DUM 2025

Key takeaways from Inaugural Session

Shri Pankaj Agarwal, Secretary, Ministry of Power

- Since the enactment of the Electricity Act, 2003, India's per capita electricity consumption has increased from 612 kWh to 1,456 kWh in 2025. To realise the vision of Viksit Bharat @2047, the per capita consumption is projected to rise to 2,000 kWh by 2030 and 4,600 kWh by 2047.
- Significant recent progress include the RCO (Renewable Consumption Obligation) amendment and the introduction of the REC (Renewable Energy Certificate) buyout mechanism.
- India needs to achieve sustainability, energy security and affordability, which is called as Energy trilemma. Attaining all three goals simultaneously remains a key challenge.
- Global experience indicates that countries with higher renewable energy penetration tend to have higher electricity prices, with nearly 40% of costs attributed to network (wires). In India, network costs currently account for 20–22%, but are expected to rise as investment in grid infrastructure scales up.
- The country must adopt and utilise modern technologies. India's Smart Metering Programme, valued at Rs. 1.5 lakh crore, is the world's largest and comparable in scale to the investment under the RDSS loss reduction schemes. It is imperative that DISCOMs derive maximum operational and analytical value from smart meters through AI-driven insights and advanced data analytics; otherwise, the programme risks becoming a liability.
- For SCADA operations, capacity building at the junior personnel level is essential to ensure efficient system monitoring and control.
- Cybersecurity has emerged as a critical area of concern as the sector increasingly integrates IT/OT systems, automation, and data-driven decision-making. The current service readiness level remains low and must be strengthened.

Key takeaways from Session-1:

Special Plenary Session - Innovative Policies and Regulatory Interventions for Sustainability of Discoms

1. **Shri Alok Kumar**
   Moderator- DG, AIDA & Former Secretary, Ministry of Power

- Opened the plenary by grounding the discussion in a simple truth: **DISCOM viability is the backbone of India's entire power sector**. If DISCOMs fail, the entire chain-generation, transmission, renewables and smart grids will collapse.
- Pointed out that while India is progressing in reforms, policies, regulations, and ground implementation do not always align.
- Highlighted a practical issue: when Ministry or regulators release draft rules, comments must be submitted within 30 days. But many analytical studies (like cost impact or tariff modelling) take 6-9 months. Indicated that AIDA will need support from the Ministry to create a **rapid-response analytical team** capable of evaluating draft rules quickly.

2. **Shri Himanshu Chawla,** Power Foundation of India (PFI) made a presentation in which he brought out various fault lines in the power sector:

   A. Over past few years, there has been an improvement in the overall operational performance of the discom through reduction of AT&C losses but financial losses have increased. So, how do you make the discoms financially viable. The key challenges are:

   I. The existence of two financial accounting systems:

   1) **Audited accounts:** Show huge financial losses of Rs. 7 lakh crore+, LPSC burden, high O&M cost and high working capital requirements.
   2) **Regulatory accounts:** Show far lower financial losses of only Rs. 1.7 lakh crore of Regulatory Assets across all the states.

- The key issue is: **Which "cost" should define cost-reflective tariff?**
  - If audited costs are used, consumer tariff will explode.
  - If regulatory norms alone are used, DISCOMs sink deeper every year.
- Given state-level examples where:
  - LPSC of over Rs. 10,000 crore is not allowed by regulators.
  - Outstanding Government dues ~Rs. 83,000 crore distort collection efficiency and outstanding govt. subsidy ~Rs. 42,000 crore create huge cash crunch.
  - (Normative) Working capital norms allowed ~Rs. 900 crore while actual requirements exceed Rs. 7,000 crore.

Requested the sector to acknowledge these distortions honestly because "**financial viability cannot be built on parallel accounting.**"

II. Supreme Court Judgments

Time taken for case settlement is 5-6 years, and during this period, the impact of carrying cost which is compounding in nature is huge, which is eventually loaded on to consumers. Hence, it is important to look for ways to Reduce case load and improve efficiency in disposal of cases in higher courts.

III. Unmetered sales

Persistent problem of huge unmetered sales. Improper Energy Accounting leads to incorrect distribution losses. Measures needed to Expedite Metering measures.

