MINUTES OF 94th MEETING OF FORUM OF REGULATORS (FOR)

Date /Day : **10th January, 2025; Friday**
Venue : **Assam Electricity Regulatory Commission Guwahati, Assam**
Timings : **10.30 am**
List of Participants: Appendix-I

Chairperson of Assam Electricity Regulatory Commission (AERC), in his welcome address to the Forum, provided an overview of the power scenario in Assam, which has 69 lakh electricity consumers, with domestic users being in the majority. He informed that Assam's current installed generation capacity meets only 17% of its peak demand, with the remainder procured through Power Purchase Agreements (PPAs) from central sector generating stations such as NTPC, NHPC, NEEPCO, OTPC, IPP, and also from Bhutan. He added that any shortfall in demand is managed through tenders on the DEEP portal or power markets and that the State has initiated efforts to promote clean, accessible, and affordable energy, aiming to increase renewable energy capacity from 309 MW to 1,200 MW by 2037

2. He highlighted the achievements of AERC, which included the introduction of several new regulations, including Demand-Response, Resource Adequacy Framework, group metering, net metering, virtual net metering for renewable energy, deviation settlement, ancillary services, etc. The power sector in Assam is expanding, aligning with developments in other states. The Chairperson welcomed participants of the 94th Forum of Regulators (FOR) meeting to Guwahati, extending special greetings to Justice Devaraju Nagarjun, Chairperson, TSERC, who was attending his first FOR meeting and wishing everyone a pleasant stay.

3. Chairperson, FOR/CERC, in his address, highlighted Assam's remarkable achievements in the power sector and congratulated AERC and other stakeholders for these accomplishments. He also reminisced about his enriching service tenure in the State and shared insights into the rich culture and history of the State. He added that the agenda items include addressing key challenges in Knowledge Sharing and Capacity Building Programs (CBPs) for Electricity Regulatory Commissions (ERCs), including proposals from IIFT and IIT Roorkee for CBPs, as well as discussions on reports from the FOR

Working Group on Discom viability and the Hydro Working Group. He thanked the former Chairperson of the Madhya Pradesh Electricity Regulatory Commission, Shri S.P.S. Parihar, who superannuated in the recent past, for his contribution to the affairs of FOR and especially for leading the working group on discom viability and congratulated him for coming out with an excellent report on a matter of such importance. He also welcomed Dr. Justice Devaraju Nagarjun, Chairperson of the Telangana State Electricity Regulatory Commission, attending his first FOR meeting. Lastly, he extended gratitude to the Chairperson, AERC and his team for their hospitality and excellent arrangements and requested the FOR Secretariat to take up the agenda items for discussion

AGENDA ITEM 1: CONFIRMATION OF THE MINUTES OF THE 93RD FOR MEETING HELD ON 13TH SEPTEMBER 2024

4. Joint Chief (RA), CERC, apprised the Forum about the action points in the minutes of the 93rd meeting of the FOR held on 13th September 2024 in Indore, Madhya Pradesh. One of the action points was with respect to GST issues and the decision to constitute a Committee to discuss and make recommendations to MOP. As this issue was already discussed with the Hon'ble Minister of Power in a special interaction with the FOR on 18th October 2024, the Forum was of the view that there was no need for the Committee. In this matter, the Forum discussed that as different ERCs have filed cases in various High Courts in the GST matter, the ERCs may await decisions of the Court before taking further action at their end. With this, the Forum confirmed the minutes of the meeting.

AGENDA ITEM 2: **FRAMING OF POLICIES FOR KNOWLEDGE -SHARING AND CAPACITY-BUILDING PROGRAMS FOR ERCs.**

5. The Forum was apprised of various capacity building programs (CBPs) being conducted in FOR for Chairpersons, Members, and Officers of ERCs which were supported/conducted/coordinated by various institutions viz. IITs/IIMs/IICA and USAID (under the Government to Government cooperation). As such, a need was felt for framing a policy for such CBPs with due regard to the decisions of the FOR in various meetings.

6. After detailed deliberations, the Forum decided on the following Framework for

Capacity Building Programs

a) There will be distinct programs for Chairpersons, Members, and other Officials of SERCs, JERCs & CERC.
b) Programs for Chairpersons will be held annually. The reimbursement for air travel (for the international component) would be premium economy class airfare (or business class if the premium economy is unavailable) based on the shortest direct route along with the return ticket.
c) Programs for Members and Officers will be held in alternative years. For international travel, the FOR Secretariat will reimburse economy airfare and the difference in fare between economy fare and their entitlement (as per their ERC policy) will be borne by the respective ERC.
d) FOR Secretariat to determine the ceiling limit of such airfare (being the highest cost of the ticket on the shortest and direct route ex-India) within 10 days from the date of announcing the program.
e) Government Institutions such as IITs/IIMs/IICA and Other institutions under Government-to-Government (GTG) cooperation may be engaged for arranging domain-specific sessions, site visits, and logistical support.
f) Booking Procedures: Air tickets (preferably in fully refundable mode), visas, insurance, etc, are to be arranged by participants either on their own or through their travel agents as per respective ERC policies.
g) Other Logistics: Hotel stay, local travel, and site visit expenses will be reimbursed by the FOR Secretariat to the designated SERC managing the arrangements.
h) Daily Allowance: Per diem, subject to a ceiling of 5 days for foreign travel (excluding travel time and as per Rules of Ministry of External Affairs, Government of India) will be reimbursed on submission of the final claim form after completion of the journey.
i) There will be no financial liability of FOR for costs in cases of extended stays or non-compliance with other travel route guidelines as above.
j) A three-member Committee of FOR will be constituted to coordinate the activities as per the above guidelines before the start of each CBP (which has an international component).

AGENDA ITEM 3: RECORD OF DISCUSSIONS OF MINISTER MEETING WITH FOR

7. The Forum was apprised of the action points of FOR consequent to the interaction of FOR with the Hon'ble Minister of Power on 18th October 2024.

a. Study report on constraints and remedial measures for implementing RCO targets.

8. The Forum was informed that a detailed analysis of a few States, viz. Andhra Pradesh, Assam, Himachal Pradesh, Punjab, Uttar Pradesh, and Gujarat have been completed by the FOR WG on RE related Policies, and a detailed presentation on the analysis and findings will be made in the next meeting of the WG scheduled on 17th January 2025. Thereafter, based on the recommendations of the WG, the report will be presented in the subsequent FOR meeting for necessary approval.

The Forum noted the same.

b. Proposal for a rebate mechanism to incentivize pre-payment meters.

9. The Forum was apprised of a compilation made by the FOR Secretariat on the existing provisions across various States with reference to rebates for pre-paid metering arrangements**.**

10. After detailed deliberation, the Forum noted the provisions in the regulations with respect to rebates in various States, which were in the range of 2-4 %, while some SERCs were allowing a prompt payment rebate ranging from 0.5 - 2 %. Hence, it was decided that individual SERCs may take a view based on the same.

AGENDA ITEM 4: REFERENCES FROM KSERC

(a) ENABLING ACCESS TO THE SCHEDULING DATA IN RLDC WEBSITES FOR STATE ELECTRICITY REGULATORY COMMISSIONS.

11. The Forum was apprised of the reference from KSERC seeking access to scheduling data from Regional Load Despatch Centres (RLDCs), which is currently restricted only to members, thus reducing public transparency in energy market information, trading volumes, and grid operations. Based on provisions of the Grid Code issued by CERC, Grid India introduced the New Web-Based Energy Scheduling Software (New WBES) on August 5, 2024, requiring mandatory user registration for detailed market and grid operation data access.

12. After detailed deliberations with respect to the need of the SERCs seeking access to such data, Chairperson, CERC, informed the Forum that the Commission will facilitate providing SERCs with access to domain reports as registered users.

(b) UTILIZATION OF FUNDING FROM PSDF/ NCEF FOR REDUCING THE TRANSMISSION CHARGES OF RAIGARH- PUGALUR- THRISSUR HVDC TRANSMISSION SYSTEM.

13. Joint Chief (RA), CERC apprised the Forum regarding another reference from KSERC wherein the issue of significant increase in Inter-State Transmission System (ISTS) charges due to changes in the regulatory framework under the CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020, and its amendments were brought to notice and requesting CERC / MOP to issue directions to PGCIL to avail maximum grant from PSDF/NCEF so as to reduce the burden of high capital cost of Rs 22000/- Crores for the said transmission system.

14. In this matter, the FOR Secretariat informed the Forum about the response received from PGCIL, stating that they have been vigorously pursuing with the Ministry of Power for the funds from PSDF so as to reduce the capital cost of the said line. The Forum noted the same and suggested that CERC may once again write to PGCIL to follow up with MOP for funds. Similar funding should be available for all projects of national importance.

AGENDA ITEM 5:

(a) DRAFT MOU BETWEEN IIT-ROORKEE AND FORUM OF REGULATORS

15. The members were informed that that the Indian Institute of Technology, Roorkee (IITR) wished to engage with the FOR to set up a “Centre of Excellence for Regulatory Affairs”

within the premises of IITR at their Greater Noida and Roorkee campuses.

16. The draft MoU was reviewed clause wise and after deliberations, the FOR approved in principle the said proposal and decided as under:

a) The draft MoU will be circulated to all ERCs for their input within 7 days, after which the MOU may be signed after seeking approval from the FOR Chairperson.

b) One-time payment towards the corpus of Rs 5 Crores as per draft MOU to be made to IIT-R, for which all members of the FOR are to make contributions with differential share for SERCs of North East and Sikkim. The differential contribution/share of ERCs will be finalized after seeking approval from the Chairperson, FOR/CERC.

(b) MOU/ENGAGEMENT WITH THE INDIAN INSTITUTE OF FOREIGN TRADE (IIFT) FOR CAPACITY BUILDING PROGRAMS.

17. The Forum was briefed on a proposal to have an MoU with IIFT to conduct various activities and workshops for the Forum. IIFT is an autonomous body under the Ministry of Commerce & Industry recognized as a Grade 'A' institution in 2005 and 2015, and has campuses in Delhi, Kolkata, Kakinada, and Gandhinagar. IIFT offers programs relating to the Electricity Sector in India with respect to Policy and Regulation carbon neutrality and issues; Renewable energy and regulatory framework, etc. Additionally, it also conducts field trips in both India and abroad as part of its programs to enhance experiential learning.

18. The Forum deliberated on the need for institutions to offer various types of CBPs and studies and approved the proposal to have an MOU with IIFT for need-based training programs and studies. IIFT will submit financial proposals on a case-to-case basis, which will be finalized with the approval of the Chairperson, FOR/CERC. The FOR Secretariat was directed to take further steps in this matter.

AGENDA ITEM 6: REPORT OF FOR WORKING GROUP ON "VIABILITY OF DISCOM."

19. Joint Chief (RA), CERC apprised the Forum of its decision taken in the 88th meeting

held on 13th October 2023 for constituting a Working Group on the "Viability of Discom" under the Chairmanship of the Chairperson of MPERC. The Working Group conducted five meetings and held comprehensive discussions on issues pertaining to the DISCOM viability in the country. The final Report was approved by the Working Group at its 5th Meeting held on 26th December 2024.

20. A presentation on the report **(Annexure I)** was made by the consultant assisting the WG. The Forum appreciated the efforts of the WG and noted the distinctive recommendations, especially on the O&M/manpower benchmarking, performance-linked incentives for employees, technological interventions, and administrative measures for efficiency improvement. After a detailed presentation, the Forum recommended that separate norms be explored for hilly States and NE States and to increase the threshold KPI to 80% to qualify for incentives. With this, the Forum adopted the report of the Working Group and suggested that the recommendations be forwarded to MoP and SERCs for suitable action.

21. As Chair of the WG, Shri S P S Parihar, Chairperson, MPERC, had demitted office, the Forum recommended co-opting Shri Kumar Sanjay Krishna, Chairperson of Assam ERC, as Chair of this WG so as to continue to deliberate and make recommendations on other issues assigned to this WG.

AGENDA ITEM 7: FOR - WORKING GROUP ON "EXPLORE MEASURES FOR ENCOURAGING HYDROPOWER DEVELOPMENT AND SUGGEST WAYS AND MEANS TO ACCELERATE HARNESSING HYDRO POTENTIAL (INCLUDING PUMPED STORAGE) IN THE COUNTRY."- UPDATE

22. The Forum was apprised of the constitution of the FOR WG on Hydro power development and its activities. The WG has conducted six meetings till date, and an update on the activities of the Working Group was presented **(Annexure II)** by the consultant assisting the Working Group.

23. After detailed deliberations, the Forum decided that the report be circulated to the members of the Forum for comments, and be taken up for consideration in a Special FOR meeting.

CONCLUSION

24. At the conclusion of the meeting, the Chairman, West Bengal ERC offered to host the next meeting of the Forum in April 2025 in Darjeeling.

25. Thereafter, the Secretary, FOR/CERC thanked the Forum members for their active participation in the discussion and decision on important agenda items regarding Viability of Discom report, guidelines for capacity building in FOR, engagements with leading educational institutions with FOR for capacity building etc. He also thanked Chairman, FOR/CERC, for his guidance and support in the meeting. He thanked Chairman of Assam ERC and his entire team for their hospitality and arrangements for the stay in Assam and for conducting the meeting in the elegant office of AERC. Lastly, he thanked the FOR Secretariat for their efforts in coordinating and conducting the meeting.

26. The meeting ended with a vote of thanks to the Chair.

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APPENDIX – I

LIST OF PARTICIPANTS OF 94th MEETING OF FORUM OF REGULATORS (FOR) HELD ON 10th JANUARY 2025.
ASSAM

S. No.	NAME	ERC
01.	Shri Jishnu Barua Chairperson	CERC/FOR – in Chair.
02.	Shri R K Joshi Chairperson	APSERC
03.	Shri Kumar Sanjay Krishna Chairperson	AERC
04.	Shri Amir Subhani Chairperson	BERC
05	Shri Hemant Verma Chairperson	CSERC
06.	Justice (Shri) Jayant Nath Chairperson	DERC
07.	Shri Anil Mukim Chairperson	GERC
08.	Shri Nand Lal Sharma Chairperson	HERC
09.	Shri D.K. Sharma Chairperson	HPERC
10.	Shri Rafi Andrabi Chairperson	JERC for UTs of J&K and Ladakh
11.	Shri P. Ravi Kumar Chairperson	KERC
12.	Shri Sanjay Kumar Chairperson	MERC
13.	Shri Rengthanvela Thanga Chairperson	MnERC
14.	Shri Chandan Kumar Mondal Chairperson	MSERC
15.	Shri Benjamin L. Tlumtea Chairperson	MzERC
16.	Shri Khose Sale Chairperson	NERC
17.	Shri Viswajeet Khanna Chairperson	PSERC
18.	Shri K.B. Kunwar Chairperson	SSERC

19.	Dr. Justice Devaraju Nagarjun Chairperson	TSERC
20	Shri Madan Lal Prasad Chairperson	UERC
21.	Dr. M.V. Rao Chairperson	WBERC
22.	Shri Gajendra Mohapatra Chairperson In-charge	OERC
23.	Ms. Jyoti Prasad Member	JERC for State of Goa & UTs
24.	Shri A.J.Wilson Member	KSERC
25.	Shri Prashant Kumar Chaturvedi Member	MPERC
26.	Shri Hemant Kumar Jain Member	RERC
27.	Shri K. Venkatesan Member	TNERC
28.	Dr. Sanjay Kumar Singh Member	UPERC
29.	Shri Harpreet Singh Pruthi Secretary	FOR/CERC
30.	Dr. Sushanta Kumar Chatterjee Chief (Regulatory Affairs)	CERC
	SPECIAL INVITEES	
31.	Shri Ramesh Babu V Member (Technical)	CERC
32.	Shri Harish Dudani Member (Law)	CERC
33.	Shri Alokeswar Bhattacharyya Member (Law)	AERC
34.	Shri Ashok Kumar Barman Secretary	AERC
	FOR SECRETARIAT	
35.	Ms. Rashmi Somasekharan Nair Joint. Chief (RA)	CERC
	OTHERS / GUESTS	
36.	Shri Sanjiv Kumar Singh Sr. V.P.	ABPS
37.	Shri Akhil Katiyar Regulatory Specialist	USAID/SAREP

Annexure-I

Presentation to Forum of Regulators

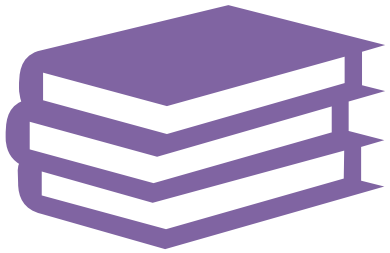
FOR Working Group report on

Viability of DISCOM

January 10, 2025

Guwahati

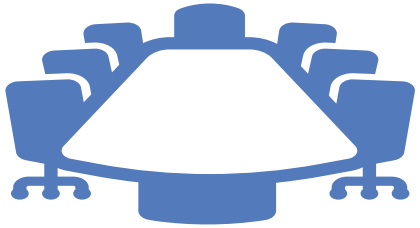
In this Presentation



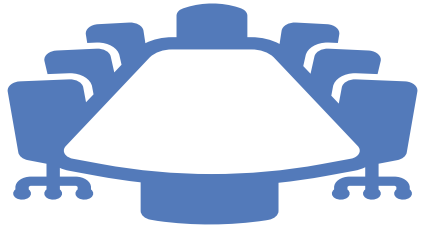
Background

Work & Activity Plan

Approach and Methodology



Case Studies



Factors influencing DISCOM Sustainability

Analysis and Benchmarking of Employee and Administrative Cost Structure

Recommendations and Way Forward

Background

The Forum of Regulators, in its 88th meeting held on 13th October 2023, deliberated extensively on the issue of the long-term sustainability of DISCOMs and subsequently constituted a Working Group to study their viability

Terms of Reference for the Working Group is as follows :

"

- *Identify and analyse the factors impacting the sustainability of DISCOMs.*
- *Examine the existing measures and suggest strategies for minimizing operational losses and enhancing efficiency.*
- *Analyze employee cost structures and make recommendations for optimization of employee cost.*
- *Suggest guidelines to reduce O&M and A &G costs of DISCOMs.*
- *Any other matter related and incidental to the above."*

The First Meeting of the FOR Working Group was held on 21st June, 2024 where following five paraments affecting DISCOMs sustainability were discussed.

