MINUTES OF 93rd MEETING OF FORUM OF REGULATORS (FOR)

Venue	**: Indore**
Date /Day	**: 13th September 2024; Friday**
Time	**: 10:30 am**
List of Participants	**: Appendix-I**

1. At the outset, the Chairperson of Madhya Pradesh ERC, Shri S.P.S. Parihar, greeted the members and expressed gratitude to the Forum of Regulators (FOR) for accepting their request to host the 93rd FOR Meeting in Indore, which is a hub for renewable energy, including solar, wind, and hydro. He highlighted that significant progress has been made in Madhya Pradesh's distribution sector, including advancements in smart metering, consumer interfaces, and loss reduction. He also added that research on the segregation of technical and commercial losses as well as the reduction of harmonics at both the system and consumer levels, is also progressing well.

2. Chairperson FOR/CERC, Shri Jishnu Barua, in his opening address, warmly welcomed the members to the meeting and thanked the Chairperson, MPERC, for the arrangements made and the hospitality extended. Shri Barua remarked that Madhya Pradesh has indeed been a trailblazer in e-reverse bidding, significantly reducing the per-unit cost of solar and other renewables to sustainable levels, a practice that is now being emulated in transmission as well. Furthermore, Shri Barua outlined the agenda for the day and highlighted the dissolution of the Joint Electricity Regulatory Commission of Manipur and Mizoram, leading to the establishment of two new independent Electricity Regulatory Commissions. He also welcomed Shri Benjamin L. Tlumtea, interim Chairperson of the new ERC of Mizoram who was attending the 1st meeting of FOR after taking charge. He also expressed his appreciation to Justice Nagarjuna Reddy, Chairperson of Andhra Pradesh ERC, and Shri Sriranga Rao, Chairperson of Telangana ERC, for their valuable contributions to the Forum, as they were attending their last FOR meeting before demitting office.

AGENDA ITEM 1: CONFIRMATION OF MINUTES OF THE 92ND FOR MEETING HELD ON 29TH JULY 2024

3. Joint Chief (RA), CERC apprised the Forum about the action taken on the previous meeting held on 29th July 2024 after which the Forum approved the minutes

AGENDA ITEM 2: BEST PRACTICES IN THE ELECTRICITY SECTOR IN MADHYA PRADESH - PRESENTATION BY MADHYA PRADESH ENERGY DEPARTMENT

4. Additional Chief Secretary, Energy, and NRE department, Govt of Madhya Pradesh, Shri Manu Srivastava, made a presentation **(Annexure-I)** on the best practices in the Electricity sector in Madhya Pradesh. The salient features of the presentation were as follows:
    i. Aspects of Resource Planning: According to the Solar bidding guidelines (August 3, 2017), bids can be based on power or energy. The Madhya Pradesh (MP) Energy Department follows an energy-based bid, differing from other State power companies. In a twin procurer arrangement (e.g., DMRC/Indian Railways), optimal scheduling allows a higher capacity utilization factor (CUF) or a flatter supply curve, providing one procurer with consistent supply without extra charges.
    ii. Madhya Pradesh achieves synergy by utilizing complementarity of renewable energy resources and energy demand across States
5. Thereafter, Dr. Priyanka Paliwal, Associate Professor, Department of Electrical Engineering, Maulana Azad National Institute of Technology, Bhopal, made a presentation (Annexure-II), salient features of which are as follows:
    i) Solar inverters can be utilized for both active and reactive power in decentralized solar generation. They can be modified so they can inject both active and reactive power, reducing the strain on the transmission network and eliminating the need for capacitor banks traditionally used for reactive power management.
    ii) A study has revealed that solar inverters, especially during low voltage conditions, perform better than capacitor banks, and this could increase solar generator capacity utilization and revenue while improving grid voltage and reducing losses. By optimizing voltage conditions, solar generators can avoid inverter shutdowns during low

voltage, thus increasing capacity utilization.

6. Representatives of MPPKVVCL made a presentation **(Annexure-III)** with the following key points:

i) MPPKVVCL initially faced issues such as low billing and connection efficiency, manual reading, and a lack of effective disconnection methods, due to which they introduced smart meters, which allow scheduled readings, remote disconnection/reconnection, time-based energy usage tracking, and theft alerts. It was highlighted that this system improves billing accuracy and consumer load control, with data sent securely to a cloud-based infrastructure for management and analysis.

ii) Key components of this system include smart meters, communication infrastructure, and Meter Data Management (MDM) system, which processes and analyses large amounts of data. While Smart meters provide five types of data—instantaneous, load survey, daily profile, billing, and event data, the MDM system conducts three types of analysis: consumption, event, and logic-based analysis, helping to detect tampering and theft.

iii) A pilot project on smart meters in Indore successfully reduced theft and tampering, leading to increased billing accuracy, loss recovery, and improved energy efficiency reducing subsidy brackets for low-energy consumers.

7. The Forum appreciated the progressive steps taken by the Energy Department and the Discoms of MP.

AGENDA ITEM 3: REFERENCE FROM SERCS

A) GRANT OF GNA-RE STATUS TO APTRANSCO - WAIVER OF ISTS CHARGES - REFERENCE FROM APERC.

8. The Forum was apprised of the reference from APERC concerning the eligibility of APTRANSCO for applying for GNA-RE on behalf of all DISCOMs of Andhra Pradesh as per CERC General Network Access Regulations and their subsequent amendment. It was highlighted that granting GNA RE is crucial for availing the benefit of inter-State waiver for drawl of 7000MW of solar power for which APTRANSCO has entered into the Power Supply Agreement with SECI.

11. Chief (RA), CERC clarified the rationale for excluding DISCOMs and State Transmission Utilities (STUs) from GNA-RE status, highlighting that GNA-RE is introduced for consumers procuring only green power and that DISCOMs purchasing green power are already being granted waivers based on a separate formula. The primary purpose of distinguishing between GNA and GNA-RE is to encourage open-access consumers and bulk consumers to substitute their conventional power with renewable energy power and promote the use of green power by offering incentives, such as a full waiver of transmission charges, for entities relying solely on green power. It was further clarified that the entities connected to ISTS with a separate metering boundary and solely procuring renewable energy, are eligible for GNA-RE as also the corresponding waiver of charges.

B) GST ISSUES OF SERCs AND CERC WITH FITMENT COMMITTEE, GST COUNCIL, AND REVENUE DEPARTMENT -REFERENCE FROM BERC

13. Joint Chief (RA), CERC, apprised the Members of the Forum regarding the GST-related issues of SERCs & CERC and the reference received from Bihar ERC seeking a discussion on this aspect with special reference to the exemption received by RERA.

14. Chairperson BERC apprised the Forum that RERA authorities of all the States had collectively placed their pleadings and arguments before the Fitment Committee and others in the Central Government based on which they received exemption from the Fitment Committee. He suggested the Forum should also take up the issue collectively before the concerned authorities in the Central Government for grant of exemption to all ERCs.

15. Secretary, FOR/CERC apprised the Members of the Forum that both FOR and CERC have been following up with various departments in the Government of India on this issue as also petitions filed by various ERCs, including CERC and agreed that FOR should initiate more action in this matter as suggested by the Chairperson, BERC.

16. After discussion, the Forum decided to constitute a Committee assisted by the

FOR the Secretariat to take further action on this issue:

(i) Chairperson, FOR/CERC - Chairperson
(ii) Chairperson, Bihar ERC - Member
(iii) Chairperson, Karnataka ERC - Member.
(iv) Chairperson, Uttar Pradesh ERC - Member.
(v) Chairperson, Punjab ERC - Member.
(vi) Chairperson, Haryana ERC - Member.

C) WAIVER OF INTER-STATE TRANSMISSION CHARGES ON TRANSMISSION OF THE ELECTRICITY GENERATED FROM SOLAR AND WIND SOURCES OF ENERGY- REFERENCE FROM KSERC

17. Member KSERC mentioned in reference to the waiver of Inter-State Transmission Charges on the transmission of electricity generated from Solar and Wind sources of energy that CERC should direct CTU to stop recovering the cost of waiver of transmission charges from the DISCOMs and other DICs. It was highlighted that there is no logic in recovering the cost of waiver of inter-state Transmission charges allowed to RE projects by the Ministry of Power (MoP) from the financially weak DISCOMs in proportion to their transmission charges and that the cost of waiver of transmission charges allowed to RE projects as per the directions of the Central Government should be borne by the CTU as per the direction of the Central Government. He suggested that CTU may approach MoP for a suitable mechanism for recovery of costs related to the waiver allowed by the Government. It was also informed that DISCOMs in a few States pay significantly higher charges than that based on their GNA share, while DISCOMs in other States have not received the full benefit of waiver for the RE power sourced through the ISTS due to the apportioning system followed by CTU.