IV. Deregulation of above 1 MW consumers - Draft bill

Electricity (Amendment) Bill, 2025 proposal of de-regulating consumers > 1 MW, could be a game changer. The cross subsidy for HT and LT is roughly Rs. 1.3 lakh crores and the government subsidy is Rs. 3 lakh crores. So if that is being boned by the government and if these set of consumers go out of the system, costly PPAs will go out.

- Energy Transition comes at a cost and hence judicious energy transition is the need of the hour.
  - As RE matures, it is important to reduce promotional measures so that actual cost becomes visible and provides correct price signals. Agro PV, without the impact of transmission losses and charges can be an effective energy transition element.
  - Need of Performance Based Regime for Transmission Utilities. Transmission losses to be linked with Transmission Charges (like in case of generation and distribution), which have been increasing over the years.
  - For financial turnaround, major stakeholders - state government, SERCs and Discoms should work cohesively for the betterment of power sector.

3. **Dr. Ashish Kumar Goel,** Chairman UPPCL and General Secretary, AIDA made a presentation in which he:
   - Shared AIDA's vision of **making DISCOMs viable, capable, and future-ready** through policy advocacy, capacity-building, and standardization of tech specs.
   - Admitted that the power sector data in India is not fully reliable because the numbers change depending on methodology (cash vs accrual, audited vs regulatory, provisional vs true-up).
   - Highlighted serious systemic issues:
     - Tariffs not cost-reflective
     - Irrational disallowances by regulators
     - Delayed tariff orders
     - Underfunded O&M cost
     - High financing cost (3% higher than Central PSUs)
     - Poor recovery from agriculture and rural consumers
     - Interest burden due to long delays in disposal of cases.
     - Complex tariff structure confusing consumers

- RCO compliance
- Cost of RE integration

- Proposed following major reforms:
  - **Tariff revision linked to WPI,** with multi-year true-up (every 3 or 5 years).
  - **Reduce financing cost**
  - Central policy to deduct unpaid panchayat electricity bills from Finance Commission grants
  - **Incentivize efficiency improvement through early completion of RDSS**, and prepaid meters.
  - **A National DISCOM Capacity-Building Fund** to strengthen AI, forecasting, cyber security, managerial skills
  - **Demand forecasting+ smart meter data analytics** to reduce expensive
  - short-term purchases
  - Strengthen APTEL for expeditious disposal of cases
  - Handhold States to adopt SCED
  - Government subsidies should be provided for green corridors rather than ISTS waiver
- Warned: huge subsidies and losses borne by states (~Rs. 6-7 lakh crore) are financially unsustainable.

4. Shri Pankaj Agarwal - Secretary, Ministry of Power (Chair of the Session)

- Acknowledged that DISCOM challenges are deep-rooted and accumulated over decades.
- Gave a candid message: **"There is no shortcut to financial sustainability of DISCOMs."**
- Raised concerns about smart metering. Even in TOTEX mode, it must come from ARR. Cash must come on the table, because even if first/second charge, all charges need to be honored.
- He suggested studies be undertaken to study positives and negatives of smart metering and recalibrate strategy accordingly.
- Stressed the importance of:
  - **Structured, anonymized data** to enable AI/ML forecasting
  - **Machine-learning driven forecasting using demand-generation triangulation** (weather + RE patterns + consumption)
  - Effective participation of DISCOMs personnel in resource adequacy planning and transmission planning (intra-state)
- Strongly encouraged reconciliation and mediation instead of litigation - the sector cannot bleed for 6-10 years waiting for court judgments.
- He suggested that development should be at point of consumption. Gave an example of green ammonia breaching 600 USD mark in India, while in Europe it is still around 1000 USD, but highlighted the transmission subsidy involved.
- Indicated that **good recommendations from the DUM 2025 will be included in the Electricity Policy**.