ACS-ARR gap,

AT&C losses,

Regulatory Assets,

O&M cost,

Cross Subsidies

Timely Issuance of tariff orders and pass through of increased cost of procurement of power.

Work Plan

Based on discussion held during the first meeting, the following analysis was decided to be carried out :

1) *Each cost parameter of the ACS-ARR needs to be analysed. FOR Secretariat to study a few progressive discoms like Torrent, Tata, MSEDCL to understand their best practices.*
2) *The WG can explore fixing norms for each parameter and also arrive at benchmark principles. To this effect, a template is to be prepared and data to be collected from all SERCs.*
3) *Some Public owned and Private owned Discoms from Gujarat, Maharashtra, M.P. (Indore), U.P. (Agra) and Karnataka (who have made good progress in decreasing their AT&C losses) may be asked to present their success stories before the Working Group.*
4) *The O & M should be benchmarked either on number of consumers served or per MW basis. In this regard, data to be sought from discoms(public& private).*
5) *Obtain data from discoms (public & private) and analyse the methodology of determination of cross-subsidy surcharge and its impact on the viability of discoms.*
6) *The use of IT tools for data collection and analysis for tariff orders may be explored.*
7) *As viability of Discoms is critical to overall performance of power sector, therefore it may be useful to invite comments from other WGS of FOR as well to ensure wider consultation on the subject.*

Activity Plan

Several DISCOMs, including GUVNL, DGVCL, Tata Power-Odisha, TPDDL, MP West DISCOM, and Torrent Power Limited, were invited to share their success stories, with additional inputs provided by CESC, Rajasthan, and State Electricity Regulatory Commissions (SERCs).

During the fourth meeting, MP Central DISCOM highlighted key issues faced by Madhya Pradesh's distribution utilities, shared learnings, and suggested focus areas for the Working Group's consideration.

Followed by a detailed presentation by the consultant assisting the Working Group on the inputs received from DISCOMs and SERCs and the activities carried out against the Terms of Reference.

Further, Some suggestions were made by the members of the Working group, and it was decided an Interim Report be prepared based on the consultant's presentations and suggestions of WG, and the draft Report be circulated for consideration of the Working Group.

In the fifth and final meeting, the Working Group's Chairperson and members discussed the Draft Interim Report and endorsed the report with some modification. The WG also decided to place the Report before FOR for its consideration and approval.

Approach and Methodology

The Working Group adopted a structured and data-driven approach to carry out the tasks specified under the TOR. The approach and methodology included:

- **Case Studies of Successful DISCOMs**: Presentations were made by progressive DISCOMs, showcasing their **major accomplishments** and the underlying factors that **contributed** to the significant improvements in **operational and financial performance**. The Presentation also highlighted best practices followed that **have been proven** to be useful to **overcome operational and financial challenges**.
- **Inputs and Suggestions from SERCs**: Feedback from **various SERCs** was analysed to understand the **regulatory challenges** faced by DISCOMs such as **tariff structures**, **cross-subsidy management**, and other issues which are critical to ensuring a **sustainable power distribution system**.
- **Identification of Key Sustainability Factors**: Comprehensive analysis was undertaken to **identify the critical factors influencing the long-term sustainability of DISCOMs** such as financial health, operational efficiency, and effective management of cost structures.
- **Study of O&M and Employee Costs**: Detailed examination of the **O&M costs**, **particularly Employee-related expenses and Administration & General (A&G) expenses** was carried out including benchmarking of these costs.
- **Deliberation and Recommendations**: **Targeted recommendations** was put forward to address the **core challenges** faced by the DISCOMs.

- CASE STUDIES – DISCOMS - please give names

Case Studies Learning from DISCOMs……1/5

DISCOM	Achievements	Key Strategies/Initiatives
Gujarat Urja Vikas Nigam Ltd. (GUVNL)	▪ AT&C Losses, in the past decade, consistently below national average. AT&C losses in FY 2022-23 at 10.24%. ▪ Monthly cash collections doubled, growing from **Rs.3,257 Crore in 2016-17** to **Rs. 7,128 Crore in FY 2023-24.** ▪ Achieved consolidated **ACoS-ARR surplus**. ▪ Made significant investments in metering and grid modernization under the **RDSS**. ▪ **Skilled Manpower.** ▪ Improved system efficiency and financial stability with Rs.1 lakh Crore invested in transmission and Rs.10,602 Crore allocated for smart metering. ▪ Enabled uninterrupted power supply and reduced operational inefficiencies through innovative reforms.	▪ **Jyoti Gram Yojana (JGY): Segregated 11 kV feeders for uninterrupted non-agricultural power** and reliable agricultural supply. ▪ **Suryashakti Kisan Yojana (SKY):** Enabled farmers to **install solar systems**, ensuring consistent supply and income from surplus power. **Reduced subsidised LT consumption.** ▪ Establishment of **dedicated police stations, special courts and carry out proactive inspection, disconnection drives.** ▪ **Centralized Financial Management: Streamlined** billing processes and **optimized credit utilization**. ▪ Upskilled workforce through the **Gujarat Energy Training and Research Institute (GETRI)**. ▪ Leadership Development Program – PAHAL Initiative ▪ **Infrastructure Modernization:** Advanced Distribution Management Systems **(ADMS),** High Voltage Distribution Systems **(HVDS)**, and large-scale smart metering initiatives. ▪ **Consumer Engagement:** Digital platforms for online payments, complaints, and a paperless **Centralized Processing Centre (CPC)** for seamless service delivery.

Case Studies Learning from DISCOMs……2/5

DISCOM	Achievements	Key Strategies/Initiatives
Tata Power Delhi Distribution Ltd. (TPDDL)	▪ AT&C losses dropped significantly from **53.1% in FY 2002-03 to 5.9% in FY 2023-24**. ▪ Improved system reliability with ASAI reaching 99.9% in FY 20224 as against 70% in 2002 and transformer failure rates falling to 0.68% in FY 2024 from 11% in FY 2002. ▪ Revenue collection improved to 100%, complemented by high consumer satisfaction levels (97%). ▪ Successfully **installed 4.33 million smart meters**, promoting accurate billing and operational transparency. ▪ **Reliability Enhancements:** Expanded the network from **6,750 km (2002) to 14,108 km (2024**), increasing peak load capacity to **2,218 MW (2024) from 930 MW (2002)**. ▪ **Customer-Centric Innovations:** Reduced connection energization time from **51.8 days (2002) to 5.57 days (2024)**.	▪ **Reduction of AT&C Losses:** Regular **Energy Audits and DTR level**, **Automated Meter Reading** (AMR) systems for high revenue consumers. ▪ Adoption of **High Voltage Distribution Systems** (HVDS) and **LT ABC** in theft prone areas. ▪ Infrastructure Upgradation to **reduce transformer loading.** ▪ **System Modernization: Integrated SCADA and GIS technologies** to enhance service reliability. ▪ IT initiative such as **SAP/ERP** systems. ▪ Real time **Outage Management system.** ▪ **Community Engagement:** Tailored **outreach programs** to foster trust and compliance in underserved areas. ▪ Alignment of **CSR** with business goals.

Case Studies Learning from DISCOMs……3/5

DISCOM	Achievements	Key Strategies/Initiatives
Tata Power – Odisha DISCOMs	▪ Reduced **AT&C losses** from **30%-40%** in FY 2017-18 to **9%-16%** in FY 2024-25 across all four discoms. ▪ Enhanced financial performance with revenue increasing from **Rs. 9,869 Crore in FY 2018-19** to **Rs.18,999 Crore in FY 2024-25**. ▪ Transitioned PAT from a **deficit of Rs.1,562 Crore** in FY 2018-19 to a projected **profit of Rs. 540 Crore in FY 2024-25**. ▪ O&M Cost: Reduction in operational cost from Rs.1.66.kWh in FY 2018-19 to Rs.1.47/kWh in FY 2024-25. ▪ From cash deficit of Rs.1,562 Crore in FY 2018-19 to an estimated surplus of Rs.718 Crore in FY 2024-25. ▪ Reduction in ACS-ARR gap from 81 paise in FY 2018-19 to 23 paise in FY 2023-24.	▪ **Infrastructure Upgrades:** Invested Rs.5,600 Crore to modernize the distribution network with SCADA, Ring Main Units (RMUs), and smart meters. ▪ **Meter:** Replacement of defective meters with smart meters, ensuring transparency and accurate energy accounting. ▪ **GIS mapping, ADMS** ▪ **Employee Motivation – Promotions, group health Insurance.** ▪ **Societal Engagements – Mission Cheetah** ▪ **Consumer-Centric Services:** Introduced 24/7 call centers, digital payment solutions, and SMS-based outage communication.

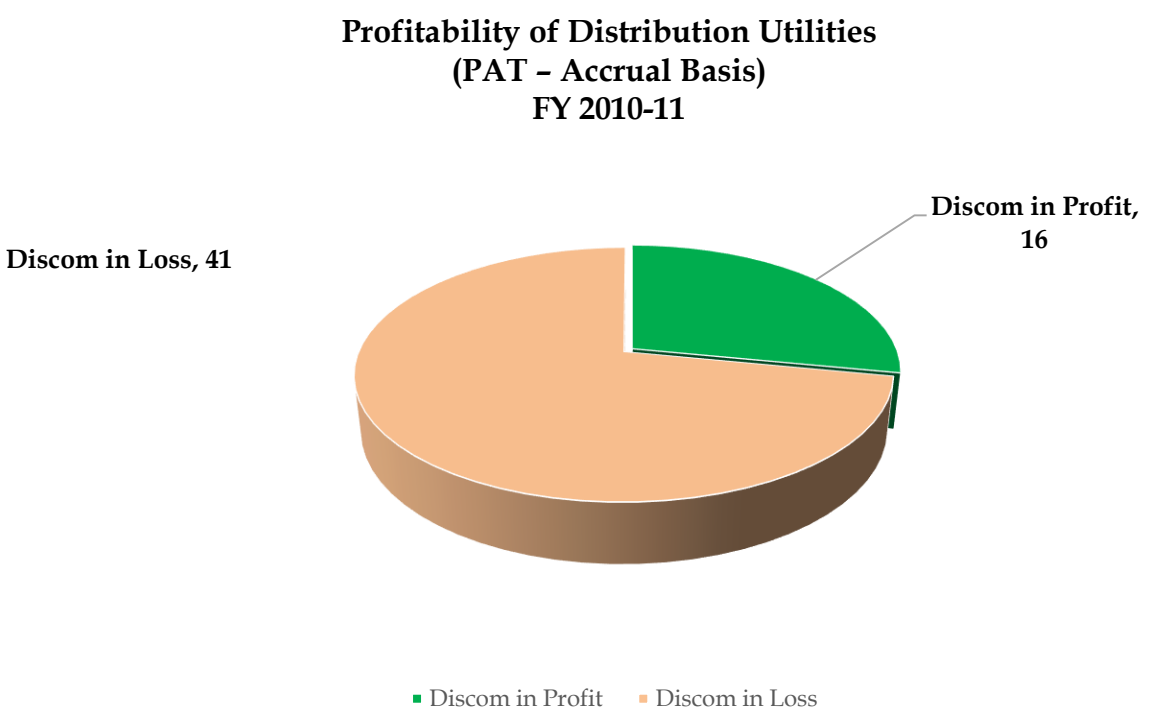
Case Studies Learning from DISCOMs……4/5

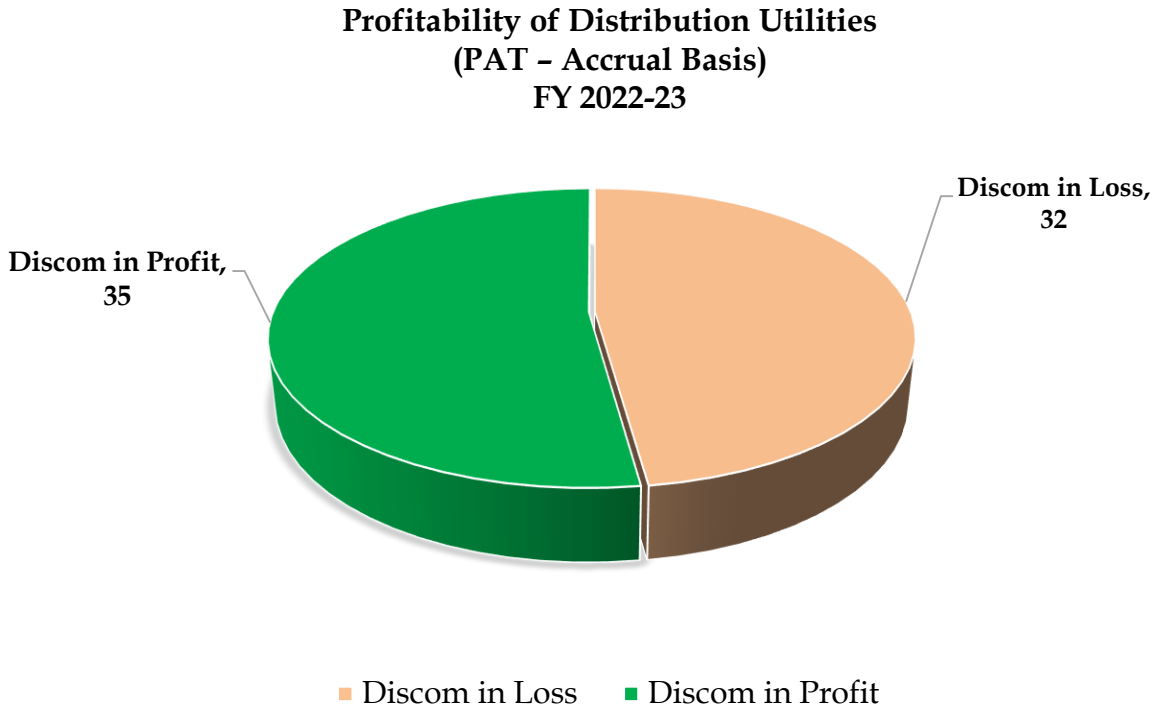
DISCOM	Achievements	Key Strategies/Initiatives
MP Paschim DISCOM (MPPKVVCL)	▪ Reduced **AT&C losses** from **25.26%** in FY 2015-16 to **10.88%** in FY 2023-24. ▪ **ACS-ARR gap** narrowed to a **Rs.0.33/kWh surplus** in FY 2023-24 from a **deficit of Rs.1.47/kWh** in FY 2020-21. ▪ **Smart meter deployment** identified discrepancies, **resulting in Rs.21.96 Crore of additional billing** and **Rs.308.63 Crore of arrear recovery**. ▪ **Feeder separation** led to **lower power purchase costs** and **optimized energy demand management**.	▪ **Loss Reduction Initiatives:** Deployed **smart meters** to improve billing accuracy and identify losses. ▪ **Feeder Separation:** **Dedicated agricultural** and **non-agricultural feeders** to optimize energy usage. ▪ **Revenue Strategies:** Streamlined **arrear recovery** with **targeted campaigns**. ▪ **New Vigilance information Systems :** Introduced NVIS to enhance the **vigilance and enforcement operations**, improve overall efficiency in electricity distribution and also **curb power theft and enhance monitoring**.
CESC Rajasthan (DFs)	▪ From FY 2016-17 to FY 2023-24, **AT&C losses significantly dropped** from **29.71% to 14.25%** in Kota, **27.43% to 10.16%** in Bharatpur, and **24.43% to 12.49%** in Bikaner, highlighting substantial improvements in efficiency. ▪ Enhanced **collection efficiencies to >99%** across Kota, Bharatpur, and Bikaner. ▪ **Strengthened consumer trust** through **efficient grievance redressal, real-time updates**, and **simplified billing mechanisms**.	▪ **Loss Reduction Strategies:** **IT-based loss monitoring, targeted metering, and energy audits**. ▪ **Customer-Focused Initiatives:** Launched mobile apps, **SMS-based billing**, and a **24/7 call center** for improved service. ▪ **Revenue Enhancement:** Implemented structured **follow-ups** and **arrear categorization** to improve collections. ▪ **Technological Advances:** Installed **DT-level energy audits** and **smart metering**.

Case Studies Learning from DISCOMs……5/5

DISCOM	Achievements	Key Strategies/Initiatives
TPL-Bhiwandi	▪ Reduced **AT&C losses** from **64.9%** in 2007 to **9.27%** in FY 2023-24. ▪ Achieved **100.41% collection efficiency**. ▪ **Improved power availability** from **75% to 99%**. ▪ Reduced **HT SAIFI** from **383.3** in 2007 to **33.93** in FY 2023-24 and **HT SAIDI** from **201.6 hours to 33.32 hours**. ▪ **Reduced transformer failure rate** from **40% to 0.74%**, ensuring higher service reliability.	▪ **AT&C Loss Reduction: Modernized theft-prone infrastructure** by replacing **overhead lines** with **underground** systems. ▪ **Metering Improvements: Legalized 1.25 Lakh unauthorized connections** through Ujjwal Bhiwandi Abhiyan (UBA). ▪ **Operational Enhancements:** Introduced digital tools like **Field Force Applications** and **Mobile Energy Bill Collection Vans**. ▪ **Technology Adoption:** Deployed **SCADA, RMUs, IoT**-enabled transformer monitoring units, and **Fault Passage Indicators** (FPI).
Torrent Power (Ahmedabad)	▪ **Improved SAIDI from 43.21 hours** in 1998 to **0.26 hours** in 2024. ▪ Reduced **AT&C losses** to **4.18%**, achieving **100% collection efficiency**. ▪ Expanded consumer base from 9.79 Lakh in 1998 to 20.99 Lakh in 2024). ▪ **Elevated customer satisfaction** with **seamless digital platforms** and **efficient service delivery**.	▪ **Reliability & Efficiency: Transitioned** from **overhead to underground networks**, **implemented AMR** for **high-value consumers**, and **adopted proactive fault detection** technologies. ▪ **Customer Services:** Enhanced **digital engagement** through **mobile apps** and **portals**. ▪ **Revenue Management: Strengthened metering**, **billing**, and **collection systems** to **combat energy theft**.

