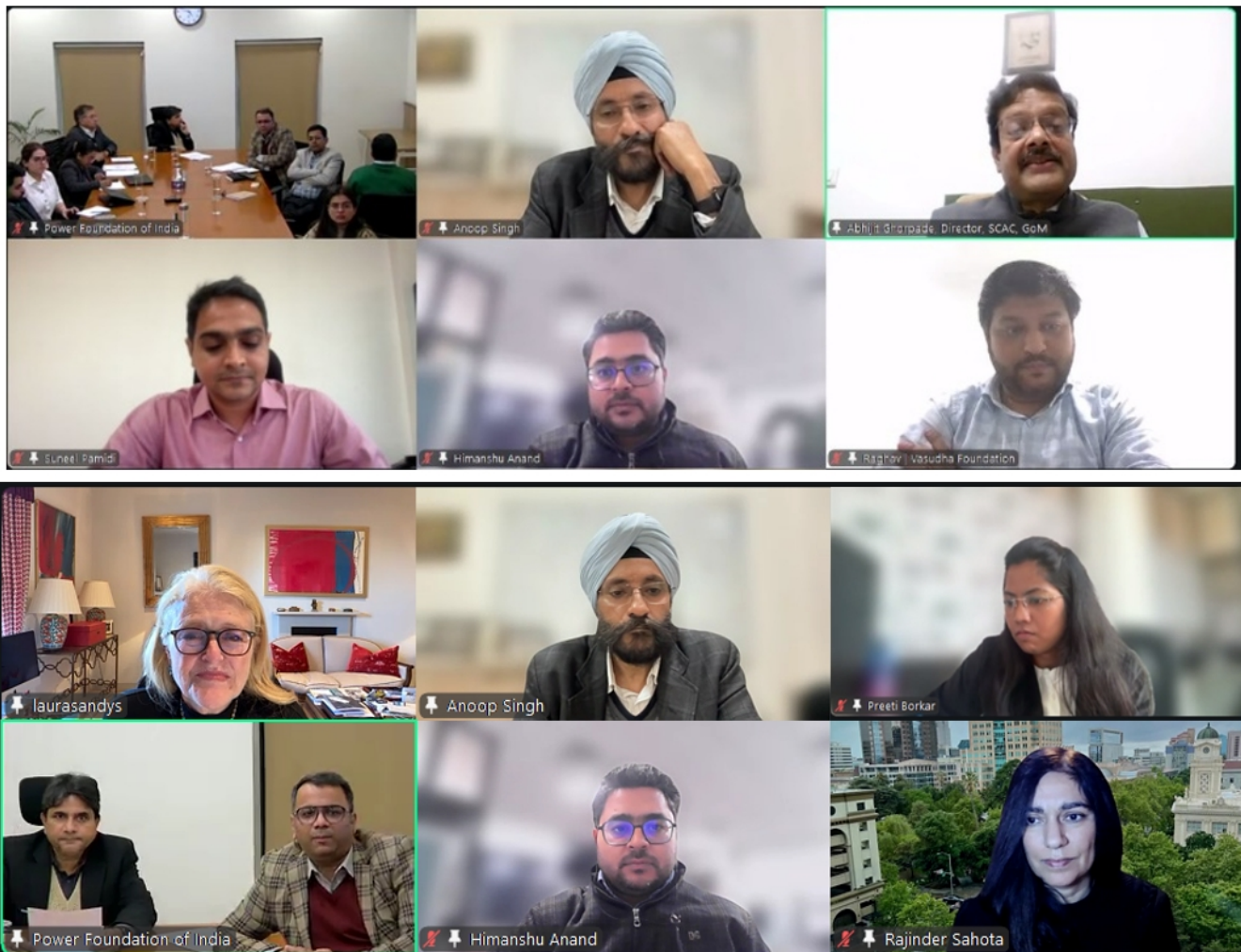
Participants

The Centre for Energy Regulation (CER), in collaboration with the Energy Analytics Lab (EAL), conducted the Regulatory Certification Program (RCP) on “Renewable Energy: Economics, Policy and Regulation” to provide a detailed perspective on the economic foundations for a better understanding of the evolving regulatory and policy framework for renewable energy. The online sessions for the program were scheduled from 13th December, 2025 to 11th January, 2026.

Key speakers for the program included Mr. Ghanshyam Prasad (Chairperson, CEA), Mr. Arun Goyal (Former Member, CERC), Mr. Milind Deore (Secretary, BEE), Mr. Manu Srivastava (Additional Chief Secretary, Department of New & Renewable Energy, Government of Madhya Pradesh), Mr. Manish Mishra (Director (R&R-I), Ministry of Power), Mr. Saurabh Diddi (Director, BEE), Mr. Jeevan Kumar Jethani (Scientist F, MNRE), Mr. Balaraman Kannan (Former Director General, NIWE, MNRE), Mr. Satyajit Ganguly (Former Managing Director & CEO, PXIL), Mr. Abhishek Ranjan (CEO, BSES Rajdhani), Mr. Vivek Pandey (CGM, NLDC), Mr. B. B. Mehta (Director (SLDC), OPTCL), Mr. Prateek Prasun (DSM, SECI), Mr. Purnendu Chaubey (Senior Vice President – Strategic Business Development & Policy Advocacy, ReNew), Mr. Vinod Tiwari (Global Head of Business Development & Partnership, Power Ledger), and Prof. Anoop Singh (Founder & Coordinator, CER & EAL, IIT Kanpur). Mr. P. Ravi Kumar, IAS (Retd.), Chairman, KERC, graced the valedictory function as the Chief Guest and presented certificates to the participants.