5. Shri P. Ravi Kumar, Chairperson, Karnataka ERC

- Offered a rare regulatory perspective grounded in both policy and field realities (he has been ACS Energy, Chief Secretary, and now ERC Chair in Karnataka).
- DISCOM is at the bottom of the pyramid, and even after 7 rounds of iterations in the Electricity Act, Public sector DISCOMs have not been able to achieve financial viability.
- Made bold, honest observations such as:
  - DISCOM employees still behave like old electricity boards - **commercial discipline is missing**.
  - Field-level implementation breaks down even if high-quality reforms are designed.
- Recommended strong structural reforms:
  - **Remove tariff slabs** which will enable prepaid metering and remove manipulation
  - **Eliminate cross-subsidy** - the governments should directly subsidize poor and agricultural consumers, not penalize the industry. Abolish the band of +/- 20% of Average cost of Supply, it should not be more than 1-2%.
  - **Government dues must be fully paid**, otherwise no tariff reform will succeed
- Warned against blaming regulators for all DISCOM failures - **We can regulate only what comes to us. The field reality is far deeper.**
- Tariff structure is fixed ex-ante. Lack of data w.r.t. consumer consumption behavior, number of consumers, impact of tariff hike on consumers, etc., is a key concern area for SERCs. Based on certain assumption, SERCs issues ARR for DISCOMs. This results in significant difference between projection and actual expenses of DISCOM while they file True-up Petition, and tariff can be increased only up to an extent.
- Ministry of Power is aggressively promoting Open Access. Then consumers who pay bill will go out. Further, the government proposes that after 4 years, no open access charges should be framed. Only stranded cost on Open Access Consumers. Currently, fixed cost recovery from consumer bill is only 30%, and 70% is borne from variable charges, and if one moves away from open access, then 70% cost is lost which cannot be recovered.

6. Dr. Srikant Nagulapalli, DG, Power Foundation of India (PFI) and Additional Secretary, MoP

- Deep dive into renewable energy integration challenges:
  - Solar/wind may be cheap per unit, but **variability adds hidden costs** (Balancing RE requires flexibilization of thermal and hydro power plants, as well as strengthening the transmission network to maintain stability, adding cost).
- Suggested four tools to reduce RE integration cost from supply side, and one from demand side (Demand response):
  - **Storage (BESS + PSP)**
  - **Flexibilization measures**
  - **Localization of RE** (rooftop, agri-PV, feeder solar)

- **Accurate forecasting and scheduling**

- Low-hanging opportunity: State governments can substantially reduce subsidy burdens by solarizing agriculture, including solar pumps, solar feeders, and feeder-level solarization; instead of going for BESS.
- MNRE has undertaken revised assessment of solar potential in the country, which highlights that most of the states have adequate solar potential to meet their electricity demand for next 20-25 years without excessive interstate transmission. To realize this potential within state, states must prioritize strengthening intra-state transmission networks.
- Strong push for **Tariff Based Competitive Bidding (TBCB)** for intrastate transmission to tap private investment and accelerate grid expansion.

7. Shri D. Radhakrishna, Former Chairperson, Tripura ERC

- Introduced two human-centric regulatory ideas: **"happy tariff"** and **"humanizing regulation."**
- Shared Kerala's success story:
  - Very low AT&C losses (~6.6%)
  - 99.5-100% collection efficiency
  - Six-day work week
  - Strict culture of accountability
  - Lower retirement age ensuring a younger workforce
- Suggested replicable ideas:
  - **Offer rebate for paying within 4 days** of bill submission - improves collection dramatically (Tripura experience)
  - **Strict enforcement for high-consumption families to upgrade to 3-phase connections**
  - **Better electrical safety and cyber safety norms**
- Warned that excessive court cases break the sector: one 2004 case was disposed only in 2024 - calling instead for stronger reconciliation and arbitration mechanisms.

8. Shri Gajendra Tiwary, Member, MPERC

- Clarified that the true meaning of regulatory assets (RA) - **RA are not assets,** but **postponed tariff hikes to meet the expenses already incurred by Discoms.**
- First regulatory asset was created in Delhi in 2004-05, amounting to Rs 696 crore, which has increased to Rs 27000 crore in 2024. Once regulatory assets are created, it is difficult to cut down, and it becomes a liability for consumers over time, if not liquidated in time.
- Explained how RA spirals:
  - Overestimation of sales
  - Underestimation of power purchase
  - Non receipt of subsidy

- Delayed true ups

All these leads to creation of RA which burdens consumers in later years.

- Legal framework for regulatory assets is defined under the 2006 and 2016 National Tariff Policies, Clause 8.2.2; Rule 23 of the Electricity (Amendment) Rules, 2024 limit: use only in exceptional circumstances.
- Supreme Court in a recent judgment observed that "disproportionate increase and long pending regulatory assets depict a regulatory failure" and a lack of firm decision-making by the commissions. Its strong message:
  - RA should be rare (force majeure only)
  - Cap RA at 3% of ARR
  - Liquidate within 3-7 years
  - Create transparent, time-bound roadmaps or trajectories for the recovery of these assets, including the carrying costs (interest)
- Emphasized predictive regulation and embedding performance-based accountability within the sector governance frameworks for fiscal discipline going forward.