Distribution Utilities Profitability Analysis – FY 2022-23





Source: PFC Report on Performance of Power Utilities

Factors Influencing DISCOM Sustainability

- Based on the detailed presentations provided by the distribution utilities, inputs received from SERCs, WG identified following factors that directly affect the commercial viability and sustainability of DISCOMs.

  1) **AT&C losses**
  2) **Cross-subsidies**
  3) **O&M costs**
  4) **Human resource optimization and workforce management**
  5) **Timely issuance of tariff orders**
  6) **Regulatory assets**
  7) **ACS-ARR gap**

- Understanding of the above issues is vital for policymakers and stakeholders to devise targeted reforms.

- The above factors are co-related and therefore it is imperative that the relation between them is understood and to improve upon, a 360 degree approach is required.

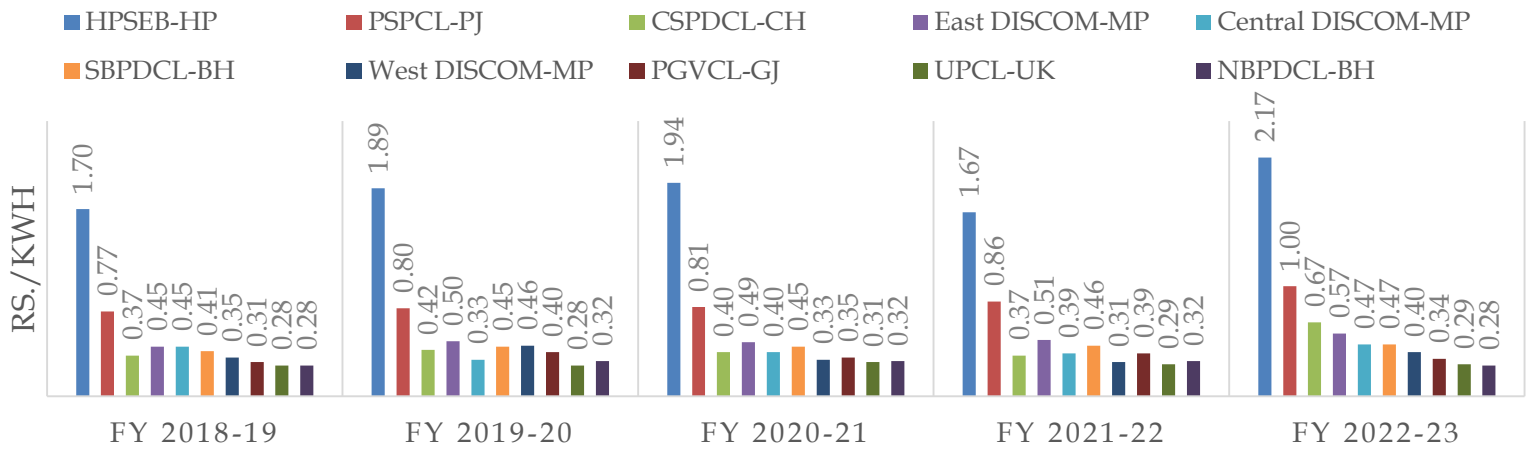
Correlation Between Performance Metrics: ACS-ARR Gap, AT&C Losses, Billing Efficiency, and Collection Efficiency

State	ACS-ARR Gap (Rs/kWh)		AT&C (%)		Billing Efficiency (%)		Collection Efficiency (%)	
	FY 2021-22	FY 2022-23	FY 2021-22	FY 2022-23	FY 2021-22	FY 2022-23	FY 2021-22	FY 2022-23
HPSEBL	0.09	0.8	12.9	10.59	87.25	89.41	99.82	100
JBVNL	1.61	2.47	30.85	30.28	72.51	69.72	95.37	100
MSEDCL	0.02	1.42	16.73	19.07	84.77	84.94	98.23	95.28
MePDCL	0.09	1.41	25.52	23.97	78.94	87.97	94.35	86.43
TANGEDCO	1.01	0.96	11.44	10.31	89.49	90.83	98.95	98.75
TSNPDCL	1.52	1.19	14.11	22.19	91.19	92.83	94.19	83.82
TSSPDCL	1.4.0	1.08	9.14	17.2	90.86	91.5	100	90.49
TSECL	0.53	1.00	31.17	28.15	75.26	75.3	91.46	95.41
DVVNL	1.63	2.08	31.04	24.04	74.36	78.41	92.74	96.87
MVVNL	2.51	2.39	35.63	24.22	82.64	84.94	77.89	89.22
PuVVNL	1.79	2.92	40.02	27.27	79.85	82.6	75.12	88.06
Andaman & Nicobar PD	2.83	0.51	19.8	19.81	80.74	81.86	99.33	97.96
Ladakh PD	0.39	1.99	48.29	30.33	59.48	69.67	86.94	100
BEST	1.60	2.06	7.89	4.18	95.37	95.82	96.59	100
Mizoram PD	1.32	2.07	36.23	26.27	70.55	73.73	90.39	100
TPSODL	0.38	0.74	34.26	31.32	76.64	75.04	85.77	91.53
IPCL	0.34	0.8	4.02	6.56	96.9	96.99	99.04	96.34

Source: RPM Meeting of MoP 18th and 19th Jan 2024

- There is a correlation between a large ACoS-ARR gap and low billing efficiency.
- It is observed that where there is significant ACoS-ARR gap, the billing efficiency is very poor establishing an inverse co-relation.
- Therefore, improving billing efficiency plays a central role in reducing AT&C losses.

Analysis of Employee Expenses to Sales

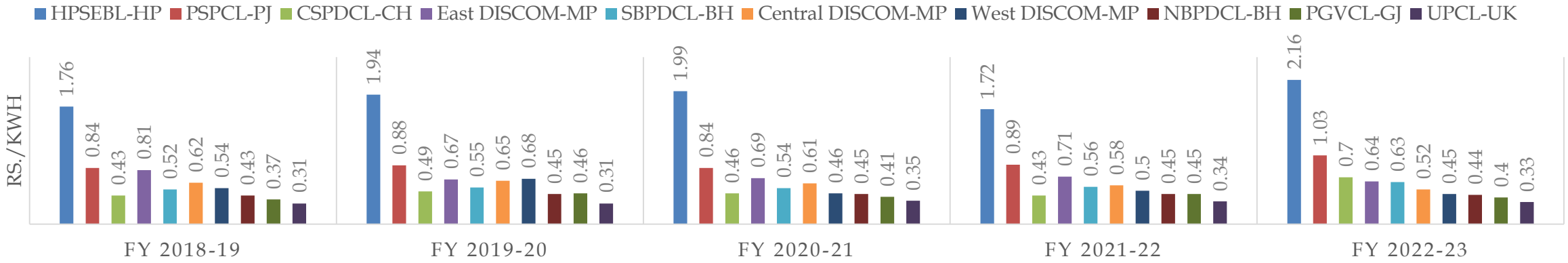


Source: Various Tariff Orders issued by State ERCs

DISCOM	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
HPSEB-HP	1.70	1.89	1.94	1.67	2.17
PSPCL-PJ	0.77	0.80	0.81	0.86	1.00
CSPDCL-CH	0.37	0.42	0.40	0.37	0.67
East DISCOM-MP	0.45	0.50	0.49	0.51	0.57
Central DISCOM-MP	0.45	0.33	0.40	0.39	0.47
SBPDCL-BH	0.41	0.45	0.45	0.46	0.47
West DISCOM-MP	0.35	0.46	0.33	0.31	0.40
PGVCL-GJ	0.31	0.40	0.35	0.39	0.34
UPCL-UK	0.28	0.28	0.31	0.29	0.29
NBPDCL-BH	0.28	0.32	0.32	0.32	0.28

- DISCOMs highlighted in green appears to represent the desired State of efficiency and financial performance.
- These entities indicate the potential outcomes of streamlined operations, optimized costs, and effective regulatory practices.
- However, it does not mean that there is no room for improvement even within this group, these DISCOMs should not be complacent to not try to further refine their operations, reduce inefficiencies, and aspire towards better operational efficiency.
- The DISCOMs that are better in terms of the benchmark cost appear to be on the right trajectory.
- The focus must remain on consistently implementing best practices and adapting strategies proven successful in other progressive utilities.

Employee and A&G Expenses per Sales



Source: Various Tariff Orders issued by State ERCs

DISCOM	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
HPSEBL-HP	**1.76**	**1.94**	**1.99**	**1.72**	**2.16**
PSPCL-PJ	**0.84**	**0.88**	**0.84**	**0.89**	**1.03**
CSPDCL-CH	0.43	0.49	0.46	0.43	0.70
East DISCOM-MP	0.81	0.67	0.69	0.71	0.64
SBPDCL-BH	0.52	0.55	0.54	0.56	0.63
Central DISCOM-MP	0.62	0.65	0.61	0.58	0.52
West DISCOM-MP	**0.54**	**0.68**	**0.46**	**0.50**	**0.45**
NBPDCL-BH	**0.43**	**0.45**	**0.45**	**0.45**	**0.44**
PGVCL-GJ	0.37	0.46	0.41	0.45	0.40
UPCL-UK	0.31	0.31	0.35	0.34	0.33

- **DISCOMs highlighted in green appears to represent the desired State of efficiency and financial performance.**
- **While the DISCOMs that are better in terms of the benchmark cost appear to be on the right trajectory, the focus must remain on consistently implementing best practices and adapting strategies proven successful in other progressive utilities.**

Employee and A&G Expenses as a percentage of ACOS

DISCOM	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	ACOS (FY 2022-23)	Expenses as a % of ACOS (FY 2022-23)
	Rs./kWh						
HPSEBL-HP	1.76	1.94	1.99	1.72	2.16	6.94	31%
PSPCL-PJ	0.84	0.88	0.84	0.89	1.03	7.09	15%
CSPDCL-CH	0.43	0.49	0.46	0.43	0.70	7.02	10%
East DISCOM-MP	0.81	0.67	0.69	0.71	0.64	7.16	9%
Central DISCOM-MP	0.62	0.65	0.61	0.58	0.52	6.80	8%
West DISCOM-MP	0.54	0.68	0.46	0.50	0.45	7.50	6%
SBPDCL-BH	**0.52**	**0.55**	**0.54**	**0.56**	**0.63**	**9.94**	**6%**
NBPDCL-BH	**0.43**	**0.45**	**0.45**	**0.45**	**0.44**	**7.10**	**6%**
PGVCL-GJ	0.37	0.46	0.41	0.45	0.40	7.64	5%
UPCL-UK	0.31	0.31	0.35	0.34	0.33	6.90	5%

Source: Various Tariff Orders issued by State ERCs

- DISCOMs highlighted in green appears to be around the desired level of cost efficiency. Anything below 6% is highly desirable and expenses in the range of 6-7% of ACoS is acceptable for Distribution Utilities in plain regions.
- Anything beyond 7% requires graded rationalisation. However, for Utilities in hilly areas and island areas, percentage will vary based on Utility specific factors and SERCs will have to consider those factors.
- This analysis underscores the importance of benchmarking workforce cost efficiency and provides a roadmap for all DISCOMs to achieve balanced and sustainable operations while ensuring robust infrastructure maintenance.

Recommendations and Way Forward….1/4

- **AT&C Loss Reduction**
  1. **Strengthening Distribution Infrastructure**
     - Ensure 100% metering of all connections, with functional meters.
     - Replace aging transformers and distribution lines with efficient transformers, advanced covered conductors, and switchgear (GUVNL/ TPDDL/ Tata Power – Odisha DISCOMs/ MP Paschim DISCOM/ TPL-Bhiwandi/ Torrent Power (Ahmedabad)/ CESC Rajasthan)
     - Leverage technological interventions, Advanced Distribution Management Systems (ADMS) Geographic Information System (GIS) mapping, and Supervisory Control and Data Acquisition (SCADA) systems (GUVNL/ TPDDL/ Tata Power – Odisha DISCOMs/ MP Paschim DISCOM)
     - Implement High Voltage Distribution Systems (HVDS) and LT Aerial Bunched Conductors (ABC) in high loss areas. (GUVNL/ TPDDL/ TPL-Bhiwandi/ Torrent Power (Ahmedabad))
     - To ensure DT-level metering and to conduct energy audits at the Distribution Transformer (DT) level to accurately map losses. (GUVNL/ TPDDL/ MP Paschim DISCOM/ TPL-Bhiwandi/ Torrent Power (Ahmedabad)/ CESC Rajasthan)
     - Undertake feeder separation in regions with significant agricultural consumption to reduce losses and improve load management. (GUVNL/ MP Paschim DISCOM)
     - Roll out smart metering, prioritizing high-loss areas, and consider retrofitting existing electronic meters as a cost-effective alternative. (GUVNL/ TPDDL/ MP Paschim DISCOM)
     - Introduce prepaid metering systems in areas with low billing efficiency to improve collection rates and reduce AT&C losses. (GUVNL/ MP Paschim DISCOM)
     - Adopt Advanced Metering Infrastructure (AMI) (TPDDL/ MP Paschim DISCOM)

Recommendations and Way Forward….2/4

- **AT&C Loss Reduction**

  2. Ways to improve Revenue Collection

  - **Minimize frequent waiver schemes,** implementing them judiciously, and treating any such waivers as subsidies by the State Government **to be paid in advance** to avoid financial disruptions.
  - **Any revenue recovery that is deferred by the State government including tariff subsidies, shall attract carrying costs, to mitigate working capital constraints.**
  - **Revalidate assessment methodologies for unmetered connections, particularly for agricultural consumers, based on current consumption patterns.**

  3. Displacing LT consumption

  - **Facilitate** the adoption of **distributed energy systems,** such as solar rooftops and energy storage systems (ESS), **to** reduce losses and enhance grid efficiency**. (GUVNL/ TPDDL/ TPL-Bhiwandi/ Torrent Power (Ahmedabad))**
  - Introduce **dynamic pricing to increase consumer awareness of real-time consumption costs and encourage demand shifts for efficient grid management.**
  - Explore **localized irrigation solutions** through **mini/micro-dam systems** to reduce **agricultural consumption.**

Recommendations and Way Forward….3/4

Particulars	Recommendations and Way Forward
Ways to Optimize O&M Cost	▪ Encourage State Governments to partially or fully assume liabilities for terminal benefits.
	▪ Transition from outsourcing manpower to outsourcing repetitive, non-critical activities to optimize costs.
	▪ Implement predictive maintenance technologies leveraging data analytics to reduce unplanned outages and emergency repair costs.
	▪ Utilize IT-enabled systems such as ERP/SAP for asset management to significantly lower administrative overheads.
Ways to Optimize Human Resource	▪ Continuation of Leadership (Managing Director) at the helm of affairs for at least 3-4 years is critical to make progress.
	▪ Conduct manpower skill audits to identify gaps and implement training, upskilling, and reskilling initiatives to enhance workforce productivity.
	▪ Introduce performance-based incentive structures to motivate employees to contribute.
	▪ Align employee Key Performance Indicators (KPIs) with organizational goals for cohesive and synergistic outcomes.
Rationalization of Cross Subsidies	▪ Gradually align tariffs with the actual cost of supply across all consumer categories to mitigate cross-subsidy migration risks.
	▪ Explore direct subsidy transfers to vulnerable consumer segments, such as residential and agricultural users, to support affordability without distorting tariffs.
Timely Issuance of Tariff Order	▪ Establish explicit timelines for the issuance of tariff orders in line with Section 64(3) of the Electricity Act, through appropriate tariff regulation provisions.
	▪ Streamline regulatory review processes by adopting standardized templates, predefined evaluation criteria, and simplified tariff formats to expedite decision-making.

Recommendations and Way Forward….4/4

Particulars	Recommendations and Way Forward
Measures to Avoid Regulatory Assets	▪ Ensure regular **pass-through of uncontrollable expenses**, such as **power purchase costs**, to prevent the accumulation of regulatory assets. ▪ Facilitate State Governments to assume or finance **legacy regulatory assets**, reducing carrying costs and enabling liquidation. ▪ **Issue tariff and true-up orders** within stipulated timelines to **maintain financial discipline**.
Platform for Sharing Best Practices	▪ **Establish a forum for distribution licensees to:** a) **Share best practices through periodic meetings.** b) **Serve as a repository of sectoral knowledge.** c) **Facilitate learning of technological advancements and sector updates.** d) **Represent collective concerns effectively and assertively.**
Subsidy Management	▪ **Ensure subsidies are paid in advance by the State Governments**. ▪ **Structure subsidies to deter malpractice**, such as consumers manipulating consumption to qualify for **subsidy thresholds**.
Recovery through Fixed Charges	▪ **Gradually increase the proportion of fixed cost recovery through the fixed charge component of retail tariffs**, targeting **30-50% recovery** to stabilize **revenue streams and mitigate financial uncertainties**.
Continued Government Support	▪ Advocate continued support from State and Central Governments for **debt restructuring**, **soft loans, and grants** for critical capital expenditures under schemes like RDSS. ▪ **Engage the Forum of Regulators (FOR) and State Governments in policy formulation to ensure balanced outcomes.** ▪ **Direct cost reduction benefits under Central Government policies to beneficiaries through grants, rather than increasing Average Cost of Supply (ACoS) and tariffs**.