18. On the suggestion by some members of the Forum to remove Annexure-III to the 1st Amendment to Sharing Regulations, 2023, which specifies the methodology of calculation of waiver of transmission charges for DICs with GNA and GNA-RE, Chief (RA), CERC pointed out that this could lead to a revenue gap for the TRANSCOs. The members highlighted the spirit of Section 65 of the Electricity Act 2003 which requires the Government to provide subsidy if it wants the tariff for any consumer category to

be lower than that determined by the regulator. On the same lines, in the instant case where the Government of India has extended waiver for RE projects, commensurate compensation should also be provided by the Government. In the absence of such compensation, the whole concept of waiver gets defeated as the burden of the total waiver is allocated back to the discoms based on their access/usage of the interstate transmission system. It was also pointed out that if CERC were to remove the allocation principles of waiver (reference Annexure-III to the 1st Amendment to Sharing Regulations, 2023), the concept of waiver would be rendered redundant unless there is any budgetary support coming from the Government. The members of the Forum also highlighted the distortions being created due to waiver.

19. After discussion, the Forum decided that the Ministry of Power (MOP) be requested to provide a suitable compensation so that waiver of transmission charges does not adversely impact the Discoms. It was reiterated that the Government of India should review the policy of waiver

D) IMPLEMENTATION ISSUES IN AUTOMATIC COMPENSATION MECHANISM UNDER RULE 13 OF ELECTRICITY (RIGHTS OF CONSUMERS) RULES 2020- REFERENCE FROM MPERC

20. Chairperson, MPERC apprised the Forum regarding the difficulties in the implementation of the Automatic Compensation Mechanism under Rule 13 of Electricity (Rights of Consumers) Rules, 2020, in which Rule 13(1) provides for automatic compensation to consumers in the event of default in meeting the standards of performance (SOP), whereas, Rule 13(5) requires affected consumers to register their complaints and claim compensation through an online facility created by the Discom. He further informed that that if a consumer is required to claim compensation through an online portal, as mentioned in sub-rule 5, it cannot be considered as automatic compensation. Chairperson, MPERC further added that implementing automatic compensation would require developing a mechanism to integrate the billing system with the parameters specified in the SOP Regulations, and the Rules do not clearly specify the mode of compensation for parameters that cannot be monitored remotely.

21. After deliberations, it was decided that to achieve greater clarity, a revised formulation of Rule 13, as outlined below, may be forwarded to the Ministry of Power (MoP) for incorporation through suitable amendments to the Rules.

"13. Compensation mechanism. - (1) Consumer shall be automatically compensated for those parameters which can be monitored remotely when it can be successfully established that there is a default in performance of the distribution licensee.

*(2) The Commission shall notify regulations for establishment of mechanism**, including the parameters which are to be considered for automatic compensation,** by the distribution licensee, for automatic payment of compensation amount determined under the provisions of sub-section (2) of section 57 of the Act within six months from the notification of these rules.*

(3) The Commission shall oversee that the distribution licensee designs and maintains its distribution system in such a way that there is a gradual increase in the list of parameters, which can be monitored remotely and for which automatic compensation can be made to the consumer.

*(5) **For those parameters which cannot be monitored remotely, ~~T~~** the distribution licensee, within six months from the date of notification of the regulations by the Commission under sub-rule (2), shall create an online facility on which consumers may register and claim the compensation amount. The information in this regard shall be widely circulated among consumers through appropriate means including mass media, bills, SMS, e-mails or by uploading on licensee's website."*

AGENDA ITEM 4: REFERENCES FROM MOP:

A) ISSUES REGARDING COMMON METHODOLOGY FOR CALCULATING BANKING CHARGES IN MODEL REGULATION FOR GEOA.

22. The Forum was apprised of the reference received from the Ministry of Power regarding the adoption of a common methodology for calculating banking charges as per Model Regulation for GEOA. It was noted that FOR had previously framed the Model

Regulations for the calculation of Open Access charges and Banking charges for Green Energy Open Access Consumers, wherein the banking charges were specified as 8% in kind, and for off-peak TOD slot to peak TOD slot banking, additional charges as may be specified by Appropriate Commission in addition to the banking charges shall be applicable. Subsequently, based on a reference from MoP regarding the revision of the banking charges to 5% in kind and 8% during off-peak TOD slot to peak TOD slot, the issue was discussed in the FOR Working Group on RE Policy, and after detailed analysis and based on the recommendations of the WG, FOR reaffirmed that banking charges as provided in the Model Regulations were appropriate.

23. However, as per the MoP's latest reference, it was observed that some stakeholders have raised concerns before the MoP over the fixed banking charge rate and have requested that the SERCs should be allowed to determine banking charges (both in-kind and monetary) based on State-specific factors for a more accurate cost reflection.

24. In this regard, Chief (RA), CERC suggested that since this issue was previously taken up by the WG on RE Policy, it could be referred back to the same WG to explore various alternatives, including the implications of maintaining banking charges at 8% and the potential financial impact on Discoms.

25. After deliberation, the Forum agreed to refer the issue to the WG on RE Policy and suggest suitable recommendations.

B) CLARIFICATION ON BANKING PROVISIONS OF ELECTRICITY (PROMOTING RENEWABLE ENERGY THROUGH GREEN ENERGY OPEN ACCESS) RULES, 2022

26. As a continuation of the previous agenda item, the members highlighted that the issue of the permissible quantum of banked power had also been analysed by the WG on RE Policy, and based on its recommendations, FOR had forwarded its suggestions to MoP to allow banking of up to a maximum of 30% of total monthly consumption from green sources to balance consumer and Discom interests and encourage investment in energy storage. However, the recent clarification issued by MoP on the permissible banking quantum did not incorporate FOR's suggestions; rather, it is felt that it could prove

counterproductive and may lead to further confusion.

27. Hence, after deliberation the Forum decided that this issue should also be referred to the WG on RE Policy for further analysis and suggesting suitable recommendations.

AGENDA ITEM 5: PARTICIPATION OF INTRA-STATE GENERATING STATIONS FOR PROVIDING SECONDARY RESERVES ANCILLARY SERVICES (SRAS).

28. The Forum deliberated on the need for increased reserves for frequency control, emphasizing that relying solely on ISTS-connected generators is not sufficient and that more participation from intra-State generators is essential for effective frequency management and SRAS.

29. In this regard, representatives from GRID-INDIA delivered a presentation **(Annexure-IV)** on Secondary Reserves for Intra-State Generating Stations. It was highlighted that a regulatory framework similar to the one developed by CERC for SRAS is needed for the intra-State level as this would help facilitate better management and integration of reserves at the State level. SLDC may be responsible for notifying reserve requirements on an annual, weekly or day-ahead basis, and this would help State utilities understand their reserve needs and retention capacity. Additionally, the role of the SLDC in supporting decision-making regarding unit commitment for reserves at the intra-State level was also noted.

30. It was proposed that to start with, a few State generating stations may be allowed to participate in the inter-State SRAS mechanism with the gradual development of the necessary infrastructure and control mechanisms. In this regard, issuance of Non-Objection Certificates (NOCs) to enable the participation of State generators in the SRAS mechanism may be facilitated by respective State ERC.

31. The necessity of implementing Automatic Generation Control (AGC) independently in each State was also highlighted during the meeting, where it was emphasized that the SERCs may develop a comprehensive set of Regulations covering incentive mechanisms, compensation for generators, and the impacts. Additionally, SLDCs need to establish AGC software and control systems in coordination with Regional SLDCs

for a smoother initial setup. SLDCs are also required to issue No Objection Certificates (NOCs) to allow generating companies to participate in the AGC framework.

32. It was noted that Madhya Pradesh, Uttar Pradesh, West Bengal, and DVC are already in the advanced stages of development regarding intra-State participation.

33. After discussion, the Forum noted that once the SERC permits participation of intra-State generators, any associated expenses may be eligible for reimbursement and recommended that all States may encourage this initiative by either framing appropriate regulatory measures or issuing NOCs. Additionally, any small investments necessary for generation may be considered favourably for approval.

AGENDA ITEM 6: STATUS UPDATE ON RPO / SUBSIDY ACCOUNTING

A) BEST PRACTICES ON RPO COMPLIANCE AND SUBSIDY ACCOUNTING

B) FORMATS FOR COMPILING DATA ON RPO / SUBSIDY ETC.

34. The Forum was informed that M/s ABPS Ltd had been engaged on a retainership basis in the FOR Secretariat to carry out the additional tasks assigned to FOR vide the FOR-Amendment Rules 2022. As a part of the assignment, M/s ABPS has prepared formats related to the collection of data regarding reports that FOR is supposed to submit to MoP.

35. Thereafter, the consultant delivered a presentation **(Annexure-V)** on the best practices for subsidy accounting and monitoring RPO compliances across various States. It was highlighted that the methods of subsidy accounting vary significantly from State to State. In some States, the government declares a lump-sum subsidy for the entire financial year, which is then incorporated into the Tariff Order issued by the State Commission (e.g., Goa, Arunachal Pradesh). Secondly, in States such as Andhra Pradesh and Telangana, the government specifies category-wise subsidies during the Tariff Order proceedings, and the State Commission issues two Tariff Orders—one with and the other without the subsidy. Lastly, in other States, after the State Commission issues the Tariff Order, the government specifies the category-wise subsidies in alignment with the approved Tariff Order (e.g., Madhya Pradesh). A notable best practice for quarterly reconciliation of subsidies is being followed in Delhi,

where the Delhi Electricity Regulatory Commission (DERC) appoints a C&AG-empanelled auditor to reconcile quarterly subsidies. This ensures that the subsidies released or adjusted by the Government of NCT of Delhi (GoNCTD) are accurately passed on to consumers in their electricity bills. It was emphasized that if a centralized monitoring system for subsidy accounting and RPO compliance is to be implemented, a common mechanism needs to be developed.

