



EVENT REPORT

Roundtable Discussion

BRIDGING THE RURAL-URBAN DIVIDE IN RELIABLE AND QUALITY POWER SUPPLY

A Path to Equitable Development

23 APRIL 2026 | India International Centre, New Delhi

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India's electrification journey is a globally recognised success, having achieved near-universal access and expanded installed capacity 391-fold since independence. Despite this progress, gaps in the quality and reliability of power between rural and urban areas continue to affect economic opportunities, financial inclusion, and overall development. Bridging this divide requires a coordinated approach spanning policy, regulation, infrastructure, and market design.

Against this backdrop, APCO India, in association with Chintan Research Foundation (CRF), organised a roundtable at the India International Centre (IIC), New Delhi, on 23rd April 2026 to address these disparities and align the power sector with the vision of Viksit Bharat@2047.

WELCOME ADDRESS



MR. YASH KANSAL
Senior Director, APCO

Mr Kansal highlighted that India's electrification journey is a globally recognised success story, marked by significant progress in expanding access to electricity nationwide. These achievements demonstrate the Government of India's sustained commitment to universal electrification and energy security. Despite near-universal connectivity, disparities persist in the reliability and quality of electricity supply between rural and urban regions. Addressing these disparities is essential not only for inclusive and equitable development but also for advancing the national aspiration of achieving Viksit India.

OPENING ADDRESS



DR. DEBAJIT PALIT
Centre Head,
Chintan Research
Foundation

In his opening remarks, Dr. Debjit Palit set the stage for a focused discussion on the often-overlooked issue of electricity quality and reliability in rural India. He emphasized that while India has achieved near-universal access to electricity, ensuring consistent and high-quality supply, particularly in rural areas, remains a major unresolved challenge.

He highlighted that India's updated Nationally Determined Contribution (NDC) is pragmatic and forward-looking but noted that the broader energy transition debate is still framed in developed-country terms, fossil versus non-fossil. For India, he argued, a more relevant framing is "electrons and molecules," stressing the need to accelerate economy-wide electrification over reliance on imported molecules. With electricity forming only about one-fifth of the energy mix, expanding its share is critical for efficiency and development.

Dr Palit pointed out that, unlike developed nations, India must simultaneously build new infrastructure and decarbonize, making long-term choices about energy systems crucial. In this context, distribution companies (DISCOMs), which are the interface between national-level policy and customers at the local level, become central, yet they remain the weakest link due to structural and financial challenges, undermining the broader energy transition.

He framed electrification as a three-stage process village connectivity, household access (largely achieved), and reliable supply (still lacking). A key concern raised was that DISCOMs are increasingly burdened with multiple mandates, diverting attention from their core responsibility of ensuring reliable electricity delivery.

While acknowledging reforms like smart metering, he stressed that without strengthening physical infrastructure such as feeders and transformers, such measures alone cannot improve service quality. The discussion called for rebalancing priorities toward infrastructure and service delivery. He also shared that the roundtable aims to generate actionable insights for a forthcoming white paper on improving rural electricity reliability and bridging the rural-urban divide.

KEYNOTE ADDRESS



MR. VIJAY KUMAR SINGH
Member (Power Systems),
CEA

In his keynote address, Mr Vijay Kumar Singh highlighted the remarkable transformation of India's power sector since independence, while underscoring the challenges that remain. Installed electricity capacity has grown from a modest 1,362 MW in 1947 to nearly 532 GW by March 2026, marking an almost 400-fold increase. Per capita electricity consumption has also risen significantly, from just 16 units to around 1,600 units. Despite this progress, India still lags behind developed economies, indicating the need for further expansion and improvements in quality and reliability.

Looking ahead, he emphasized that India's developmental ambitions will require a substantial increase in electricity consumption. Under the evolving National Electricity Policy, per capita consumption is projected to reach 2,000 units by 2030 and approximately 4,000 units by 2047, aligning with the broader vision of Viksit Bharat. These targets are essential to sustain industrial growth, enhance living standards, and support a modern, digital economy.

On the clean energy front, India has made notable strides, achieving 50% non-fossil-based installed capacity in June 2025 five years ahead of schedule. With installed and in-pipeline capacity from renewable projects, the country is on track to meet its 500 GW target ahead of schedule. Long-term plans also include scaling nuclear capacity to 100 GW, supported by reforms encouraging private sector participation. To support this growth, extensive planning is underway in both generation and transmission.

However, there is a need for more work in the distribution sector. While urban areas enjoy a relatively reliable power supply and modern systems, rural regions continue to face outages, voltage fluctuations, and limited-service quality. Although efficiency improvements have reduced AT&C losses to around 15%, they remain above global benchmarks, with some states exceeding 25% due to infrastructure and financial challenges.