KPI-Based Incentive Framework

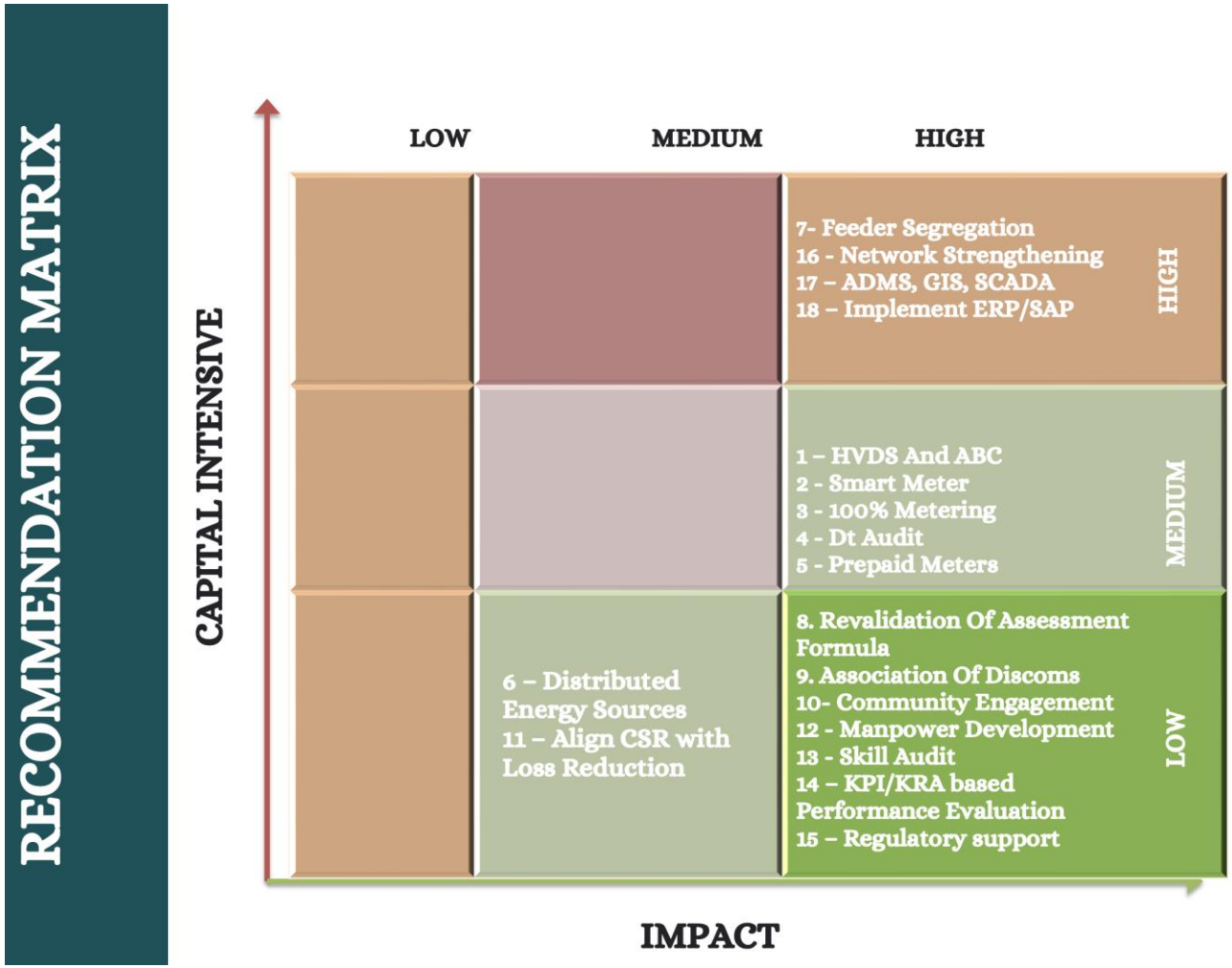
- A sample assessment matrix of **KPI based Performance appraisal system** has been prepared.
- To make this mechanism **self-sustainable**, it is proposed that incentive shall be allowed only if there is savings arising out of fulfilling these targets specified by the Commission.

Name of Distribution Licensees				Year under Evaluation	
Category	Overall Weightage	Sr. No.	Key Performance Indicators	Reference	Weightage (%)
(A) Loss Reduction	**40**	(i)	Billing Efficiency should not be lower than 90% for the Financial Year		40
			Collection Efficiency (>99%)		10
			AT&C Loss (%)	State Tariff Regulations	10
		(ii)	Provisional Billing/Assessment Bills shall not be in excess of the limits specified by the respective Commission	<5% of total Bills	10
		(iii)	Compliance to directions - Loss Reduction	Regulations, Orders issued.	10
		(iv)	Complete Consumer Indexing and GIS mapping		10
		(v)	Annual Energy Audit at DT Level		10
(B) Reliability	**20**	(i)	SAIFI, SAIDI and MAIFI Reports	As per SOP Regulation	30
		(ii)	Transformer Failure Rate	Reduction YOY	20
		(iii)	No Planned Load Shedding/Rostering		20
		(iv)	Approved Resource Adequacy Plan to meet power demand	As approved by Commission	30

KPI-Based Incentive Framework

Name of Distribution Licensees				Year under Evaluation	
Category	Overall Weightage	Sr. No.	Key Performance Indicators	Reference	Weightage (%)
(C) Capital Expenditure	**20**	(i)	Timely filing of Capex Plan for approval	As per Regulation	10
		(ii)	Timely completion of at least 80% of the planned capex		30
		(iii)	Non-Planned Capex not in excess of 10% of planned Capex		20
		(iv)	Nos. of Overloaded Transformer (>90% Rate capacity) should not be more than 10% of the total transformers.		10
		(v)	No unmetered Consumers		30
(D) Regulatory Compliance/Safety Compliance	**10**	(i)	Timely Filing of Tariff Petitions	Timelines specified under the Tariff Regulations	20
		(ii)	Timely submission of Compliance to Directives		20
		(iii)	Timely preparation of Audited Accounts		30
		(iv)	Regulatory Compliance with regard to Safety related issues.		10
		(v)	Compliance to Regulation 65(3) of EA – 03 - Subsidy		20
(E) Customer Satisfaction	**10**	(i)	Timely issuance of New Connections – At least 90% of the applications to be disposed of within the timelines specified under Supply Code and other relevant Regulations	Distribution Supply Code	30
		(ii)	Adherence to timelines specified for fault rectification and complaint addressal (90% complaints/request to be within the timelines specified under the SOP Regulation)	As per SOP Regulations	30
		(iii)	Online Portal for making Service Requests including application for new connections		20
		(iv)	Establishment of CGRF	As per CGRF Regulations	20
Total	**100**				

Recommendation Matrix



- The Recommendation Matrix is based on the analysis of issues affecting the financial and operational viability of the distribution utilities.
- Since each utility faces unique challenges, recommendations must be prioritized considering their specific context.
- Key prioritization factors include:
  a) Capital Intensity
  b) Impact on Operational Efficiency and Sustainability
- Recommendations have been categorized to address the utilities' varying needs, ensuring targeted and effective implementation.

List of Recommendations

S. No.	List of Recommendations
1	HVDS and Aerial Bunch Conductors
2	Initiating Smart Metering in high loss areas/ high value consumers – Implement Advanced Data Analytics tools for improved analysis and decision making
3	100% Connections to be metered
4	DT Level Energy Audit
5	Prepaid Meters and Automated Meter Reading in areas with low billing efficiency
6	Facilitating Distributed Energy Systems
7	Feeder Segregation - (Wherever high agricultural Load/consumer)
8	Re-validation of Assessment Formula wherever billing is being carried out on assessment basis.
9	Setting up of an Association of Distribution utilities – Facilitate Knowledge sharing and Policy Advocacy
10	Community Engagement - Consumer Awareness Campaign
11	CSR alignment with Loss Reduction Strategies - Building Synergy
12	Focus on Manpower Capacity Development
13	Manpower Skill Audit and Rationalisation/Re-deployment
14	KPI/KRA based Employee Accountability and Incentivisation
15	Tariff Revision - Cross Subsidy Reduction - Regulatory Support for KPI/KRA based Employee Benefit Scheme
16	Network Strengthening - Reducing Overloading of Lines and Transformers
17	Installation of Advanced Distribution Management, GIS, SCADA Systems
18	Implementation of ERP, Exploring IT/AI enabled services/Digital Transformation

Thank You!

ABPS Infrastructure Advisory Private Limited

Practical Solutions to Real Life Problems

Case Study – Major Factors behind success of Gujarat Discoms……1/3

The factors that contributed to achieving viability and sustainability of Gujarat's Discoms:

Structural Reforms: Early Unbundling of SEBs and Corporatization – **Front runner to Un-bundle**

Financial Reforms

- **Financial Restructuring:** Significant efforts were made to **clear past debts and improve financial health – Clean Balance sheet for Discoms – Loss taken over by GUVNL**.
- **Cost-Reflective Tariffs:** Tariffs were restructured to better reflect the cost of supply, for ensuring sustainable operations.

Operational Efficiency

- **Reduction of AT&C Losses**: Gujarat successfully reduced Aggregate Technical and Commercial (AT&C) losses through **better metering, theft prevention measures, and upgrading of infrastructure**. This included:
  - Implementation of **high voltage distribution systems (HVDS)** to reduce technical losses.
  - Strengthening the **enforcement against power theft through strict measures and the use of advanced technologies**.
  - Improved **metering and billing systems – Replacement of Mechanical Meters with Electronic meters**
  - Promotion of **Distributed Energy System**/**Rooftop solar**. (Distributed Generation – Reduces LT Losses)
  - Separation / bifurcation of agricultural feeders.
  - 24x7 Power Supply: Achieving a reliable and continuous power supply helped in improving revenue collections and consumer satisfaction.

Case Study – Major Factors behind success of Gujarat Discoms ……2/3

Renewable Energy Integration

- Promotion of Renewable Energy
- Enabling Policy Support towards Net Metering and Incentivizing Rooftop Solar

Regulatory Support

- **Effective Regulatory Framework:** Ensuring transparent, consistent regulatory oversight, regular tariff revisions and enforcement of performance standards.
- **Consumer-Friendly Policies:** Implementation of consumer-friendly policies and grievance redressal mechanisms improved consumer satisfaction and trust in the Discoms.

Government Initiatives

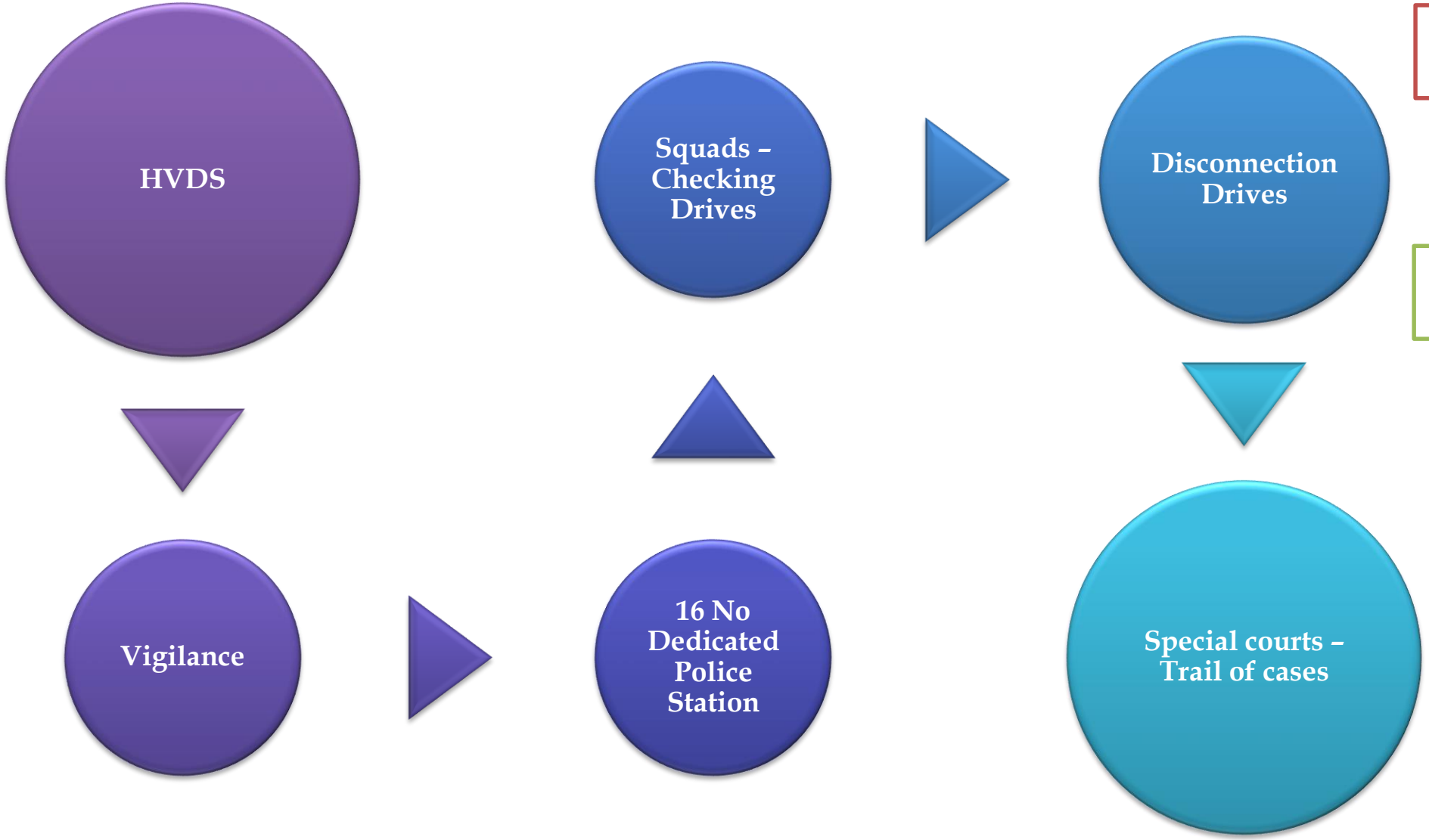
- **Jyotigram Yojana:** This scheme **separated agricultural feeders from residential and industrial feeders**, ensuring continuous power supply to households and industries while providing scheduled power supply to agricultural consumers. **Innovative Funding – 90% from State and 10% by Village** - This initiative **helped in reducing power theft and losses – Instilled Sense of Responsibility – joint ownership**.
- **Infrastructure Development:** Significant investments were made in upgrading and modernizing the distribution infrastructure, including the installation of **advanced distribution management systems (ADMS) and smart grid technologies**.

Case Study – Major Factors behind success of Gujarat Discoms……3/3

Capacity Building and Human Resources

- **Training and Development:** Continuous training programs for employees helped in building a skilled workforce capable of handling advanced technologies and improving operational efficiency.
- **Performance-Based Incentives:** Introducing performance-based incentives to encourage employees to be more accountable and perform better.

Initiatives for Reduction of AT&C Losses



Effective HR Deployment – Training, Collaborations and Engagements

Capacity building

Research and analysis

International tie-ups and partnerships

Academic institutions

Research organizations

Institutions working in the field of net zero emissions

Consultancy Services

Workshops, Seminars, Events

- Realised the importance of Upskilling/Re-Skilling of Employee Work Force – Instituted **GETRI** in 2006
- Even as early as FY 2005-06 – 620 different training programmes conducted – Focus Area – Technical, Behavioural Change towards Customers, Safety, Corporate Training.
- Benefitted from USAID & DRUM Project (Distribution Reform Upgrade and Management)

Effective HR Deployment – Training, Collaborations and Engagements

- **Ideation Premier League** – Created Strong Ecosystem for Employees to share ideas and Creativity with appropriate reward system for viable ideas.
- **PAHAL –** An initiative designed to recognise, celebrate, and motivate the exceptional team members, both as individuals and as a united force.
- Recognised the importance of maintaining Employee motivation through **Employee Welfare Activities**.
- Recognised Human Resource to be most valuable asset to the Company.
- Increased Employee Engagement through organising various social events.
- Carrying out Several Management Development Programme at **IITs/IIMs**

Financial Management

Centralized Financial Management – Optimum credit facilities of Bank

GUVNL –Management of Entire Working Capital

DISCOM Collection – Routed through GUVNL

GUVNL –Payment to Power Supplier – Rebates

Timely Subsidy Support from GoG

FPPPA

- Adjustments aligning consumer tariff
- Prompt pass-through of surplus
- Established Cost Recovery Mechanism

Outcome

Resource Adequacy Plan- APPC (Projected) will decrease by 21%, from Rs. 6.49/kWh to Rs. 5.05/kWh by the FY 2031-32.