36. In this regard, the Forum was also updated that formats aligned with the Standard Operating Procedure (SOP) mechanism notified by MoP (for compilation on a quarterly basis) have been prepared and shared with SERCs/ JERCs to facilitate uniform data collection on subsidy accounting and RPO compliance. Additionally, ERCs were requested to appoint a nodal officer at their end with whom the FOR Sectt can take up these matters.

37. After deliberation, the Forum noted the presentation and agreed that all Forum Members would appoint nodal officers for this exercise and also forward the required information in the said formats to FOR Secretariat on a timely basis to enable compilation of the same.

C) UPDATE ON DATA REQUIREMENT FOR RPO STUDY UNDER RE POLICY WORKING GROUP

38. The Forum was apprised of its decision in the Special FOR Meeting held on 19th February 2024, wherein it was decided that the FOR Working Group on RE policy should undertake a detailed study for stipulating the norms with regard to RPO trajectory for non-RE rich States based on the market reality and State-specific issues. In continuation, data collection templates were shared with specific States.

39. As an update, it was informed that while data has been received from Assam, Himachal Pradesh, and Bihar ERC, information has not been received from ERCs of Gujarat, Andhra Pradesh, Meghalaya, Odisha, Delhi, Uttar Pradesh, and Chhattisgarh Hence, the Forum once again reiterated the remaining States to share the data with FOR Secretariat to enable the FOR WG on RE Policy to complete the Study.

CONCLUSION

40. Justice C.V. Nagarjuna Reddy, Chairperson, Andhra Pradesh ERC, in his farewell address, cherished his moments as part of the Forum of Regulators and remarked that his five-year tenure was one of the best periods of his life. The brainstorming sessions and the business conduct of the Forum epitomized unity in diversity as a 'Family' of Regulators. He thanked all the members, particularly the Chairperson of FOR/CERC, for their whole-hearted support and the Chairperson of Madhya Pradesh ERC for the warm hospitality extended. He also expressed special thanks to the Secretary of FOR/CERC, Chief (RA), Joint Chief (RA) of CERC, and the Secretariat of the Forum for their assistance.

41. Shri T. Sriranga Rao, Chairperson - Telangana ERC, in his address, acknowledged and expressed deep gratitude for the support he received from the Forum of Regulators. He noted that he always looked forward to the Forum's meetings, as they provided great opportunities to learn about the best practices being followed across the country. He enumerated the key initiatives of the Telangana ERC, which, with the support of the Telangana government, led to tremendous improvements on both the utility and consumer sides. Shri Rao also detailed his Commission's office construction, which is being carried out in compliance with net-zero energy and discharge standards, setting a landmark step for the State of Telangana. He spoke about the great privilege of hosting the 92nd Meeting of the Forum, which was indeed a great honor for the Telangana ERC. He also thanked all his staff for enabling him to discharge his duties to his satisfaction and concluded his address by expressing gratitude to all members and staff of the Forum.

42. Secretary - FOR/CERC, delivering the Vote of Thanks, expressed his gratitude to the members and officers of the Forum of Regulators for attending and extending their support to the meeting. He thanked the Chairperson - Madhya Pradesh ERC and his team for the excellent arrangements and hospitality provided. He also expressed his appreciation to the Chairperson - FOR/CERC for his guidance throughout the meeting. He acknowledged the contributions made by Justice C.V. Nagarjuna Reddy, Chairperson - Andhra Pradesh ERC, and Shri T. Sriranga Rao, Chairperson - Telangana ERC, wishing them all the best in their future endeavors after superannuation. Secretary, FOR also thanked FOR Secretariat for their support to the 93rd Meeting of the FOR.

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Appendix – I

LIST OF PARTICIPANTS OF 93rd MEETING OF FORUM OF REGULATORS (FOR) HELD ON 13th SEPTEMBER 2024

S. No.	NAME	ERC
01.	Shri Jishnu Barua Chairperson	CERC/FOR – in Chair.
02.	Justice (Shri) C.V. Nagarjuna Reddy Chairperson	APERC
03.	Shri R K Joshi Chairperson	APSERC
04.	Shri Kumar Sanjay Krishna Chairperson	AERC
05.	Shri Amir Subhani Chairperson	BERC
06	Shri Hemant Verma Chairperson	CSERC
07.	Shri Mehul Gandhi Member	GERC
08	Shri D.K. Sharma Chairperson	HPERC
09	Shri Alok Tandon Chairperson	JERC for State of Goa & UTs-Online
10	Shri M Rafi Andrabi Chairperson	JERC for UTs of J&K and Ladakh
11	Shri Nand Lal Sharma Chairperson	HERC
12	Shri P. Ravi Kumar Chairperson	KERC
13	Shri S.P.S. Parihar Chairperson	MPERC
14	Shri Sanjay Kumar Chairperson	MERC
15	Shri C.K. Mondal chairperson	MSERC
16.	Shri Benjamin L. Tlumtea Chairperson	Mizoram ERC
17	Shri Viswajeet Khanna Chairperson	PSERC
18.	Dr Rajesh Sharma, Member	RERC
19	Shri K.B. Kunwar Chairperson	SSERC
20.	Shri K. Venkatesan Member	TNERC

21	Shri T. Sriranga Rao Chairperson	TSERC
22	Shri Arvind Kumar Chairperson	UPERC
23	Dr. M.V. Rao Chairperson	WBERC
24.	Shri Gajendra Mohapatra Chairperson In-charge	OERC
25.	Shri Mahendra Prasad Member	JSERC
26.	Shri B. Pradeep Member	KSERC
27.	Shri Harpreet Singh Pruthi Secretary	FOR/CERC
28	Dr. Sushanta Kumar Chatterjee Chief (Regulatory Affairs)	CERC – Online
SPECIAL INVITEES		
29.	Shri Ramesh Babu V Member (Technical)	CERC
30	Shri Harish Dudani Member (Law)	CERC
31.	Shri Gopal Srivastav Member (Law)	MPERC
32	Shri Prashant Chaturvedi Member (Technical)	MPERC
33.	Dr Umakant Panda Secretary	MPERC
34	Shri Manu Srivastav Additional Chief Secretary (Engg.)	MP State Government
35	Shri Rajani Singh MD,	MP West Discom
36	Shri S R Narasimhan, CMD	Grid Controller of India- online
37	Shri Samir Saxena, ED	Grid Controller of India- online
FOR SECRETARIAT		
38	Ms. Rashmi Somasekharan Nair Joint. Chief (RA)	CERC
OTHERS / GUESTS		
39	Shri Sanjiv Singh Consultant	ABPS
40	Shri Naveen Gupta In Charge SMCC	MPPKVVCL
41	Shri Puneet Dube, Director (Commercial)	MPWZ
42	Shri Sachin Talwar, Director (Technical)	MPWZ