He stressed that bridging the rural-urban divide is critical. This requires strengthening rural infrastructure, promoting decentralized renewable solutions, accelerating digitalization, and improving DISCOM finances. Ultimately, ensuring reliable and affordable electricity for all is not just a technical challenge but a developmental imperative central to achieving inclusive growth and the vision of Viksit Bharat by 2047.

SPECIAL ADDRESSES



MR. RAJ PRATAP SINGH
State Election Commissioner,
UP & Former Chairman,
UPERC (IAS Retd.)

In his special address, Mr Raj Pratap Singh emphasized that while India has achieved near-universal electrification, the real challenge now lies in ensuring reliable and high-quality power supply. The issue is no longer access alone but the persistent disparity in service quality between rural and urban areas, which continues to shape unequal development outcomes.

He highlighted a fundamental ambiguity in how electricity is treated in India's policy framework. During elections, it is often positioned as a social good, with promises of free or subsidized power. However, outside political cycles, it is treated as a market commodity requiring cost-reflective tariffs. This inconsistency leads to policy incoherence and hampers long-term planning. A clear and stable approach is needed to define electricity either as a public service or a market-driven commodity.

While schemes such as SAUBHAGYA have successfully expanded last-mile connectivity, they have also introduced technical and operational challenges. The rapid expansion of rural networks has increased their length and complexity, resulting in unfavourable voltage profiles and higher losses. Applying urban benchmarks to such dispersed systems is unrealistic without proper adjustments.

A major concern is the gap between the cost of supply and revenue realization, which limits investment in rural distribution. This financial mismatch leads to poor maintenance, delayed upgrades, and frequent disruptions. Regulatory frameworks often reinforce disparities by allowing faster service restoration in urban areas compared to rural regions.

Despite initiatives like PM KUSUM and RDSS, their effectiveness is constrained by weak implementation and the financial stress of DISCOMs. Even when infrastructure is upgraded, inadequate maintenance risks deterioration over time, raising concerns about sustainability.

The rural–urban divide is also evident in consumption patterns. Although rural areas house nearly two-thirds of the population, they account for only about 30% of total electricity consumption. Per capita consumption in rural areas is significantly lower, reflecting limited use beyond basic needs and agriculture. This creates a reinforcing cycle where low consumption restricts income growth, and low-income limits energy use.

He stressed that electricity must shift from being merely consumptive to transformative. Reliable supply is essential to support rural enterprises, value addition, and employment generation. However, gaps in measurement, data, and accountability hinder effective performance monitoring and service improvements.

To address these challenges, he called for strengthening DISCOMs, improving both supply and demand-side dynamics, and adopting a holistic approach that integrates technical, economic, and regulatory aspects. Ultimately, a shift toward viewing electricity as a service rather than just infrastructure is crucial for enabling inclusive growth and ensuring that electrification translates into real development outcomes.



MR. PANKAJ BATRA
Former Chairman, CEA and
Senior Advisor, IRADe

In his special address, Mr Pankaj Batra outlined the evolution of India's power sector and the central government's critical role in supporting states, particularly in addressing persistent challenges in the distribution segment. While electricity distribution constitutionally falls under state jurisdiction, the central government has consistently intervened through policy frameworks and financial schemes, recognizing the sector's capital-intensive nature and its treatment as a social good.

He traced the institutional development of the sector, noting that central generating companies such as NTPC and NHPC were established in the 1970s to address inefficiencies in state-level power generation. This, in turn, necessitated the development of a robust interstate transmission system, resulting in the creation of Power Grid Corporation of India. While generation and transmission became more stable over time, distribution remained a weak link.

To improve distribution efficiency, the government introduced several reform schemes, including APDRP, its restructured version, and targeted initiatives such as DDUGJY for rural areas and IPDS for urban regions. A major milestone was the launch of the SAUBHAGYA scheme in 2017, which shifted the focus from village-level to household-level electrification.

As electricity availability improved, the sector transitioned from addressing shortages to focusing on quality and reliability. Reforms under the Electricity Act, 2003, along with private sector participation, helped India move toward surplus generation capacity. Rural electricity supply hours increased significantly from about 10.5 hours per day in 2015 to over 22 hours by 2025 and access rates reached nearly universal levels. Despite these gains, significant disparities persist between rural and urban areas. Rural regions experience longer outages, weaker voltage quality, and inconsistent service compared to urban centers. Recognizing this, the Draft National Electricity Policy 2026 emphasizes rural quality improvement through measures such as renewable-based microgrids, enhanced data transparency, and separate tracking of service standards.