By FY 2025-26, RE Generation will exceed RPO

Potential Revenue from Carbon Credit of Rs. 646 Crore

Inherited Loss of GEB Rs. 737.24 Crore - Now eliminated – Retained Earnings – Rs. 9578 Crore. (FY 2022-23)

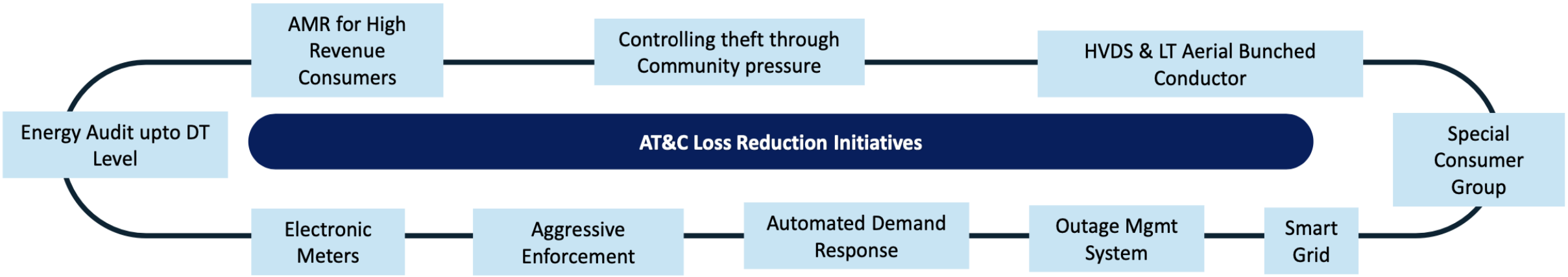
Case Study - Tata Power – Delhi (TPDDL)

Key Achievements

Initial challenges
AT&C Loss at **53%** - rampant theft
Dilapidated Network – on the verge of collapse
Unreliable Power Situation (**11%** Transformer failure Rate, **48%** Streetlight functional, **8-10 hrs** of Power cut)
Erroneous Consumer Database (**50%** of consumers had some form of an error)
> 1,00,000 Billing Complaints & **> 20,000** applications pending for New connection
No Computerization/Automation/Tracking & Monitoring
Absence of Consumer Relationship approaches

Parameter	Unit	July 2002	March 2024
OPERATIONAL PERFORMANCE			
AT&C Loss	%	53.1	5.9
System Reliability – ASAI Availability Index	%	70	99.9
Transformer Failure Rate	%	11	0.68
Peak Load served	MW	930	2218
Length of Network	Ckt km	6750	14108
Street Light Functionality	%	40	99.6
Smart Meters Installed	Lakh	0	4.33
CONSUMER RELATED PERFORMANCE			
New Connection Energisation Time	Days	51.8	5.57
Meter Replacement Time	Days	25	3
Mean Time to Repair Faults	Hours	11	.9
Consumer Satisfaction Index	%	-	97

Initiatives for Reduction of AT&C Losses

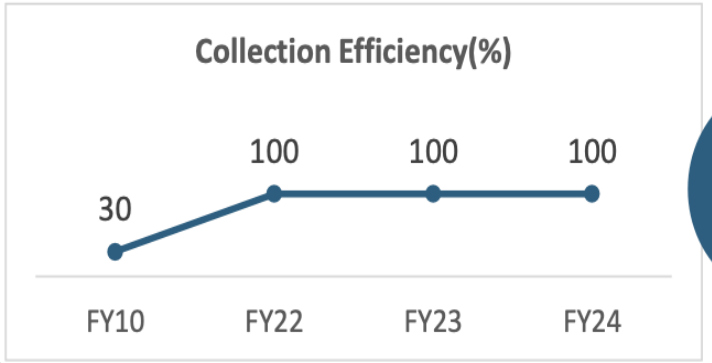


Handholding Customers in slum areas for new connection, query resolution and facilitating collection of energy dues through customer outreach and counselling

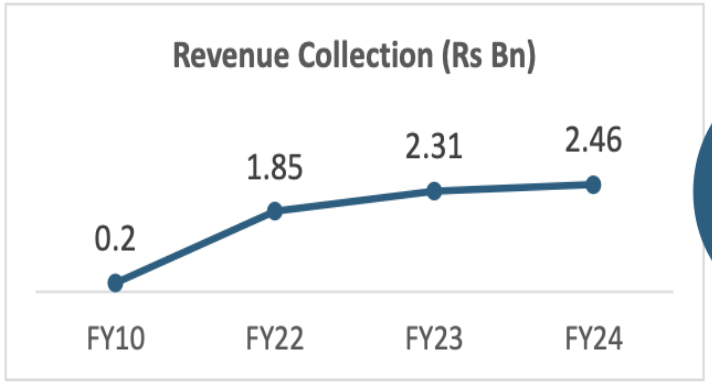
Serving ~1 Mn Population (bottom of pyramid of Society)	**218** Slum Clusters	**0.26 Mn** Customers	**Rs. 246.46 Cr** Annual Billed Demand	**Rs. 246.46 Cr** Annual revenue collected

Uniqueness

- Unique Model aligning CSR with Commercial gains
- Reduced losses in critical areas without coercion
- Slum ladies becoming TPDDL Brand Ambassadors



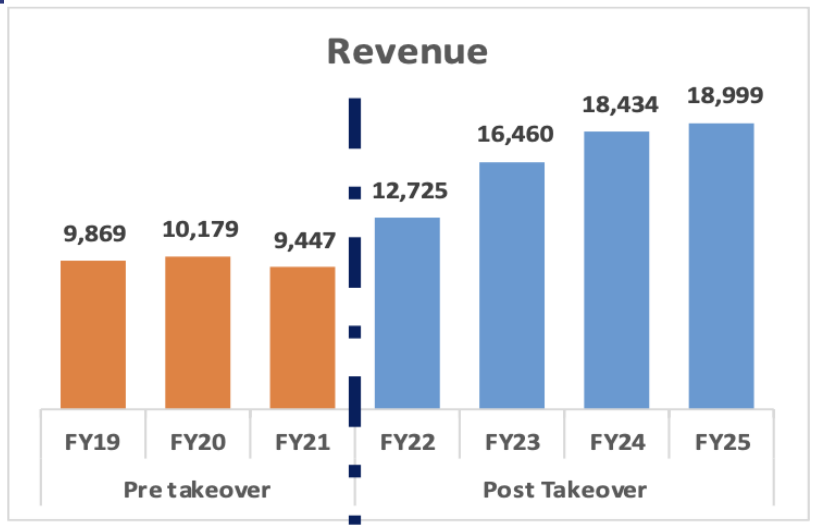
2002 Collection efficiency < 10%

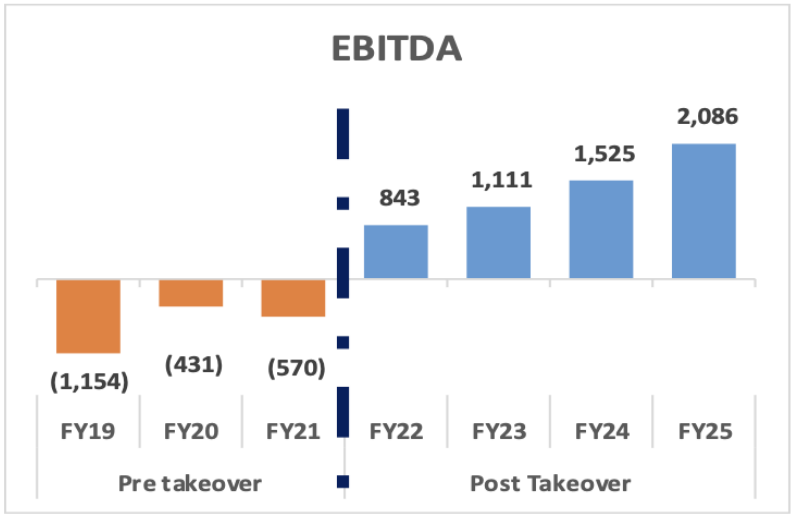


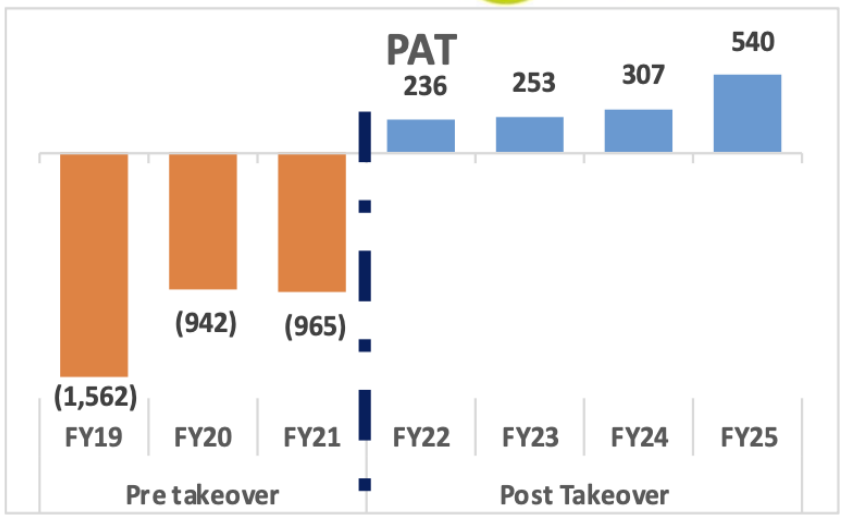
2002 Revenue Collection < 1 Cr.

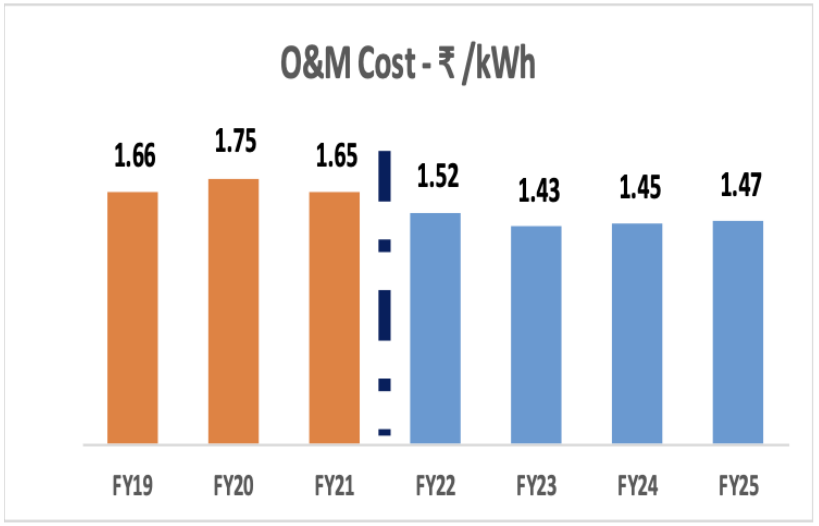
Case Study - Tata Power – Odisha

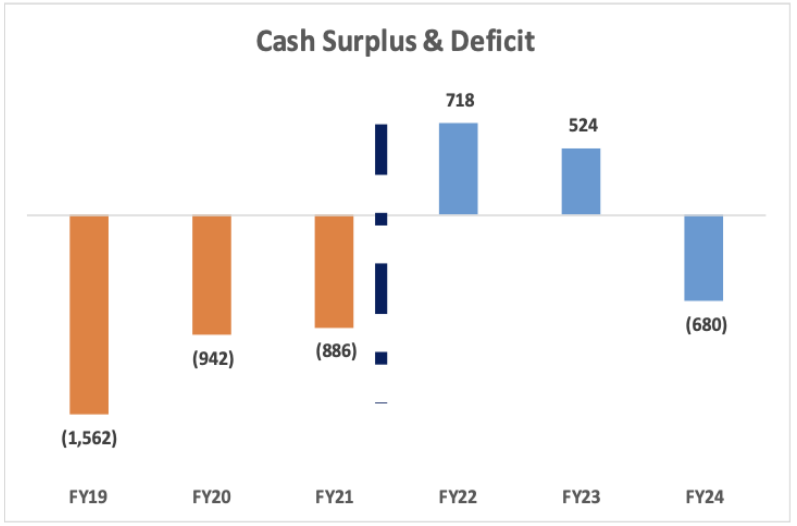
Key Achievements (1/2)

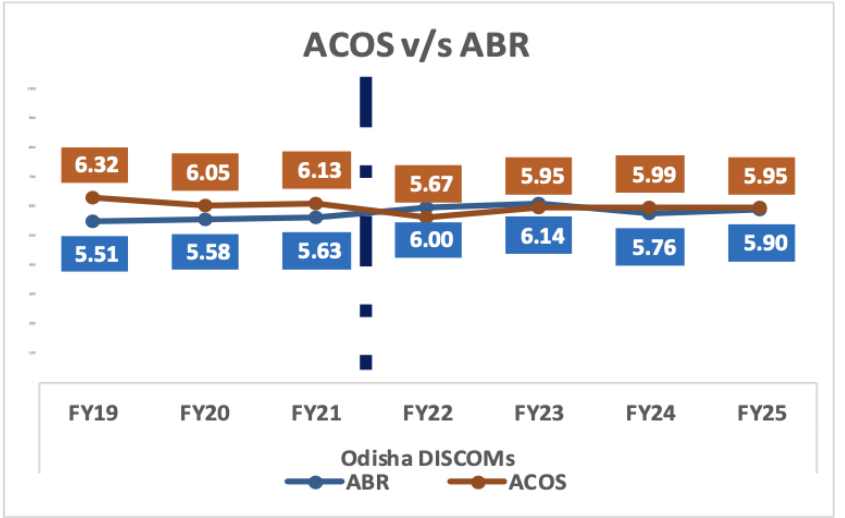




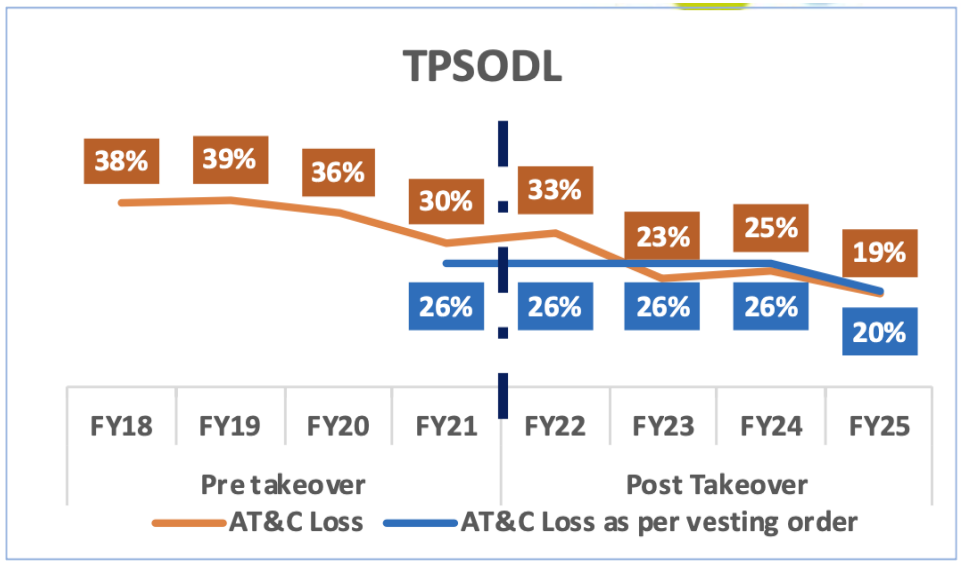


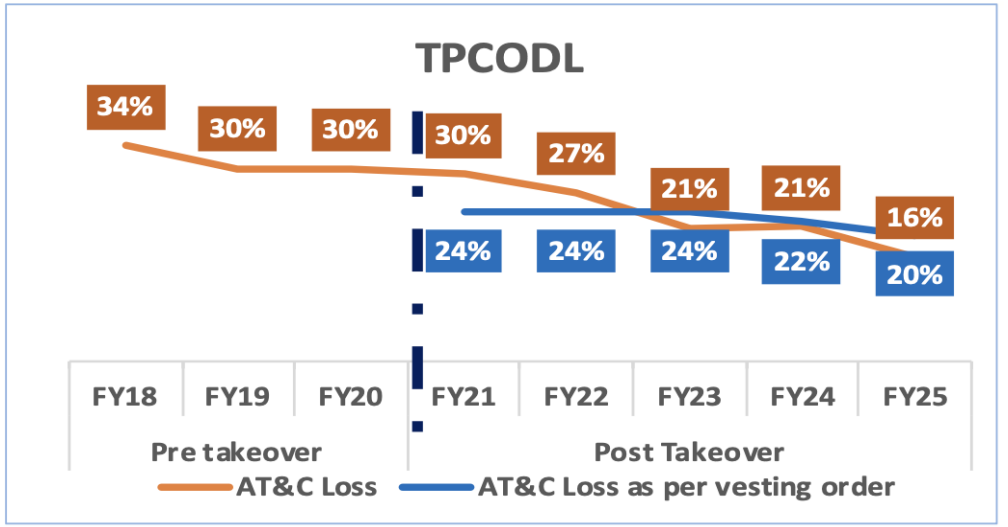


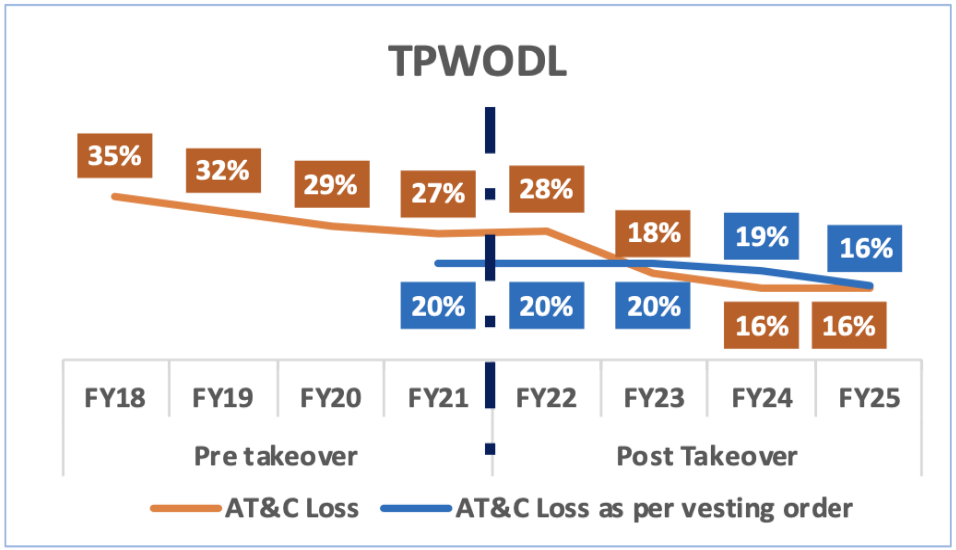


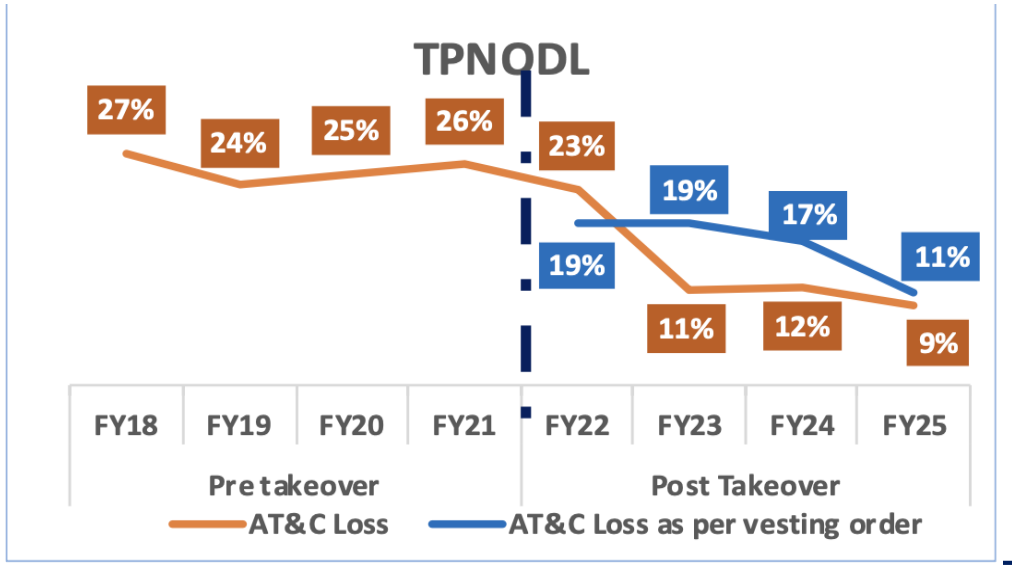


Key Achievements (2/2)









Commercial Turnaround – Initiatives & Enablers

Metering

New Connections Addition

Replacement of Defective Meters

100% compliance with statutory meter testing

Conversion of Unmetered to metered

Smart Metering

Billing

Addressing Provisional Billing and

Unbilled cases scenario

Technology infusion to reduce Suppressed reading and Tabletop Reading

Implementation of OCR for Meter Reading

Spot Billing

Collection

QR Code based payment

Arrear collection Drives through Ex-Servicemen, Bike Squads & DC Squads

100% Online Cash Collection through "Sangrah" Mobile App

Focused Recovery from Rural Areas through Gram Panchayat Level collection Teams

Operation "Clean Slate" - liquidate the arrears in urban areas

m-POS for Spot Collection deployed.