Annexure-I

Resource Planning in Madhya Pradesh

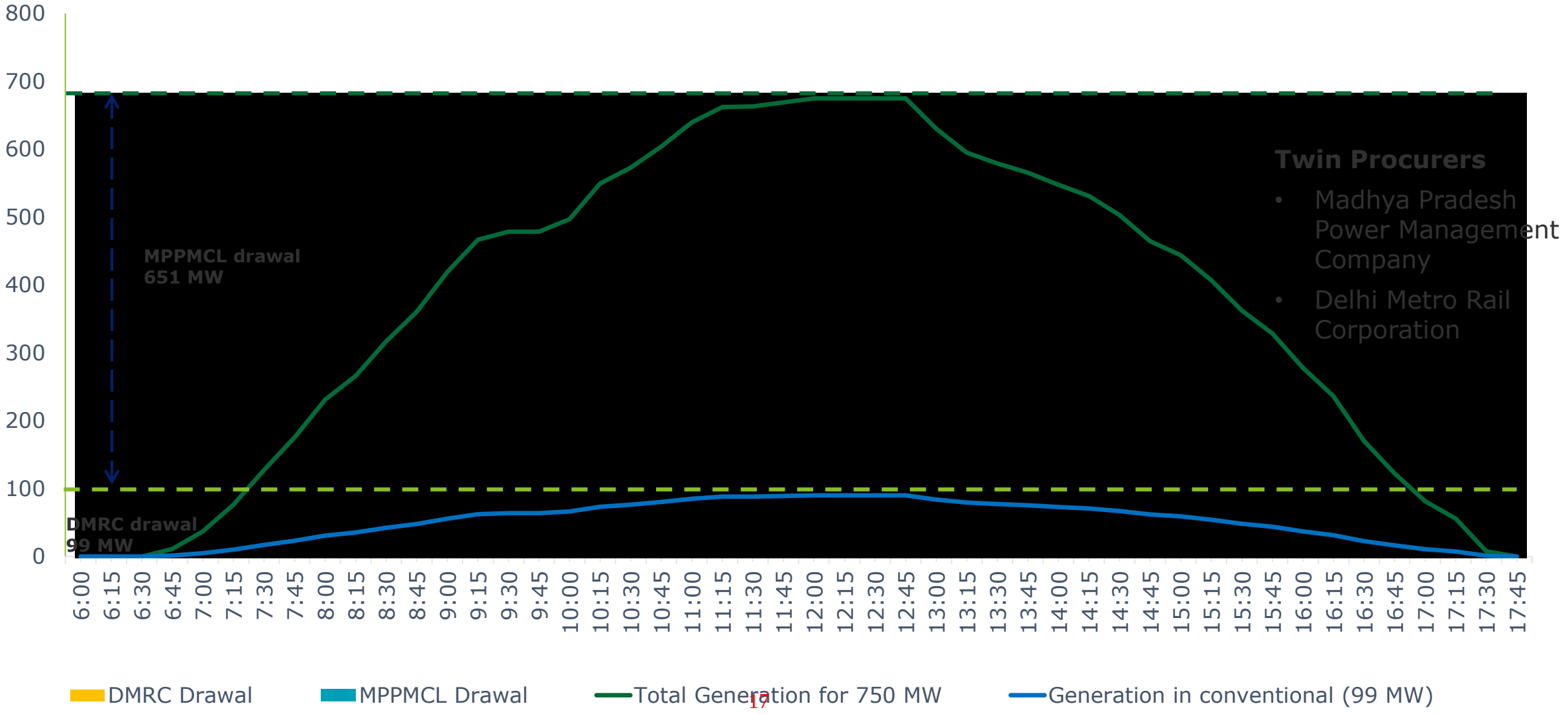
Forum Of Regulators

Shri Manu Srivastava,
Additional Chief Secretary,
Energy & NRE Department, GoMP

15

Achieving synergy by utilizing complementarity of renewable energy resources and energy demand across states

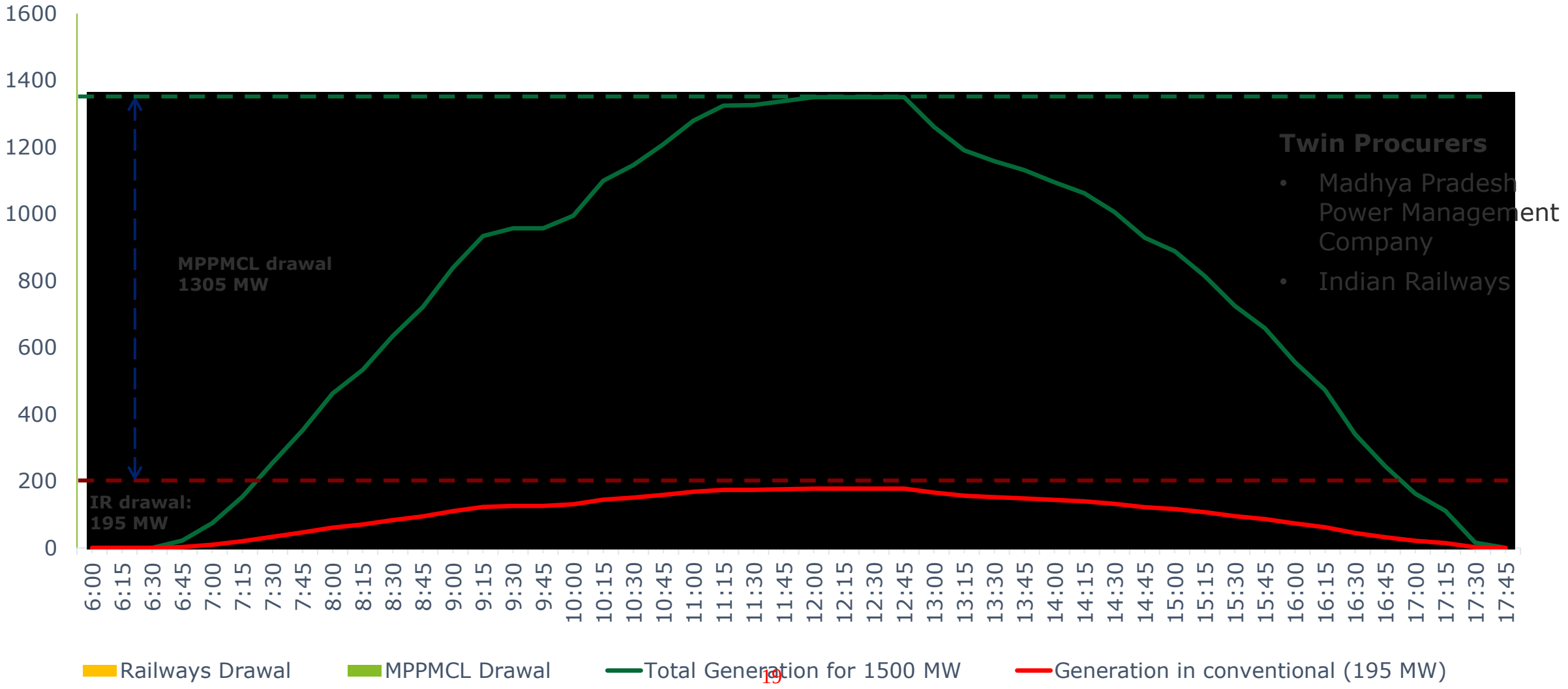
Optimum Scheduling Arrangement - 750 MW Rewa Solar Park



Solar Bidding Guidelines dated 3rd August 2017

18

Optimum Scheduling Arrangement - 1500 MW Agar-Shajapur-Neemuch Solar Parks

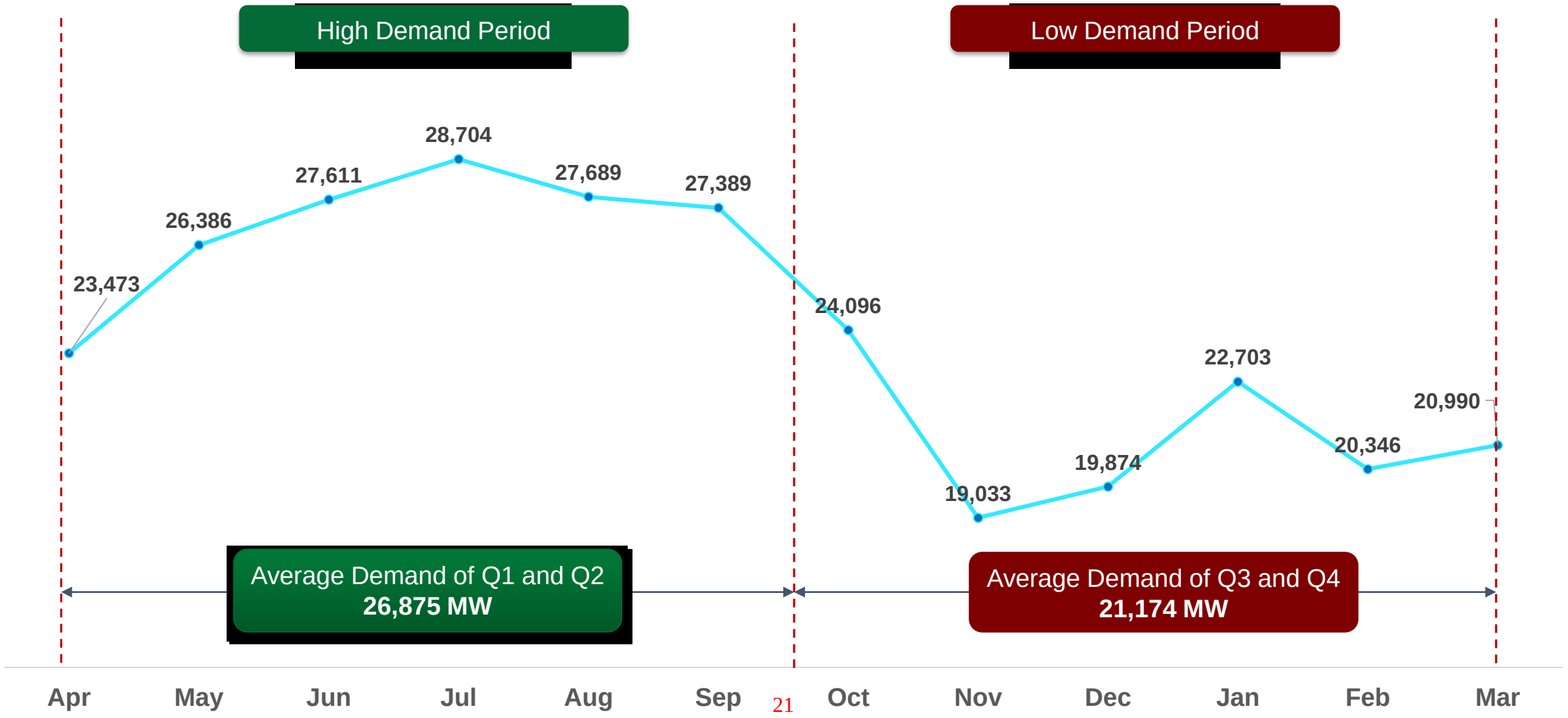


Current Regulatory framework does not incentivize twin procurer transactions

*Optimal scheduling offered higher CUF for same MW capacity or flatter supply curve to one of the procurer (i.e. DMRC/ Indian Railways), in twin procurer arrangement, without being charged for any **Premium** for availing such benefit.*