He stressed that technical solutions to these challenges already exist, including High Voltage Distribution Systems (HVDS), improved network design, and advanced monitoring tools like SCADA and outage management systems. Smart metering was highlighted as a key enabler of data-driven planning, improving load management, reducing losses, and optimizing procurement. He concluded that while India has successfully achieved scale in electrification, the next phase must focus on delivering reliable, high-quality power, especially in rural areas, through better policy, technology adoption, and institutional accountability.

PANEL 1: FROM ACCESS TO EQUITY – MODERNIZING DISTRIBUTION NETWORKS FOR RELIABLE RURAL AND URBAN POWER SUPPLY



Moderator:

Dr. Gaurav Bhatiani, Senior Fellow, Ashoka Centre for a People-Centric Energy Transition Ashoka University and Professor (Visiting), ISB

Summary of Discussion

The panel discussion highlighted that while India's power sector reforms, initiated in the 1990s, have successfully expanded generation capacity and achieved near-universal access, they have fallen short in delivering reliable and high-quality electricity to consumers. A central concern across speakers was the lack of customer centricity, with the sector continuing to focus more on supply-side achievements than on end-user experience. Consumer engagement remains largely reactive, confined to grievance redressal, rather than being embedded in service design and policy processes. Closely linked to this is the persistent lack of transparent, granular data on quality of supply. Although regulations and performance standards exist, weak enforcement and limited public disclosure of data such as outages, voltage quality, and system reliability undermine accountability and informed decision-making.

The discussion also underscored the continuing rural-urban divide in electricity service, driven by structural challenges such as dispersed populations, long feeder lines, and high technical losses in rural areas. However, speakers emphasized that reliability issues are not confined to rural regions alone, as even urban centres face voltage fluctuations and outages, pointing to systemic weaknesses in the distribution segment. Financial stress in distribution companies (DISCOMs) emerged as a critical bottleneck, limiting their ability to invest in infrastructure upgrades and maintenance. High losses, inefficient subsidy mechanisms, and the political difficulty of implementing cost-reflective tariffs contribute to a cycle of underinvestment and poor service quality, particularly in high-loss rural areas. Another key theme was the growing complexity introduced by renewable energy integration. While the transition to clean energy is essential, it is also intensifying system stress, especially during evening peak hours when solar generation declines and cooling demand rises. In such scenarios, weaker and less politically influential rural networks risk bearing a disproportionate burden of load shedding, potentially widening existing inequalities. The lack of adequate metering, especially in agriculture, further compounds the problem by limiting system visibility and the ability to conduct meaningful energy audits or enforce performance standards.



Speakers also pointed to significant gaps in infrastructure and human resources, particularly in rural areas, where centralized maintenance systems, shortages of trained personnel, and delays in equipment availability lead to prolonged outages. The discussion emphasized that improving reliability requires not only large-scale investments in physical infrastructure such as substations, transformers, and feeder segregation, but also strengthening local maintenance capacity and decentralizing operations. At the same time, institutional challenges, including limited regulatory capacity, weak enforcement, and declining public participation, were identified as key constraints in driving meaningful reform.

Importantly, the panel highlighted a fundamental disconnect between electricity tariffs and quality of service. Consumers often bear high implicit costs through alternatives like diesel generators and inverters, despite receiving poor-quality supply. This suggests that the issue is not merely affordability, but the lack of reliable service commensurate with the costs incurred. The need for better use of technology was also stressed, noting that while smart meters are being deployed, they are often not configured to capture QoS parameters, representing a missed opportunity for improving system monitoring and accountability.

Key Takeaways

- India's power sector must now transition from a focus on access and capacity to one centered on reliability, quality, and equity.
- Achieving this will require addressing foundational issues, including the financial viability of DISCOMs, transparent and accessible data systems, targeted investments in distribution infrastructure, and stronger, more capable regulatory institutions.
- Equally important is the need to adopt customer-centric approaches, encourage community participation, and ensure that the energy transition does not exacerbate existing inequalities.
- Without confronting these structural and governance challenges, the goal of delivering reliable, high-quality electricity for all will remain elusive.

PANEL 2: FROM ENERGY ACCESS TO ECONOMIC EMPOWERMENT – INDIA’S JOURNEY TOWARDS VIKSIT BHARAT 2047

Summary of Discussion

The panel underscored that India has largely moved beyond the challenge of achieving universal electricity access; the central issue now is ensuring reliable, predictable, and high-quality power supply, particularly in rural areas. This shift in focus reflects a deeper understanding that electricity must be treated not merely as a welfare provision but as a critical driver of productivity and economic growth. Reliable power is essential for enabling agriculture, supporting rural enterprises, and fostering small-scale industries, thereby helping bridge the persistent rural–urban economic divide.