Rural Electrification

Gaon Chalo Camps & Establishment of Bidyut Seva Kendra to increase outreach for rural consumers

Mission Cheetah to bring unbilled consumers to billing net

Structural Reforms (Accountability & Reach)

Circle- Introduction of HoD/HoG-Comm

Division - Introduction of CSM,TL-MBC,CRE,MMG & ENF

Section - Introduction of JM-Comm. & CCE.

Technology Adoption – Network Expansion/Modernisation

SCADA & Automation	Geographical Information System	Smart Metering	ERP System	Advanced Distribution Management System	Remote & Online Monitoring
Central Power System control	Consumer indexing	Transparency of usage	Finance, MM, HR integration – PMS, BAMS	Integrated distribution planning for growth, operations	Use of Thermovision scanners for online inspection
Automation of sub-stations	Asset mapping including network trail, MRU, Energy Audit	Remote monitoring and controlling for energy management	Billing system integration, mapping of 100% consumers for CRM and Billing	Predictive operations	Drones for tower and feeder maintenance
Real time remote monitoring and operations	Network planning based on GIS	Drone based meter reading of Bluetooth meter		Optimized Grid Operations.	Field Force Applications – OCR, MMG, ENF, DO, Suraksha Kavach.
Eliminating Human intervention	New connection based on GIS				

Effective HR Deployment

1 — Priority to recruitment from State

Campus recruitment only from Colleges of State
Preference to State based candidates

2 — Stagnation Promotion Policy

1086 out of 1844 OSCR employees promoted under Stagnation Promotion Policy

3 — Recruitment Policy for spouse & ward

Introduced recruitment policy for spouse and ward

4 — Conducive working environment

Renovation of more than 80% offices , 100% Executives provided laptops, Training & Development

5 — Group Health Insurance Policy

Policy for employees and family : ₹ 5 Lakhs/ ₹ 7 Lakhs, Top up upto ₹ 15 Lakhs

6 — Annual Health Check Up

Annual Health Check up for all employees

7 — Enhanced Fuel Allowance

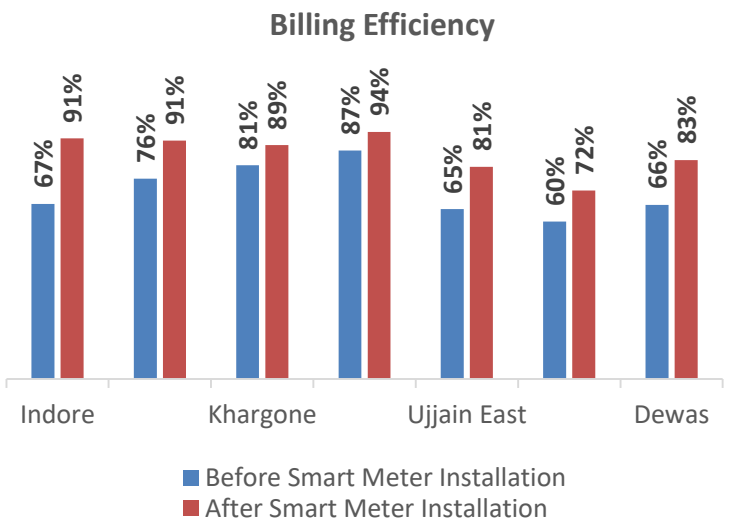
Enhanced fuel allowance for Executive Employees

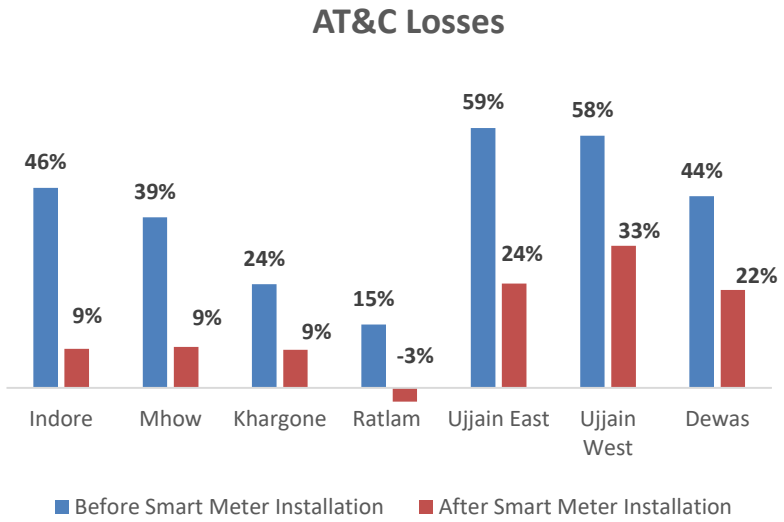
8 — Inclusivity

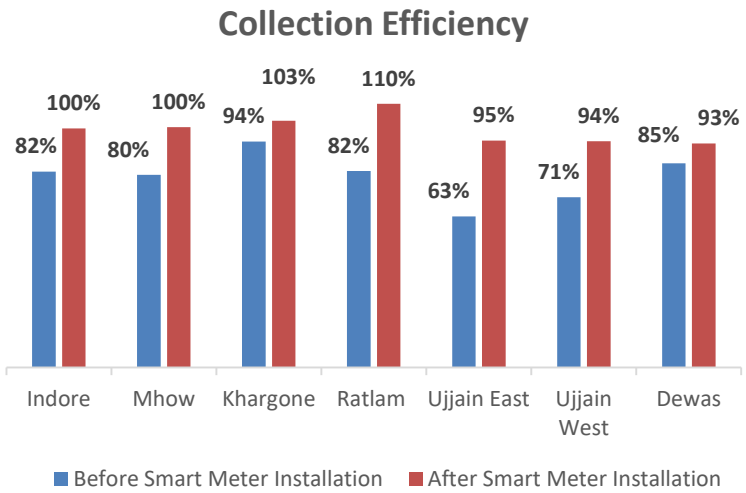
Onboarded
- Ex-servicemen
- Women Self Help Groups

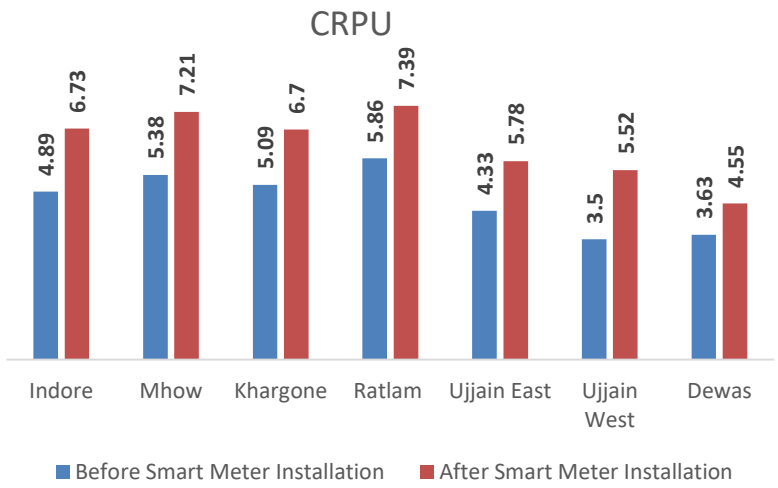
Madhya Pradesh Paschim Kshetra Vidyut Vitaran Company Limited

Key Achievements – Smart Metering Benefits









Improvement in Sales and Revenue Billed	Average Monthly Units Billed improved by 13.63% and, Average Monthly Per Consun current bill improved by 21.46
Aberrations Reported	Total 18196 cases identified le to additional billing of Rs 21.9 Crores
Recovery against MD> SL for <10kW consumers	More than Rs. 8.39 Crores recovered accurate recording MD
PF Penalty and Incentive	**PF Penalty** imposed to 2.43 La bills amounting to Rs. 7.46 Cr **PF Incentive** to 4.89 Lakhs bil amounting Rs 25.68 Cr.
Remote Reconnections and Disconnections	6.57 Lacs successful remote R of around Rs 308.63 Cr on arre
Smart Meter to Net Meter	3707 Smart Meter converted i Net meter with connected loa MW

Strategies – Initiatives – Performance Improvement

Improvement in Sales and Revenue through effective implementation of **Smart Metering**

Effective Vigilance Enforcement Activity through NVIS

Door to Door Revenue Collection with on-the-spot receipts through Mobile App

System strengthening work carried out through various projects and SSTD scheme

Monitoring of **feeder wise RPU and area specific strategy for RPU** improvement

Providing **irrigation power supply during off-peak period as a DSM measure**.

Special drive for old arrear recovery through Japti/Kurki and seizer of bank accounts

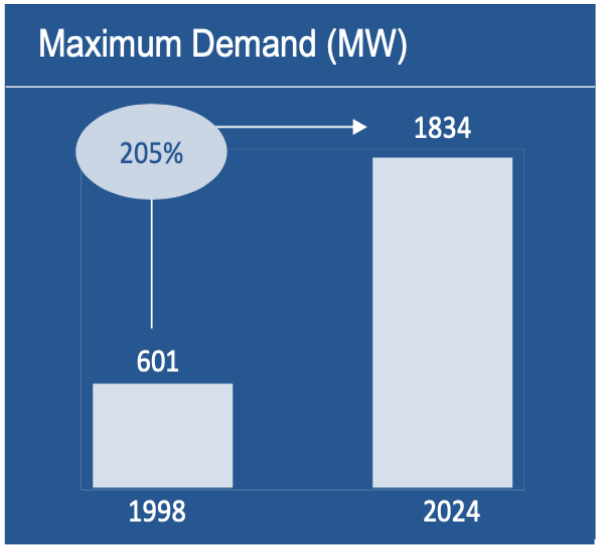
Augmentation of overloaded PTRs/DTRs and shifting of DTRs at load center

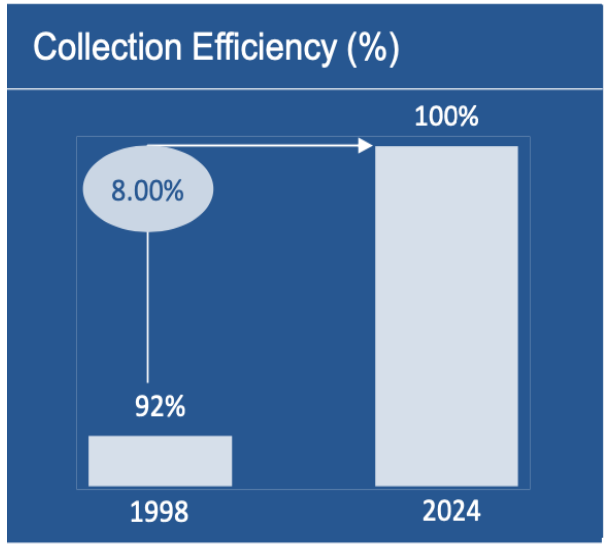
Employee Motivation

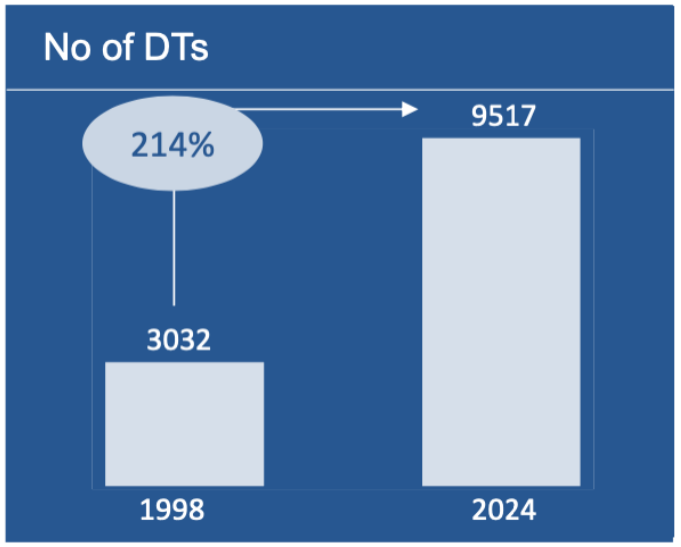
- **Free Health Checkup :** Under the umbrella of AROH, West Discom conducted a comprehensive health initiative – the 'Health Check-Up Camp.
- **Sona Chandi scheme :** West Discom motivates its employees under its appreciation schemes like Sona Chandi scheme under which (SE, EE, AE, JE) received certificates, gold and silver coins, for highest revenue collection, AT&C loss reduction, CRPU improvement and FRT bill collection.
- **Safety Training:** West Discom have nominated 100 technical staff for imparting refresher training program at the Central Training Institute in Jabalpur.
- **Training & Employee recognition:** West Discom have nominated 100 technical staff for imparting refresher training program at the Central Training Institute in Jabalpur.