High-level Stakeholder Consultation on “Policy, Regulatory, and Institutional Framework for Net Zero: International, National and Sub-national Experiences”



The Centre for Energy Regulation (CER), IIT Kanpur, with support from the Power Foundation of India (PFI), successfully convened an online High-level Stakeholder Consultation on “Policy, Regulatory, and Institutional Framework for Net Zero: International, National and Sub-national Experiences” on 4th February, 2026. The workshop brought together leading experts, policymakers, and practitioners to deliberate on institutional pathways for the net-zero transition, drawing on Indian subnational experiences and lessons from international experience, such as the UK and California. The programme began with opening remarks by Mr. Anshuman Srivastava (Executive Director, PFI), followed by a thematic address by Prof. Anoop Singh, who outlined the evolving net-zero landscape and moderated the workshop proceedings. The first session, centred on sub-national pathways, featured perspectives from Mr. Abhijit Ghorpade (Director, State Climate Action Cell, Government of Maharashtra), Mr. Suneel Pamidi (Director, Directorate of Environment and Climate Change, Government of Kerala), and Mr. Raghav Pachouri (Associate Director, Vasudha Foundation), who reflected on emerging state-level approaches to climate governance. The second session focused on international experience, with Ms. Laura Sandys (Chair of Green Climate, Chair of the UK Energy Digitalisation Taskforce, Chair of the Energy Networks Innovation Taskforce) and Ms. Rajinder Sahota (Deputy Executive Officer, Climate Programs and Research, California Air Resources Board) sharing insights from the UK and California respectively. The event concluded with closing remarks from Mr. Himanshu Chawla (Head (Regulatory), PFI), who highlighted the significance of such stakeholder engagements in shaping India’s net-zero journey.

SAFIR Core Course on "Infrastructure Regulation: Markets, Green Energy Transition and Regulatory Governance"



The Centre for Energy Regulation (CER), IIT Kanpur, organized the SAFIR Core Course on “Infrastructure Regulation: Markets, Green Energy Transition and Regulatory Governance” from 6th to 9th February, 2026 at the IIT Kanpur Outreach Centre, Noida, supported by South Asia Forum for Infrastructure Regulation (SAFIR).

The program aimed to provide participants with insights into infrastructure regulation, evolving energy markets, regulatory governance, and challenges associated with the clean energy transition. This programme includes various stakeholders from countries such as Sri Lanka, Bangladesh, India, Bhutan, and Nepal, with backgrounds in power exchanges, regulatory commissions, legal domains, and related fields. The course brought together experts from regulatory bodies, government institutions, industry, and academia to share their perspectives and experiences.

The inaugural session was graced by Mr. Harpreet Singh Pruthi (Secretary, Central Electricity Regulatory Commission), as the Chief Guest. The program featured distinguished speakers including; Mr. Ghanshyam Prasad (Chairperson, Central Electricity Authority), Dr. Anil Kumar Jain (Chairperson, Petroleum and Natural Gas Regulatory Board), Dr. M. P. Tangirala (Member, Telecom Regulatory Authority of India), Mr. S. R. Narasimhan (Former CMD, Grid Controller of India Limited), Dr. Sushanta K. Chatterjee (Chief (Regulatory Affairs), Central Electricity Regulatory Commission), Mr. D. K. Srivastava (Chief Engineer, Ministry of Power), Mr. Sanjay Sen (Senior Advocate, Supreme Court of India), Dr. G. Raghuram (Former Director, IIM Bangalore) and Prof. Anoop Singh.

The valedictory function was graced by Mr. Jishnu Barua (Chairperson, Central Electricity Regulatory Commission), as the Chief Guest. The program also included site visits to Noida Power Company Limited (NPCL) and Grid Controller of India Limited (GRID-INDIA) to provide participants with practical exposure to power sector operations.

5th Global Regulatory Perspectives Programme (GRPP) for Commissioners of Electricity Regulatory Commissions

The Centre for Energy Regulation (CER), IIT Kanpur organized the 5th Global Regulatory Perspectives Programme (GRPP) from 11th to 13th February, 2026, in Lisbon, Portugal. Supported by the Forum of Regulators, the programme enabled Indian delegates to gain international exposure in Portugal through institutional visits, including Endesa, and regulatory exchanges with ERSE on market design, tariffs, governance, and emerging energy innovations.

The program featured distinguished speakers boards member from ERSE and other senior member from ERSE and EDP Labelec. The programme concluded with technical exposure visits, including a site visit to Tratolixo, an urban waste treatment facility, providing participants with insights into sustainable waste management and energy-related infrastructure. The programme was attended by Members of various State Electricity Regulatory Commissions across India, along with Prof. Anoop Singh. The valedictory function was graced by Ambassador Puneet R. Kundal, Ambassador of India to Portugal. In his remarks, he provided a concise historical perspective on the longstanding relationship between India and Portugal, highlighting its evolution and continued relevance in the contemporary context.



till 28th May, 2026

Regulatory Certification Program



CER in association with EAL, is pleased to announce the 6th Regulatory Certification Program on “Power Sector Regulation: Theory and Practice” commencing from 30th May to 21st June, 2026. The program would be conducted under the aegis of Centre for Continuing Education, IIT Kanpur. For further program details including program duration, key topics, schedule, admission process and fee, please visit: https://cer.iitk.ac.in/psr_reg/?id=1#register



The editor thanks Regulatory Insights team for their contribution in supporting the analysis, copy editing, compiling snippets of tariff orders, regulatory updates, and coordinating final production of this Issue.

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Disclaimer: The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavour to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.

Other Initiatives



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Note: Additional information can be accessed through the hyperlinks provided in the online version of this periodical.