As India advances toward decarbonization, the role of electricity in the overall energy mix is expected to expand significantly. This transition will require not only an increase in generation capacity but also enhanced system flexibility, improved reliability, and better alignment between supply and demand. However, existing tariff structures remain inadequate, as they fail to capture the true value of electricity particularly its temporal, locational, and reliability dimensions. There is a pressing need for tariff reforms that reflect these complexities while maintaining a careful balance between affordability and efficiency.

A key insight from the discussion was that longer hours of electricity supply do not necessarily translate into reliable service. Consumers place greater value on predictability and consistent quality



than on average duration of supply. In the absence of reliable power, many are compelled to invest in backup solutions, which significantly increases their overall cost burden and undermines the perceived affordability of electricity.

Despite notable progress in generation and transmission, the distribution segment continues to be the weakest link in the power sector. Persistent challenges include fragile last-mile infrastructure, frequent transformer failures, inadequate maintenance, and weak accountability mechanisms. These issues are compounded by limited access to accurate, real-time data, which restricts effective planning, monitoring, and regulatory oversight. In many cases, there is a clear disconnect between feeder-level supply data and actual consumer experience, largely due to the poor condition of distribution transformers and low-tension networks.

To address these challenges, the panel highlighted the potential of smaller, localized systems such as microgrids and decentralized distribution models. These approaches can enhance accountability, improve responsiveness, and deliver better quality of service, especially in underserved rural areas. At a broader level, the discussion emphasized that electricity in India performs multiple roles simultaneously—as a basic service, an infrastructure backbone, a productive input, and a market commodity necessitating differentiated and context-specific policy approaches.

Finally, the panel stressed that ownership, whether public or private, is less critical than the quality of governance, operational efficiency, and accountability. Success in the sector depends on management practices rather than ownership structures alone. With rapid advancements in solar energy, energy storage, and digital technologies, there is also a growing possibility that consumers may increasingly shift toward decentralized and self-sufficient energy systems, potentially reshaping traditional utility models in the years ahead.

Key Takeaways

- The next phase of reform must prioritize reliability, predictability, and customer-centric service rather than just expanding connections.
- Pricing mechanisms must evolve to reflect the true economic value of electricity, including time, location, and quality, while ensuring equity.
- Improving infrastructure and service quality leads to higher consumer willingness to pay and better financial sustainability for utilities.
- Strengthening last-mile infrastructure, addressing transformer failures, and improving operational practices are essential for sector performance.
- Reliable, transparent, and automated data systems are critical for effective planning, monitoring, and accountability.
- Smaller, localized distribution entities and microgrids can improve responsiveness and align services with local needs.
- Electrification strategies should focus on enabling productive use and local value creation, not just household consumption.
- Consumers are more willing to pay for electricity when supply is dependable and service quality improves.

- Aligning electricity policy with broader economic, rural development, and energy transition goals is essential for long-term impact.
- With rising aspirations and a young population, incremental improvements are insufficient—faster, systemic, and coordinated reforms are necessary.

OPEN HOUSE



Moderated by Dr Debajit Palit, Centre Head - Centre for Climate Change and Energy Transition, Chintan Research Foundation (CRF)

The discussion explored multiple dimensions of reliability challenges in India's power distribution sector, emphasizing that commonly cited explanations—particularly electricity theft—offer only a partial understanding of the problem. While utilities often frame theft as a key constraint to improving service quality, it was argued that reliability issues persist even in low-theft urban areas, indicating deeper structural and technical shortcomings. At the same time, theft and vandalism of infrastructure, especially transformers in rural areas, remain significant concerns, leading to financial losses and prolonged outages. Technological solutions such as real-time monitoring systems can help detect tampering and enable faster response, but these alone are insufficient without addressing underlying socio-economic and governance issues like poverty, weak enforcement, and limited local accountability. The conversation highlighted the importance of integrating data, technology, regulatory frameworks, and viable business models to improve power quality. Field experience from a solarized village in Gujarat illustrated both the opportunities and challenges of decentralized energy adoption. A proactive response by the distribution company supported by data analysis, infrastructure upgrades, and coordination with local administration demonstrated how timely interventions and stakeholder collaboration can resolve such issues effectively. This example reinforced the importance of strong relationships between DISCOMs, consumers, and local authorities in bridging the rural-urban power divide.

The role of cooperative models and decentralized systems was also discussed as a potential pathway for improving grassroots energy management. With the modular nature of solar technology, cooperatives could manage local assets, support performance improvements, and complement DISCOM operations, provided there is an enabling regulatory and institutional environment. Data-driven approaches, such as analyzing loss-making transformers and piloting localized solutions, were identified as promising strategies for improving financial and operational viability.

Overall, the key takeaway is that improving electricity reliability in India requires a holistic approach that goes beyond technical fixes. It must combine technological innovation with governance reforms, community engagement, data-driven planning, and institutional coordination, while also learning from successful domestic models that can be scaled and adapted to local contexts.

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