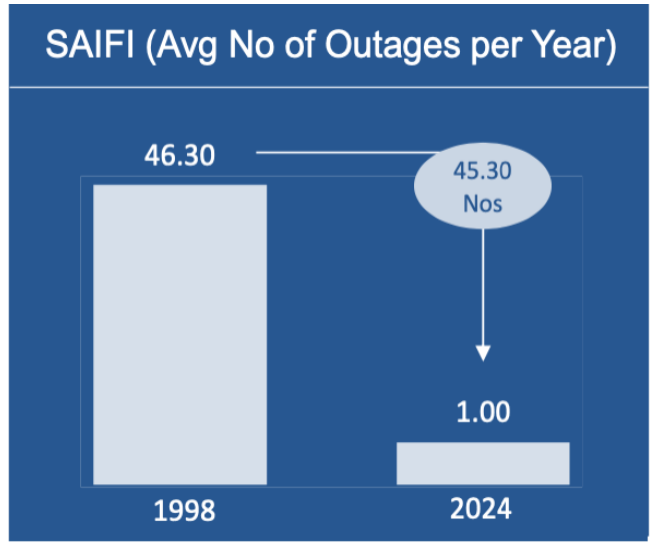
Torrent Power - Ahmedabad

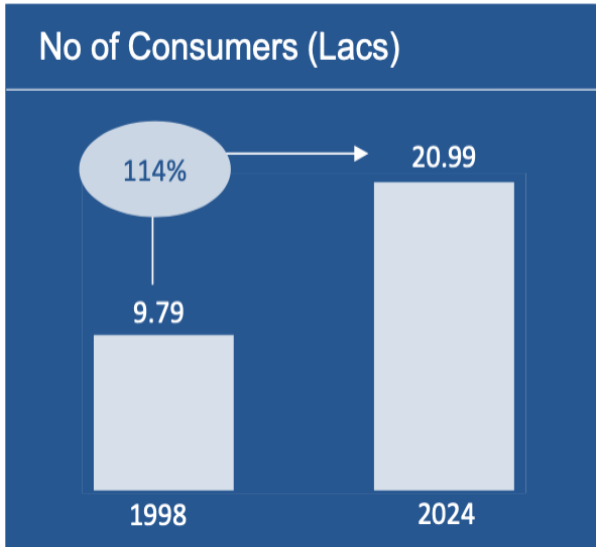
Key Achievements

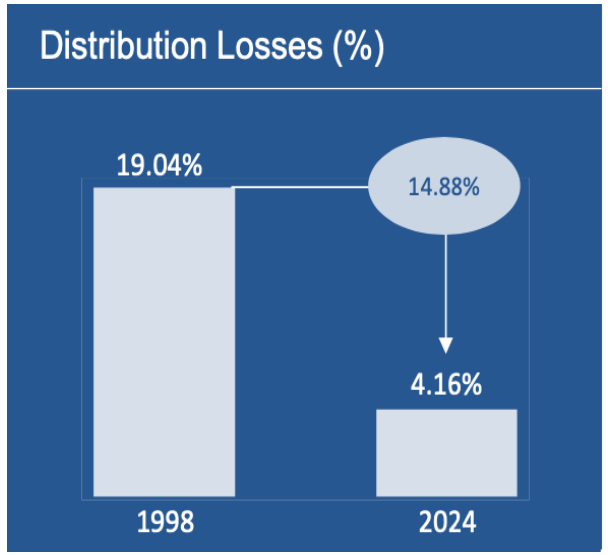


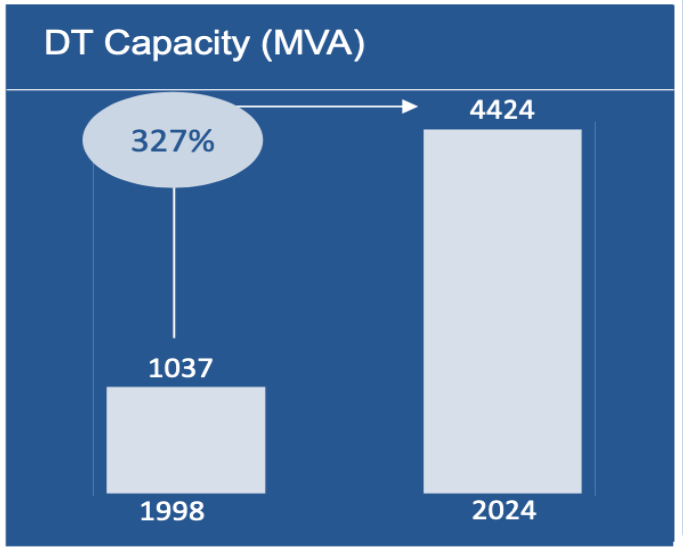


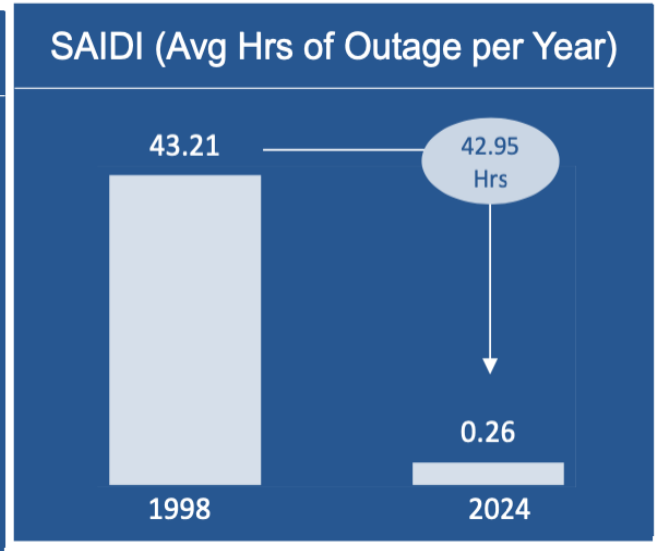




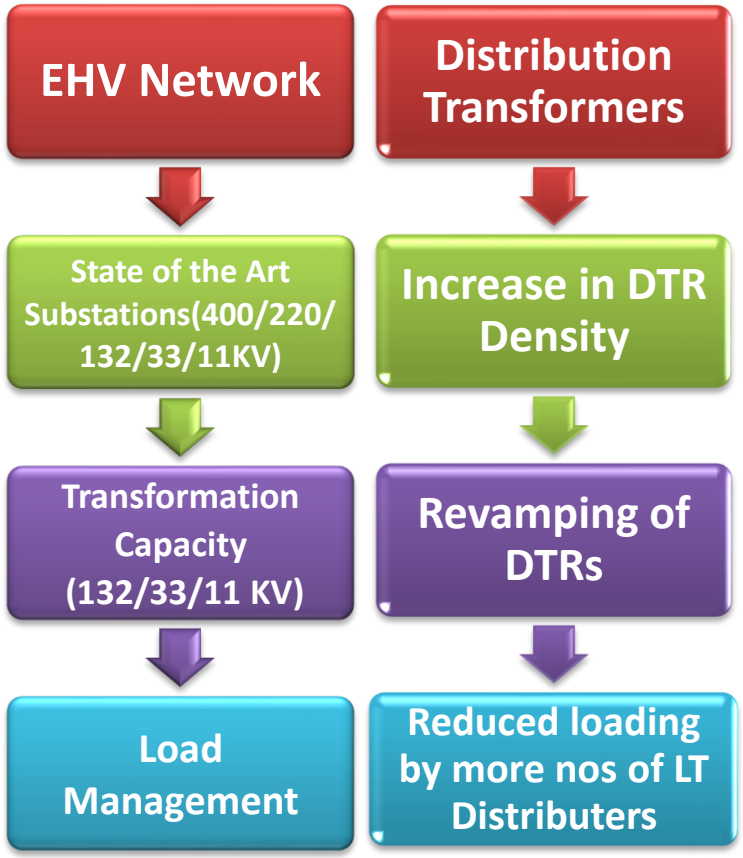


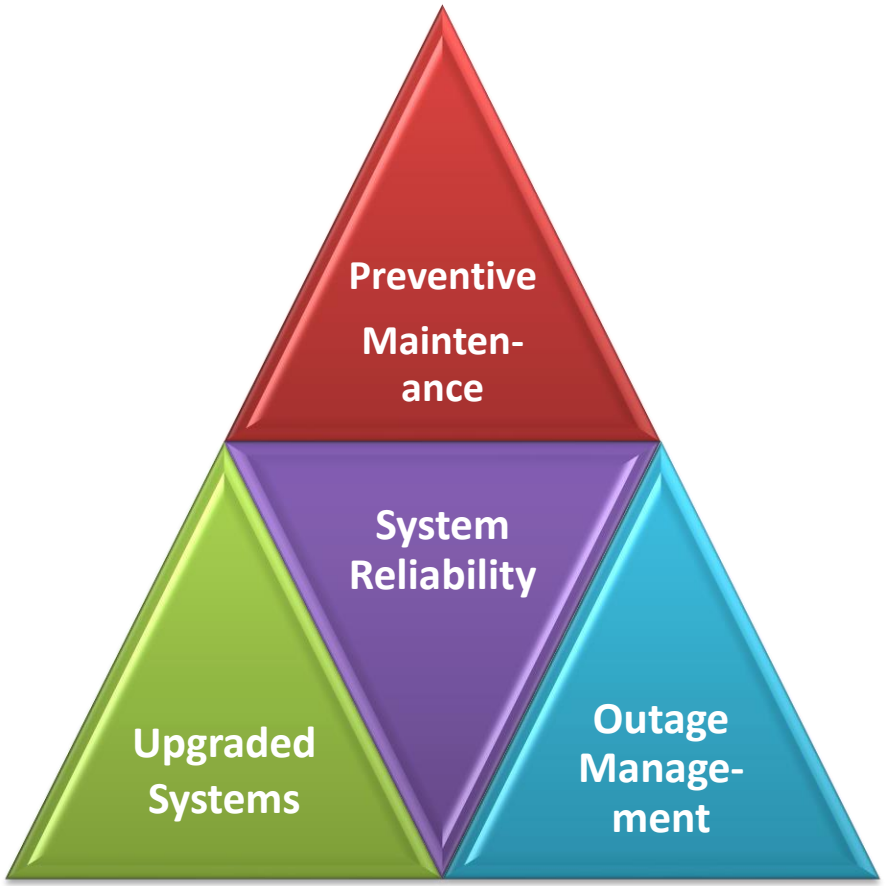






Key Measures (1/2)



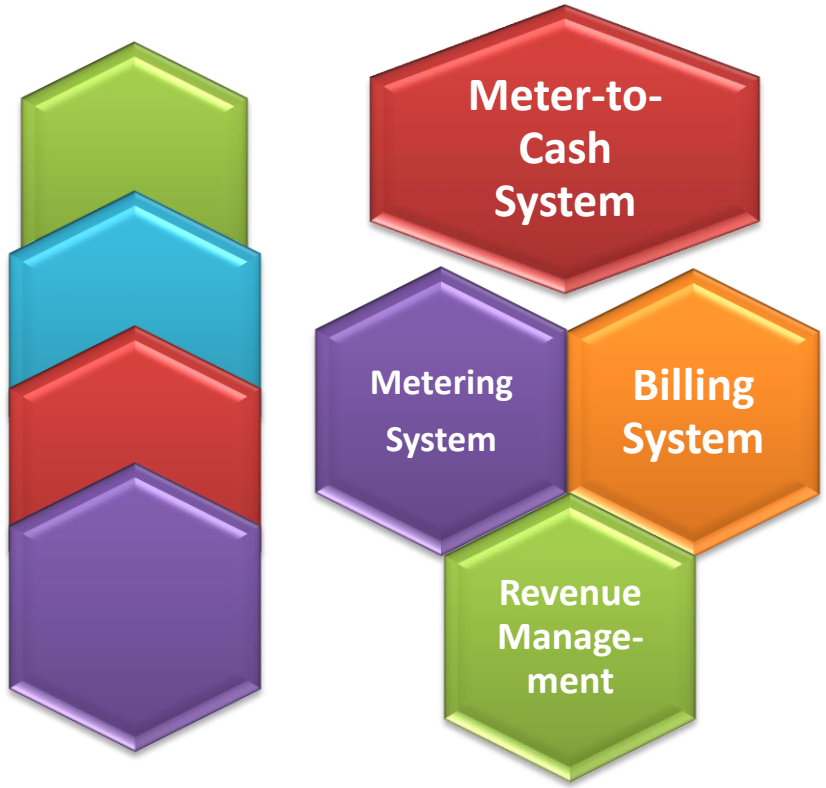


IT Integration

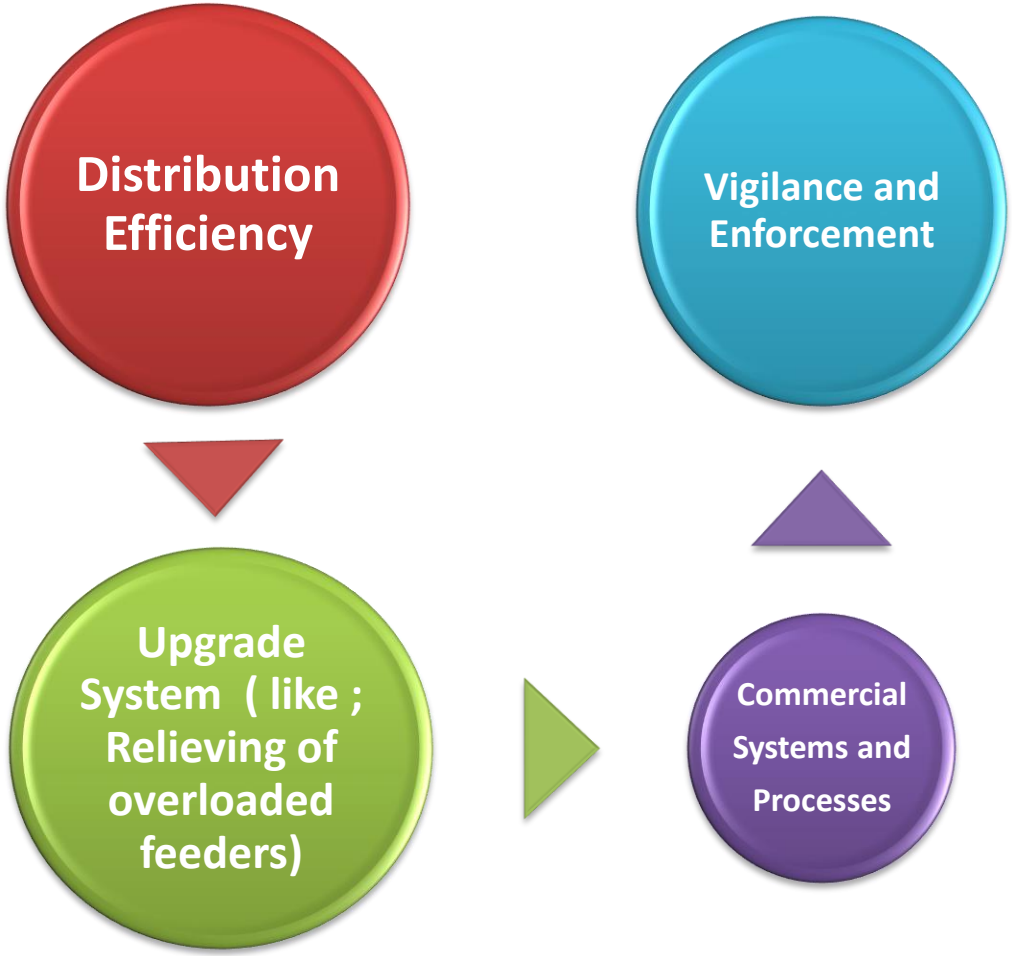
Network Augmentation

System Reliability

Key Measures (2/2)



Meter to Cash



Distribution Efficiency

Distribution Business Turnaround Strategy adopted by Torrent - Summary

Reliability & Quality of Supply	Customer Services	System Efficiency
• Mitigate the power shortages • Capacity addition • Revamping distribution network • Better load monitoring and Management • Conversion of overhead networks by underground network • Condition Monitoring System	• Customer Relationship Management System • Outage Management • 24 x 7 Call Center • Customer Convenience Center • Transparent and Customer-friendly procedures • Extended working hours	• Identifying areas of leakages • Robust Meter-to-Cash System • Accurate Metering and Defective Meter Replacement • Revenue Protection and Assurance system • Expediting legal connections / load extensions
• Reliability Indices / Parameters • Redundancy at 33KV & 11KV • Repeated failure of UG networks • Repeated Fuse-off Complaint	• No of metering complaints • Performance targets • Extent of IT Implementation • Customer Perception Index	• Accuracy of meters • No of DTs with high losses • DOE Cases • Network loading

Torrent Power - Bhiwandi

Key Achievements

Till Jan 2007	UoM	Parameters
1.30	Lacs	Customer base
48.60	%	T&D Loss
68.29	%	Collection Efficiency (incl. Subsidy)
64.90	%	AT&C Loss (incl. Subsidy)
75	%	Power Availability
383.30	Nos.	HT SAIFI
201.60	Hrs.	HT SAIDI
40.00	%	DT Failure Rate
46	Nos.	No. of Feeders
754	MVA	Distribution Tr. Capacity
10.23	Rs. Cr.	CAPEX - Cumulative
650	MVA	Power Tr. Capacity

Situation till January 2007 (Takeover)

Situation as of FY 2023-24

Parameters	UoM	FY 2023-24	Variance (%) w.r.t takeover
Customer base	Lacs	3.95	↑ 203.85
T&D Loss	%	9.64	↓ 38.96
Collection Efficiency (incl. Subsidy)	%	100.41	↑ 32.12
AT&C Loss (incl. Subsidy)	%	9.27	↓ 55.63
Power Availability	%	99	↑ 25
HT SAIFI	Nos.	33.93	↓ 91.15
HT SAIDI	Hrs.	33.32	↓ 83.47
DT Failure Rate	%	0.74	↓ 39.22
No. of Feeders	Nos.	109	↑ 137
Distribution Tr. Capacity	MVA	1,355	↑ 80
CAPEX - Cumulative	Rs. Cr.	1,128.02	-
Power Tr. Capacity	MVA	1,085	↑ 67

Major Initiatives Taken

Strengthening Network Efficiency and Reliability

- Modernizing Infrastructure - Outdated, theft-prone networks were eliminated, and overhead lines were converted to underground systems.
- Enhancing Network Protection - Cable safeguarding measures and the introduction of Medium Voltage Covered Conductors (MVCC) improved reliability and reduced faults.
- Adopting Cutting-Edge Technology - Advanced systems like SCADA, RMUs, Auto-Reclosures, IoT-enabled Transformer Monitoring Units, and Fault Passage Indicators (FPI) were deployed to enhance network performance.

Transforming Metering, Billing, and Consumer Management

- Improved Metering Accuracy - Focused on metering upgrades and replacements to enhance billing efficiency.
- Legalizing Unauthorized Connections - The Ujjwal Bhiwandi Abhiyan (UBA) successfully transitioned 1.25 lakh illegal connections into legal frameworks.
- Data-Driven Monitoring - Feeder-level loss tracking, theft deterrence, and integrating illegal consumers into billing systems were prioritized.

Operational Excellence and Rural Outreach

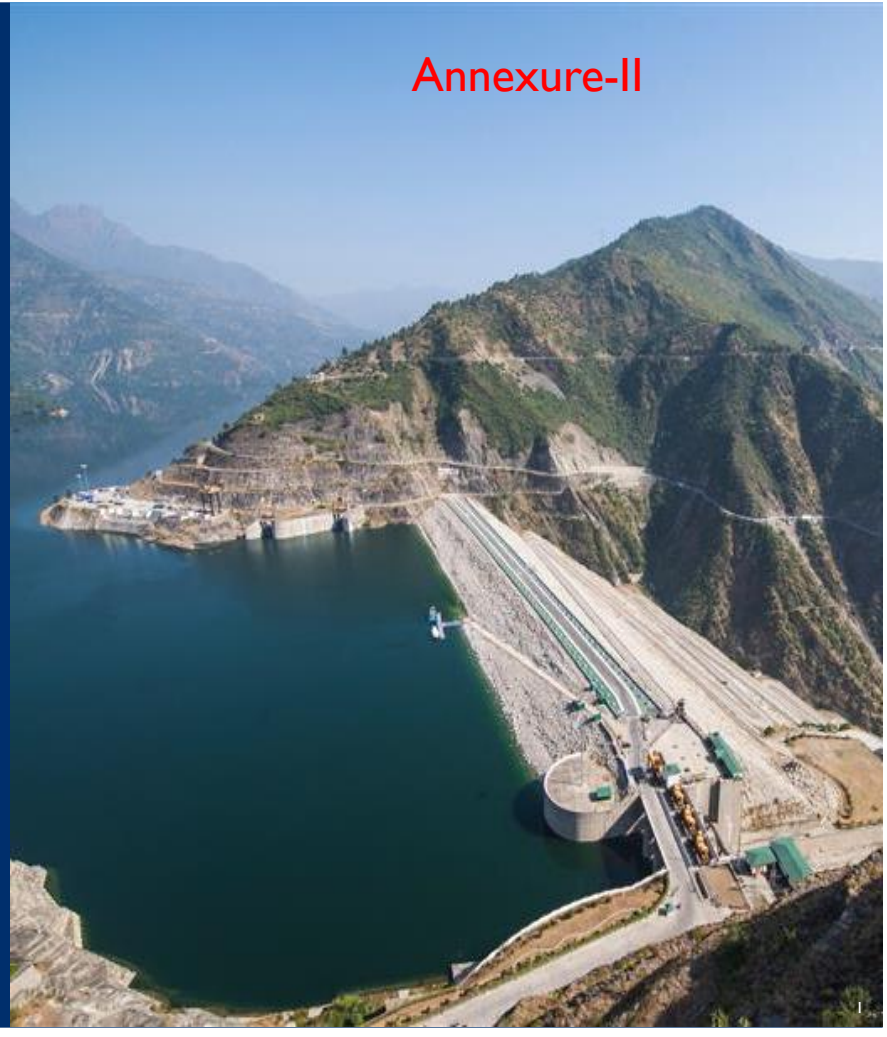
- Streamlining Operations - Digital tools such as Field Force Applications (FFA) and digital mapping systems improved operational efficiency.
- Expanding Rural Accessibility - Mobile energy bill collection vans were introduced to ensure service accessibility in rural areas.
- Quality Assurance Measures - An NABL-accredited Meter Testing Laboratory was established to uphold precision and standards in metering equipment.