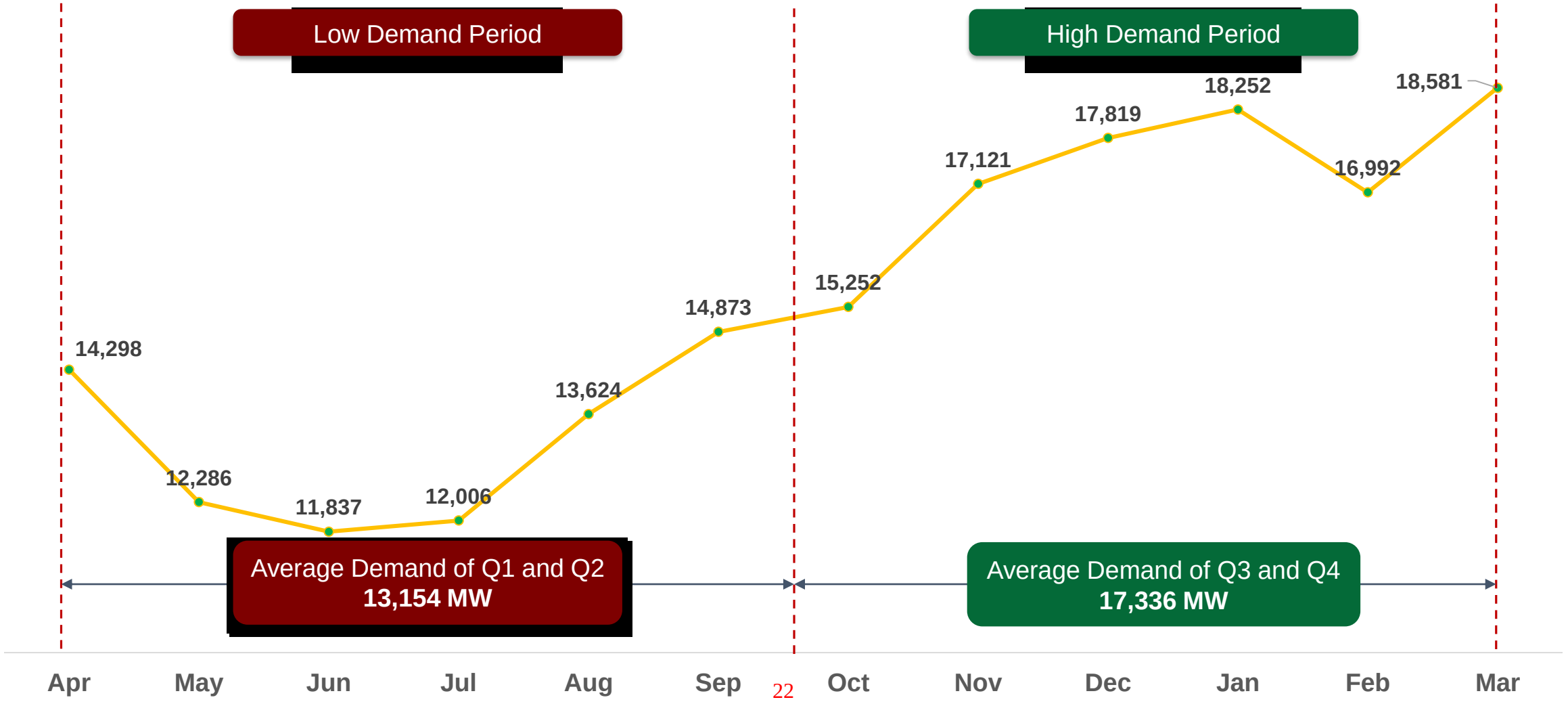
Should there be any regulatory framework to enable charging of such Premiums?

Uttar Pradesh Power Demand of FY 2023-24



Source: LGBR

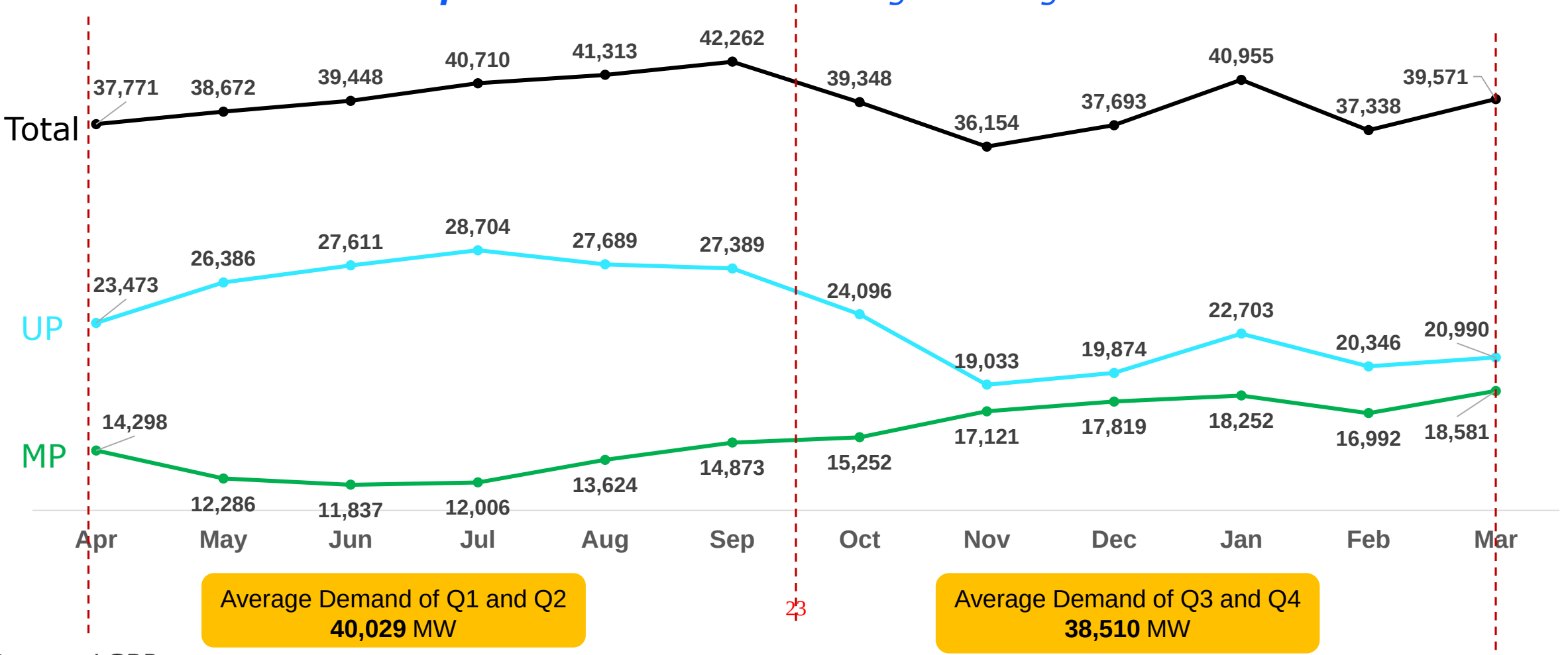
Madhya Pradesh Power Demand of FY 2023-24