9. **Shri Nilesh Kane,** Chief, Transmission & Mumbai Distribution, Tata Power Company Ltd:

- Focused on **technology-led cost optimization:**
  - AI/ML for forecasting with <1% error
  - Drones for maintenance
  - Sensors + SCADA for network monitoring
  - Robotic Process Automation (RPA) for metering, billing, collection to reduce manpower and errors
- Highlighted MERC reforms:
  - Behavioral based demand response program
  - Time-of-use tariffs (for residential consumers also) flattened load curve
- Stressed that better short-term, mid-term, and long-term power purchase planning significantly reduces power purchase cost (which is 70%+ of DISCOMs cost).

10. **Shri Abhishek Ranjan, CEO, BRPL**

- Presented a strong case for **distributed solar** and **solar + storage:**
  - Avoids T&D losses
  - Supports voltage stability
  - Reduces peak demand
  - Minimizes expensive short-term purchases
- Delhi's learnings:
  - Distribution transformers can handle **up to 75% equivalent solar** if

combined with local battery storage.

- Rooftop solar for residential consumers results in net gain for DISCOMs (supported by virtual net metering and group net metering), unlike commercial segments which heavily reduce cross-subsidy.

- Recommendation:
  - Dynamic subsidy models based on feeder hosting capacity
  - Inclusion of distributed BESS in integrated resource adequacy planning

Key Takeaways from the Session:

1. Urgent need to examine the gap between Audited accounts and Regulatory accounts of the utility and take regulatory interventions to remedy the imbalance.
2. Enable organizations like AIDA to expeditiously analyse the draft policy/ regulatory proposals and submit well evidenced responses in 3 to 4 weeks.
3. Tariff revisions by WPI linked formulae with MYT true up.
4. National policy for deducting electricity dues of Panchayati Raj Institutions (PRIs) centrally at state level from Finance Commission Grants.
5. Create a national fund for capacity building of Discoms in AI/ML, Smart meter data analytics, managerial skills, demand forecasting.
6. Consumer centric approach to speed up smart meter roll out.
7. Effective participation of Discoms in transmission planning process.
8. Tariff restructuring and balancing to ensure recovery of fixed costs and prevent misuse of slabs.
9. Guidelines required for Discoms to procure storage; whether Standalone, Hybrid, RTC, FORE.
10. Focus on promoting Demand Response and accurate Demand Forecasting to reduce RE integration costs.
11. Stronger push to TBCB for intra-state transmission projects to achieve competitive costs.
12. Replicate innovative steps like effective staff incentives in Kerala and rebate to consumers for timely payments in Tripura.
13. Timely true up to avoid regulatory assets.
14. Focus on technology led cost optimization in demand forecasting and power procurement planning, network maintenance etc.
15. Rational roll out of solar rooftop programme based on Feeder Hosting Capacity.

Key takeaways from Session-6:

Electric Vehicles – A $200 Billion Opportunity in India and Discoms Role in Making this a Reality

The session brought together representatives from Transport Authority (BEST), EV manufacturers (Tata Motors), Charge Point Operators (Tata Power, Charge Zone), DISCOMs (BRPL, Chandigarh Power Distribution Ltd), Financing institutions (GGGI), and other stakeholders (MERC, PFI, ISGF, IESA, Ador Powertron Ltd.) to deliberate on the opportunities, challenges, and the way forward for accelerating electric vehicle (EV) adoption in India.

Transport Authority (BEST) informed that it plans to **transition its entire fleet to electric** vehicles. The transition is expected to be smoother as BEST also functions as a DISCOM, ensuring synergy between transport and power supply operations.

PFI highlighted key barriers such as **high upfront cost of EVs and the limited availability of charging infrastructure**. Tata Motors concurred that the initial cost remains a challenge but emphasized that **recurring operational costs are substantially lower**. With appropriate subsidies and supportive financing models, affordability can improve over time.

Meanwhile, Charge Point Operators noted that **charging infrastructure is growing rapidly and is sufficient to support current EV penetration**. However, the moderator pointed out that long charging durations, typically 30–45 minutes after every 200 km, remain a major inconvenience for users.