Annexure-II

94th Meeting of the Forum of Regulators

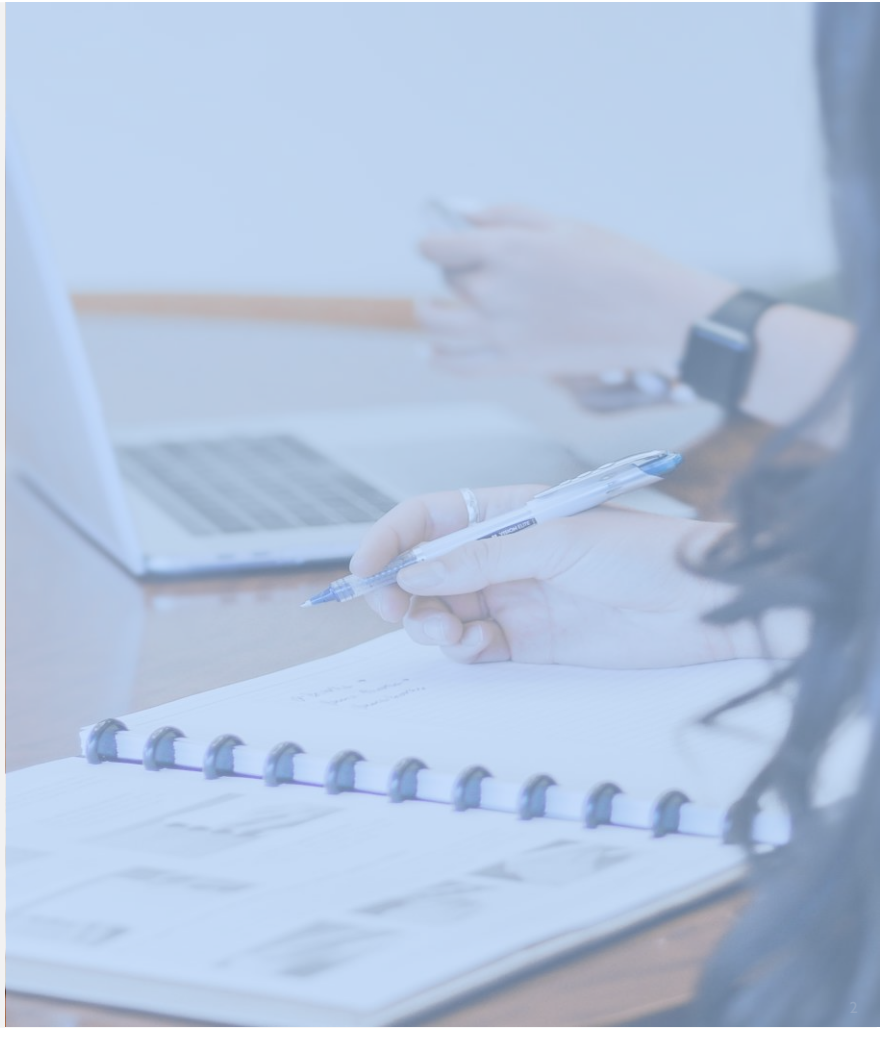
Status Update of FOR Working Group on "Accelerating the Development of Hydropower and Pumped Storage Project for Grid Stability in India"

January 10, 2025



Presentation Outline

- Context
- Progress so far
- Highlights of the WG meetings
- Discussion on the ‘Recommendations of the Working Group’



Context

Objective of WG: To identify and mitigate emerging issues that hinder the development of hydropower resources, including pumped storage Projects in India

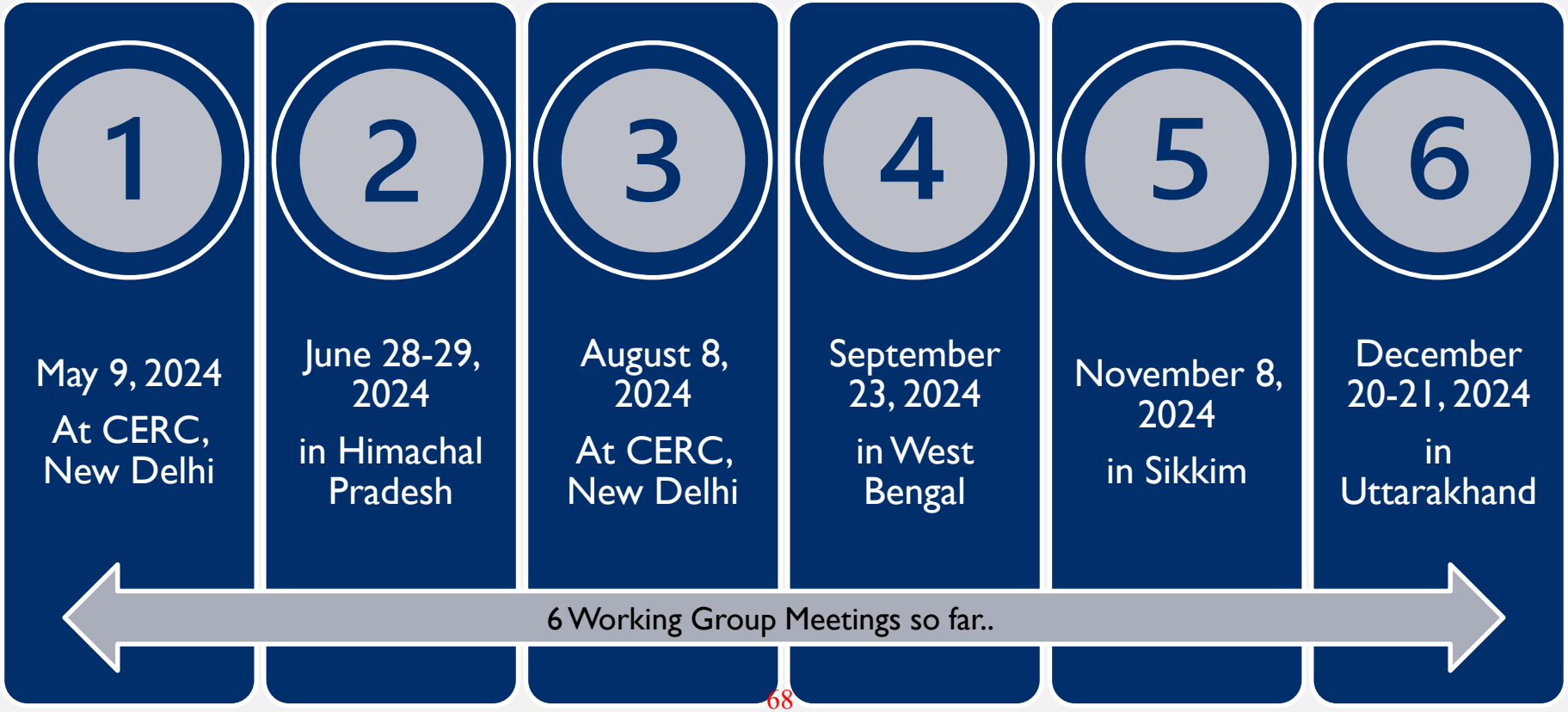
1. Evaluate the current regulatory framework, policies and practices governing hydropower development and identify any difficulties
2. Explore measures aimed at encouraging the development of hydropower resources, including pumped storage projects, within the country
3. Suggest strategies and mechanisms for accelerating the harnessing of hydroelectric and pumped storage potential.
4. Any other matter related and incidental to the above

Scope of the working group 67

Constitution of FOR Working Group

- Chairperson, HPERC - Chairperson of the WG
- Chairperson, AERC - Member
- Chairperson, APSERC - Member
- Chairperson, CSERC – Member
- Chairperson, KERC - Member
- Chairperson, MERC – Member
- Chairperson, PSERC - Member
- Chairperson, SSERC - Member
- Chairperson, UERC - Member
- Chairperson, WBERC - Member
- Chairperson, UPERC - Member

Progress so far...



Highlights of 1st WG Meeting

- The 1st WG meeting was held on May 9, 2024, at CERC, New Delhi
- Following key topics were discussed:
  - Overview of the status of Large Hydro, Small Hydro, and PSP in India
  - Barriers, risks, and mitigation strategies associated with hydropower development

Highlights of 2nd WG Meeting

- The 2nd WG meeting was held on June 28 and 29, 2024, in Chail, HP
- Following key topics were discussed:
  - Development of Hydro power and means to accelerate harnessing hydro potential (including pumped storage) in India - Presentation by SJVNL
  - Case study of Purulia Pump Storage Plant - Presentation by WBERC
  - Status of development of hydroelectric and PSP projects in other countries - Presentation by consultants assisting the WG
  - Preparation of a questionnaire to identify and analyze the key issues faced by hydro developers in India

Highlights of 3rd WG Meeting

- The 3rd WG meeting was held on August 08, 2024, in FOR Secretariat, New Delhi
- Following key topics were discussed:
  - Views and experiences on policy issues, issues related to clearance of projects, tariff, future recommendations, etc. - Presentation by JSW Energy and Greenko
  - Identify best practices from USA and China and develop specific recommendations for adoption in India - Presentation by Consultants assisting the WG
  - Questionnaire Structure:
    - Policy Issues
    - Issues related to Clearances and preparation of DPR (Pre-planning phase)
    - Selection of Developer & Contractor
    - Determination of Tariff
    - Development of Project
    - Execution of Projects
    - Attributes/Services Offered by Hydro and PSP
    - Outlook and Recommendations

Highlights of 4th WG Meeting

- The 4th WG meeting was held on September 23, 2024, in Purulia, West Bengal
- Following key topics were discussed:
  - Views and experiences on Policy issues, issues related to clearance of projects, tariff, future recommendations; experience on Hydro and PSP, etc. - Presentation by DVC and WBSEDCL
  - Discussion on the responses to the questionnaire

Highlights of 5th WG Meeting

- The 5th WG meeting was held on November 08, 2024, in Gangtok, Sikkim
- Following key topics were discussed:
  - Discussions on Scheme of Central Financial Assistance (CFA) towards equity participation by the State Governments for the development of Hydro Electric Projects in the North - Eastern Region
  - Views and experiences on policy issues, issues related to clearance of projects, tariff, future recommendations; experience on Hydro and PSP, etc. - Presentation by NHPC
  - Discussion on the responses to the questionnaire

Highlights of 6th WG Meeting

- The 6th WG meeting was held on December 20-21, 2024 in Uttarakhand
- Following key topics were discussed:
  - Business Models for PSP
  - Utilization of Pumped Storage Projects as a Grid Asset
  - Scheme for Budgetary support for enabling Infrastructure for Hydro Projects
  - Presentation by THDC on impediments hindering development of Hydropower Projects

Number of responses received

1. Greenko Group
2. Bhakra Beas Management Board (BBMB)
3. Maharashtra State Power Generation Company Limited (MSPGCL)
4. Himachal Pradesh State Electricity Board Limited (HPSEBL)
5. Adani Green Energy Limited (AGEL)
6. JSW Energy limited
7. Tata Power Company Limited
8. NHPC Limited
9. Jindal Steel and Power Limited
10. SJVN Limited
11. Devi Energies Private Limited
12. Malana Power Company Limited

12 responses

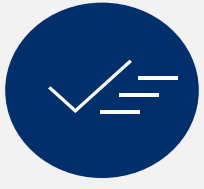
RECOMMENDATIONS OF THE WORKING GROUP

Recommendations

For Policy Reforms

For selection of Contractors

For Tariff determination



For Project Execution

For preplanning phase

For selection of developers

To fast pace project development

For monetization

Major Recommendations for Policy Reforms

Creation of Single window system for clearance: Can significantly streamline the approvals, and expediting project development by reducing delays. (It can be integrated in National Single window system for all the approvals)

Land Acquisition: For Hydro projects, river valleys and areas above tunnel alignment should be excluded from CA land calculations, as 25-30% of forest land required for project construction often falls within the river course.

Carrying Capacity Study Requirements: Work may be carried out by an Empowered committee on Hydro for all river basins.

Support by the States in getting NOCs for Forest Clearance and from Gram Sabha

Consideration of Off-stream Pumped storage Project under White Category

Major Recommendations for Preplanning phase of projects

Single agency for DPR preparation to project development (Creation of SPV similar to UMPP): Creating a SPV framework for Hydro and Pumped Storage Projects (PSPs), similar to the UMPP model for thermal plants

Creation of checklist for each responsible agencies with its timeline: A comprehensive checklist be developed for each responsible agency, with clearly defined timelines for each stage of the clearance process.

Creation of Private testing agencies for all the tests approval: to allow the creation of private testing agencies or accredited third-party labs to conduct the required tests for the approval of DPRs, similar to practices seen in other industries.

Creation of Zone-wise directorate for each government agency: Each regional directorate would be responsible for reviewing the DPR chapters and conducting the necessary scrutiny before forwarding the recommendations to the Empowered committee on Hydro for final approval.

Major Recommendations for Selection of Contractors

Use of Quality-Cost-Based Selection (QCBS) Model: QCBS mechanism should be adopted for selecting contractors for hydro and PSP projects.

Incentives for Timely Completion: Contractors should be incentivized with performance-based bonuses for completing projects ahead of schedule or meeting key milestones ahead of time

Strengthening the Contract Monitoring and Compliance Framework: Robust monitoring and compliance framework should be set up to track contractor performance during the project lifecycle

Dispute resolution process: An empowered committee to settle contractual claims quickly and to ensure that work is not held up for any contractual dispute

Empanelment of Pool of Contractors and Capacity Building: Govt. may empanel a pool of contractors and initiate a capacity-building program for contractors and OEMs. OEMs need to be encouraged to establish manufacturing capacities in India

Major Recommendations for Selection of Developers

Transparent bidding mechanism for the selection of developers for projects identified by the Government

Selection process should evaluate developers based on a comprehensive set of criteria, including technical capability, financial strength, experience in similar projects, and regulatory compliance

Consideration of Technical Expertise and Experience in Hydro/PSP Projects

Major Recommendations for Tariff Determination

Increase in Useful life of the project from 40 years to 50 years: The useful life of hydro power plants can reasonably be extended to 50 years, as these projects are often capable of operating beyond 40 years without requiring major Renovation & Modernization (R&M).

Increase in expenditure towards developing local infrastructure in the vicinity of the power plant: The current expenditure limit of ₹10 lakh/MW, as stipulated in the CERC regulations, may be increased to at least ₹20 lakh/MW or allowed on an actual basis as part of the capital cost.

Major Recommendations for fast pace project development

Use of Digital Monitoring Platform: Implementation of advanced digital platforms (e.g., GIS-based systems, real-time data tracking) is crucial for enabling constant monitoring of key project parameters, such as land acquisition, environmental clearances, construction timelines, and grid connectivity. MoRTH has implemented it.

Frequent Progress Reviews: Implement a structured framework for monthly or quarterly project reviews involving all stakeholders, including developers, contractors, and regulatory bodies. These reviews will ensure regular monitoring, address bottlenecks promptly, and facilitate better coordination to keep the project on track.

AI and Predictive Analytics: Leveraging AI and predictive analytics can significantly enhance project management by identifying potential risks, such as geological challenges or construction delays. These technologies can generate early warning signals, enabling timely interventions and ensuring smoother execution of hydro and PSP projects.

Centralized Data Repository: Establishing a centralized repository can enhance project coordination and transparency. This repository should include real-time updates on construction progress, regulatory approvals, and any changes to the project scope or timeline, facilitating better decision-making and accountability.

Major Recommendations for project Execution

Contractual and Risk Management Framework: Establishment of a strong contractual framework that defines roles, responsibilities, and deliverables for all parties involved

Establishment of Project Monitoring Mechanism: It should include regular progress reports, milestone reviews, and performance assessments. Utilization of digital tools and real-time data collection methods to monitor project execution and identify potential delays or issues early.

Major Recommendations for Monetisation of Hydro/PSP Projects

Providing Ancillary Services: Currently, Central Public Sector Undertaking (CPSU) hydro plants provide Secondary Reserve Ancillary Services (SRAS) support to the grid. This provision can be extended to State hydro projects as well, enhancing grid reliability and stability.

Promotion of Hydro Tourism in Reservoirs of Hydro and PSP Plants: Encouraging recreational activities such as boating, fishing, and nature tours around the reservoirs of hydro and pumped storage plants can attract tourists and local visitors, creating opportunities for additional revenue and enhancing community engagement.

Sale of extracted sediments from reservoir areas: Extracting sediments from the reservoir beds of hydro and pumped storage plants presents an opportunity to generate additional revenue. Once processed, the extracted sediments can serve various purposes, including soil conditioning, use as construction material, and as a raw material for manufacturing products such as bricks and tiles.

Thank you