Source: LGBR

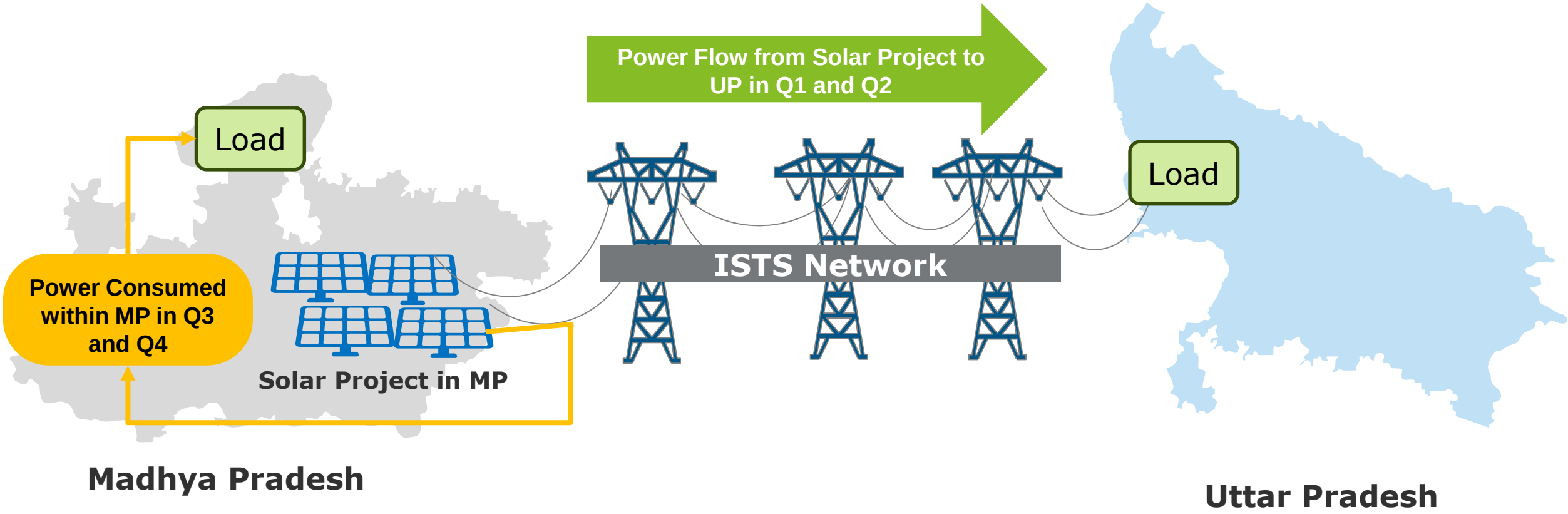
MP-UP Combined Power Demand of FY 2023-24

*Complementarity may lead to flattening of curve: **Win-Win** for both State and **optimal utilization** of state generating assets*

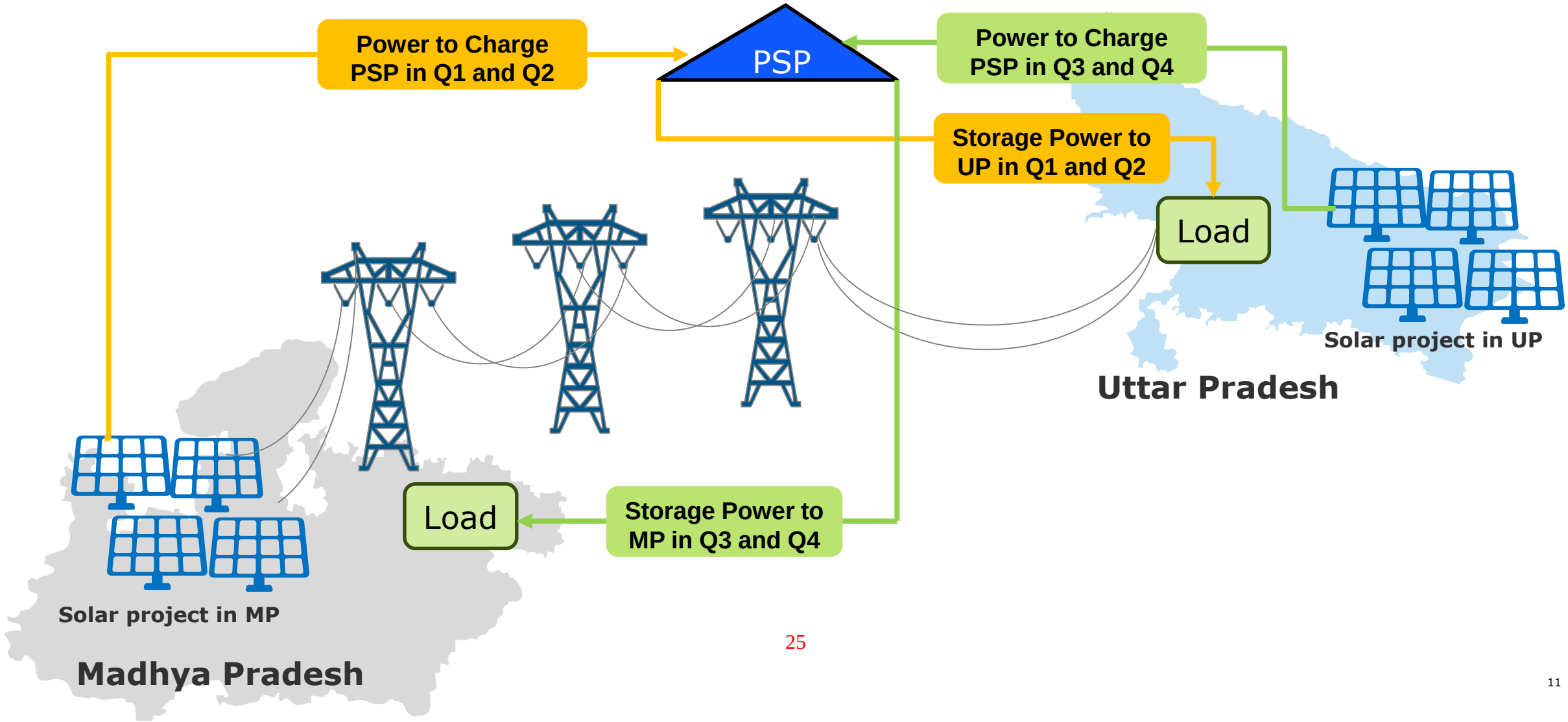


Source: LGBR

Twin procurers procuring solar power in different period (Complementarity)



Twin procurers procuring solar power in different period with Storage (Complementarity)



Firm and Dispatchable power from RE

26

Who is the best supplier of FDRE?

The Procurer

Challenges with FDRE/ RE-RTC like tenders

- Excess Generation
- Curtailment
- Co-Location Bias

- increasing complexity of tenders
- causing inefficiencies
- higher power tariffs
- not a sustainable solution

The Problem

- SLDC better placed to mix various energy sources
- Cocktails are costlier than base products
- Better to keep the risk with the Procurers
- Better for states to procure vanilla energy sources