DISCOMs highlighted how the **EV load impacts their grid**. BRPL highlighted that EV charging loads are **intermittent**, and may coincide with system peak demand, which can lead to grid issues and procurement of costly short-term power, as also noted in PFI's recent study. Meanwhile, CDPL shared that Chandigarh's electricity demand growth has declined by 7%, and **EVs could offer a new business opportunity** to reverse this trend.

IESA highlighted that **grid constraints and transformer capacity limits remain major hurdles for scaling fast chargers, especially in dense urban and highway corridors**. The **absence of clear V2G grid codes and regulatory frameworks** has delayed the move toward grid-interactive charging, while evolving standards for second-life battery reuse continue to limit circular economy potential. Low utilization rates in early markets make business models fragile, with revenues still largely dependent on energy sales. **Integrating battery energy storage systems (BESS) as microgrids can help address grid bottlenecks and make charging viable at disadvantaged locations**, creating resilient, renewable-integrated hubs that strengthen both mobility and grid stability.

Participants also observed that the high cost of batteries estimated at Rs. 15 lakh out of a total vehicle cost of Rs. 20 lakh remains the key barrier to mass adoption of EVs. When compared to internal combustion engine (ICE) vehicles with a 15–20 years life cycle (15 years in Delhi NCR, and 20 years in other states), **the total fuel savings over 2 lakh km may still fall short of offsetting the higher upfront cost of EV**. Hence, EVs are hindered by high upfront cost.

The panel discussed **battery leasing as the only feasible solution** which can make EVs a viable business model. In this, the battery is leased, and its cost is spread across its useful life of 7–8 years, making EVs more affordable and commercially viable.

It was collectively acknowledged that **grid management and planning will be crucial to handle the additional EV load effectively**. DISCOMs should plan infrastructure and demand management strategies to address intermittency and peak load issues. **Deployment of Battery Energy Storage Systems** (BESS) can help optimise both power purchase and network costs.

Business models such as Chandigarh's may be suitable for smaller states which are facing similar challenges, but cannot be generalised, given the cost implications (socialisation of cost) for other consumers. EV manufacturers must focus on **improving efficiency and reducing costs to make EVs accessible** beyond institutional (EESL) and government fleets. **Transport authorities should design viable fare structures** and operational models to ensure economic sustainability.

The session underscored that EVs present a transformative opportunity for India's transport and power sectors. Realising this $200 billion potential will require **coordinated action among all stakeholders, i.e. manufacturers, DISCOMs, regulators, financiers, and transport authorities**, to develop a sustainable, affordable, and scalable EV ecosystem.

Key Takeaways from the Session:

1) Stakeholders from transport authorities, EV OEMs (Original Equipment Manufacturers), Charge Point Operators (CPOs), DISCOMs, Regulators, and Financiers discussed EV adoption challenges and opportunities.
2) BEST plans full electrification of its bus fleet and noted smoother transition due to its dual role as a DISCOM.
3) High upfront EV costs and limited charging infrastructure remain key barriers; Tata Motors highlighted lower operational costs and the need for subsidies/financing.
4) CPOs reported fast-growing infrastructure, but slow charging (30–45 mins/200 km) remains a major user hurdle.
5) DISCOMs raised concerns about EV loads overlapping with peak demand, increasing grid stress and short-term power costs; Chandigarh DISCOM sees EVs as a new revenue opportunity. But Chandigarh-type models may work for small states but cannot be generalised due to cost socialisation issues.
6) Grid constraints, transformer limits, lack of V2G regulations, unclear second-life battery norms, and low utilization of charging points hinder scaling; BESS-based microgrids can ease bottlenecks.
7) Battery cost (₹15 lakh of ₹20 lakh vehicle) is the biggest barrier, as lifecycle fuel savings of ICE vehicles may not offset upfront cost of electric vehicles.
8) Battery leasing emerged as the most viable model to reduce upfront cost and improve EV affordability.
9) Effective grid planning, demand management, and BESS deployment are essential to integrate rising EV loads efficiently.
10) Business models may vary by state; manufacturers must cut costs and enhance efficiency to drive mass adoption, and transport agencies need sustainable fare and operational structures.
11) EVs present a major economic opportunity but require coordinated action across all stakeholders to build an affordable and scalable ecosystem.