600 MW FDRE Project in Morena MP

- Envisaged as mix of Solar + Wind +Battery + Exchange Procurement

✓ **Changed to a solar + storage project**

The Solution

27

Access to the Presentation

28

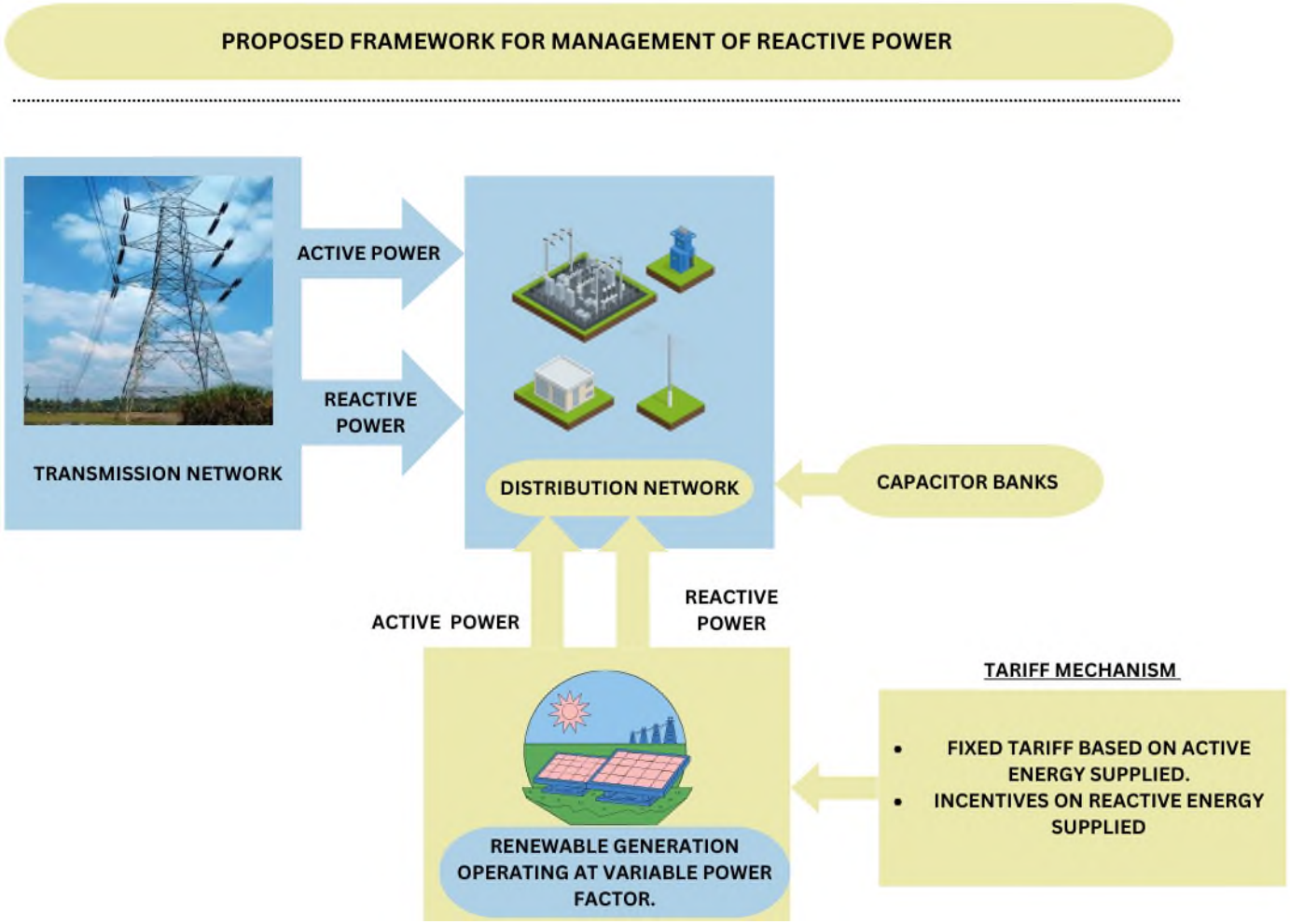
Contact Coordinates

29

Solar Generators in Distribution Network Voltage Support

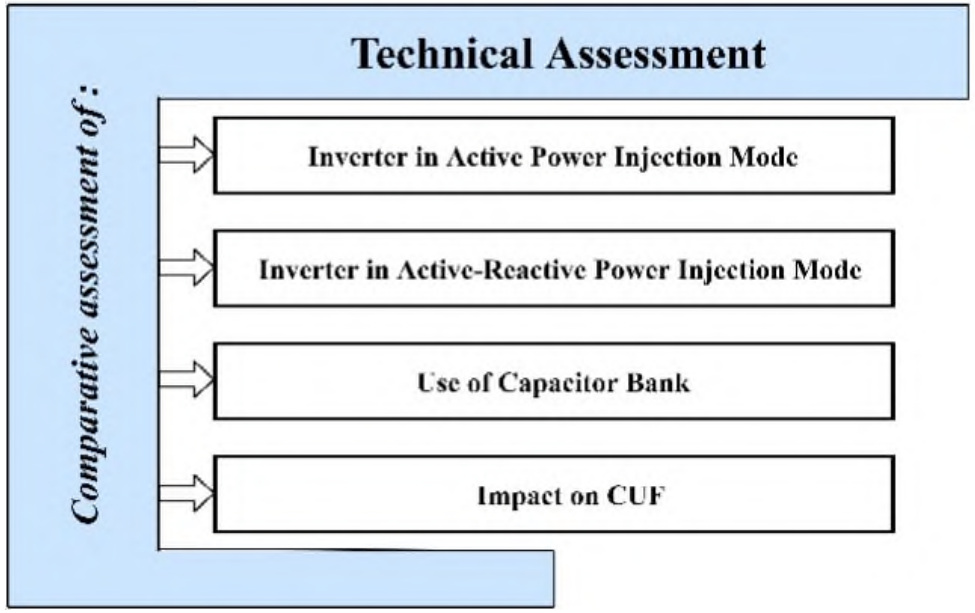
Dr. Priyanka Paliwal
Associate Professor
Department of Electrical Engineering
Maulana Azad National Institute of Technology, Bhopal

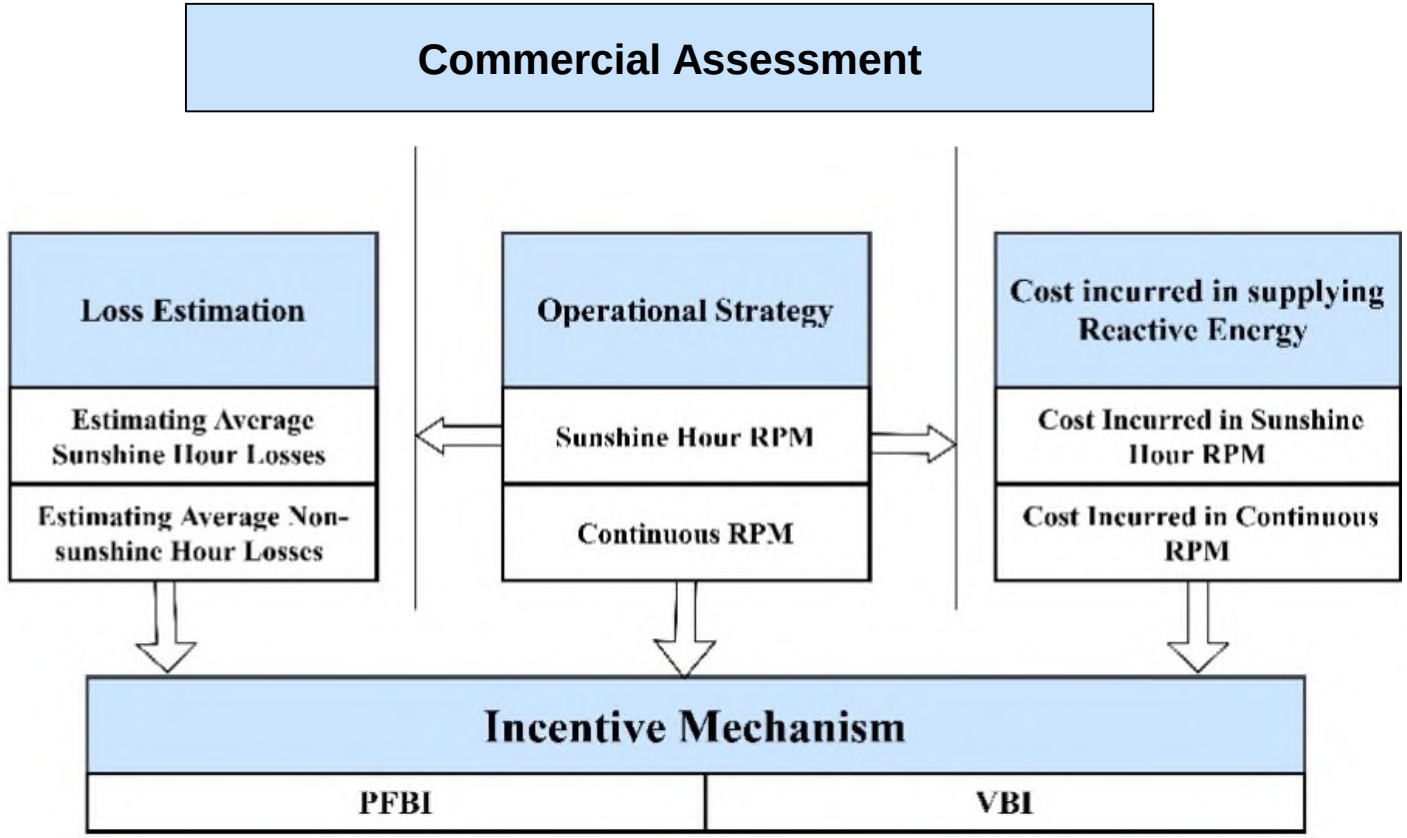
Conceptual Genesis



- *Solar inverters are inherently capable of absorbing /injecting reactive power.*
- *The dual utilization of solar inverters for both active and reactive power can reduce the burden on central reactive power compensators.*

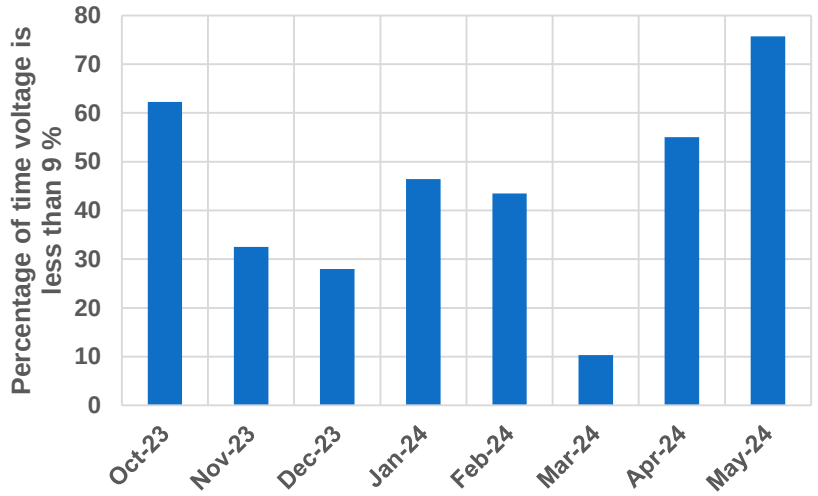
Analysis Framework

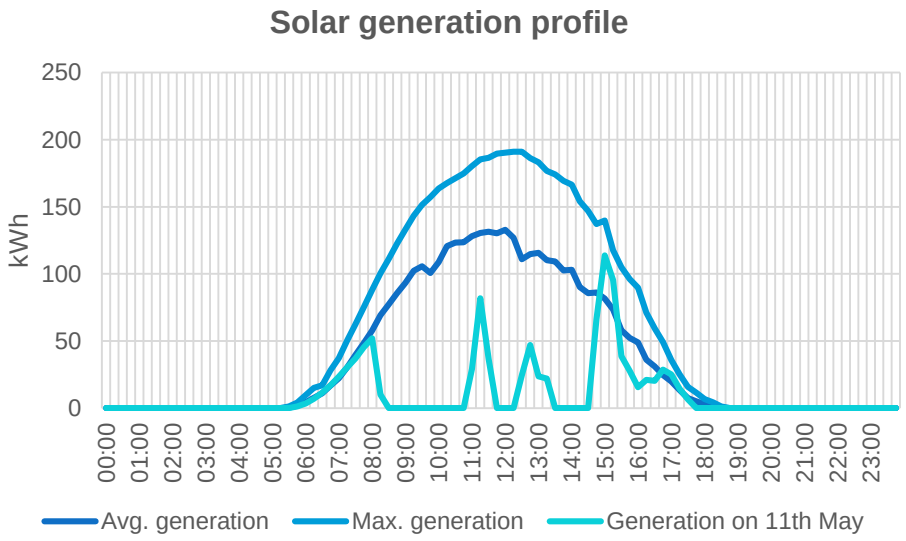


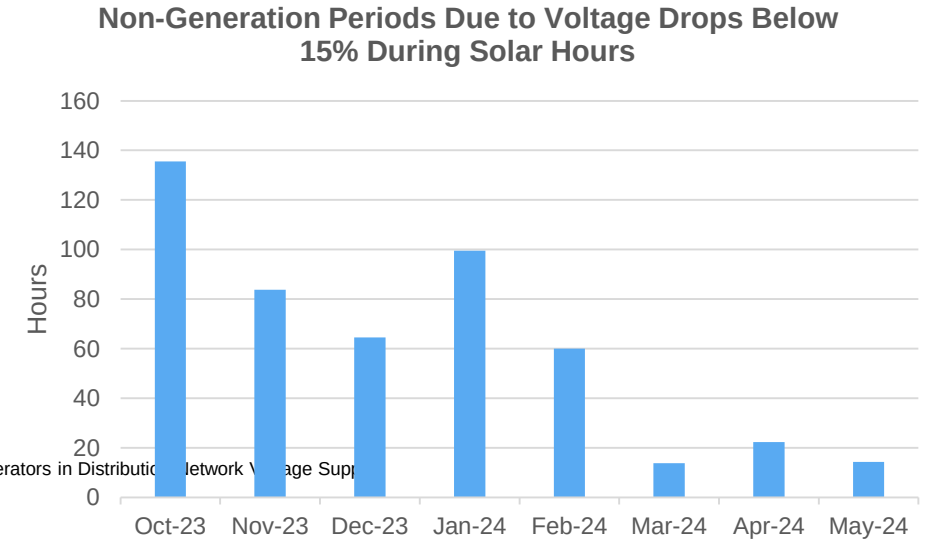


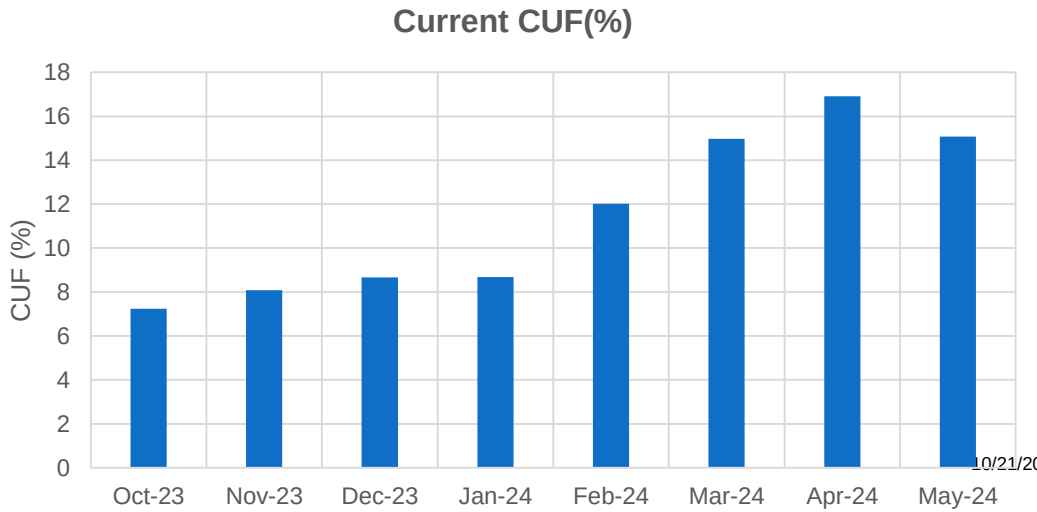
Case Study: Raipura Feeder

- Persistent low voltage issues, particularly during periods of peak electrical demand.
- KUSUM-A solar generator, injecting at unity power factor.



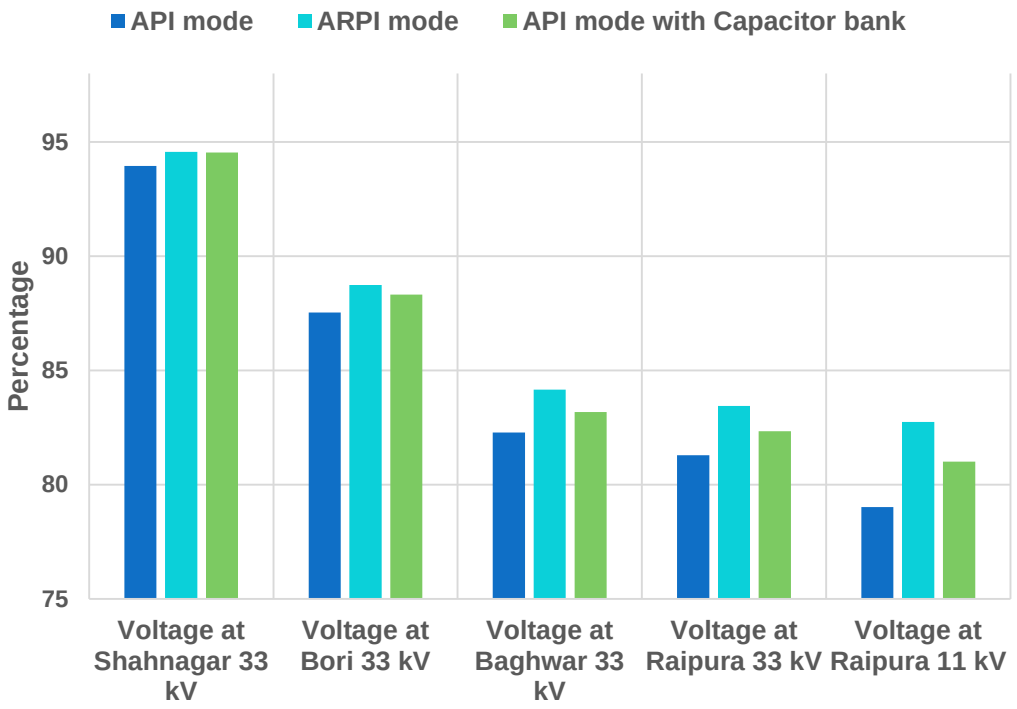


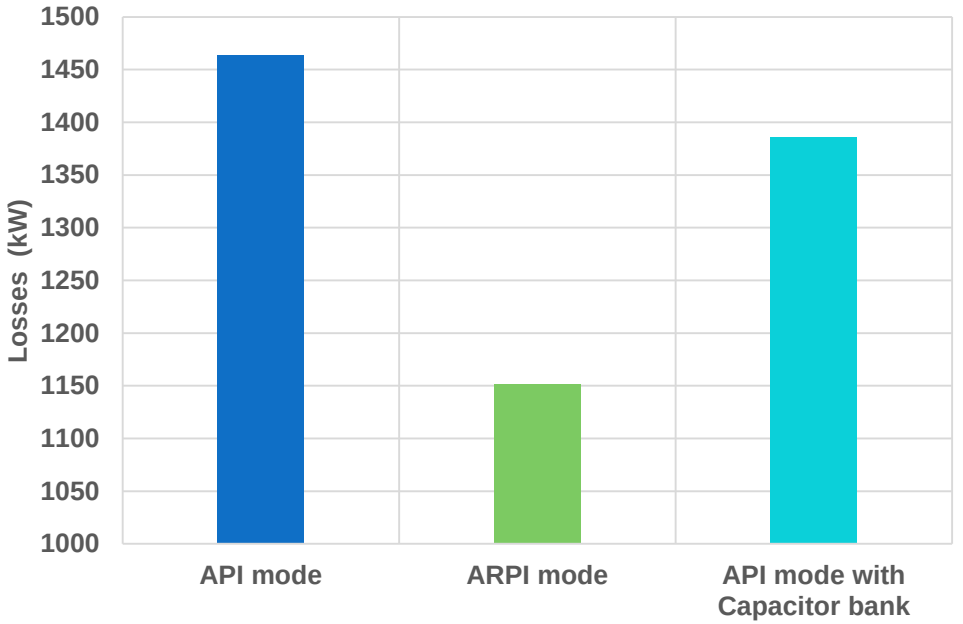




Demonstrative Analysis Case

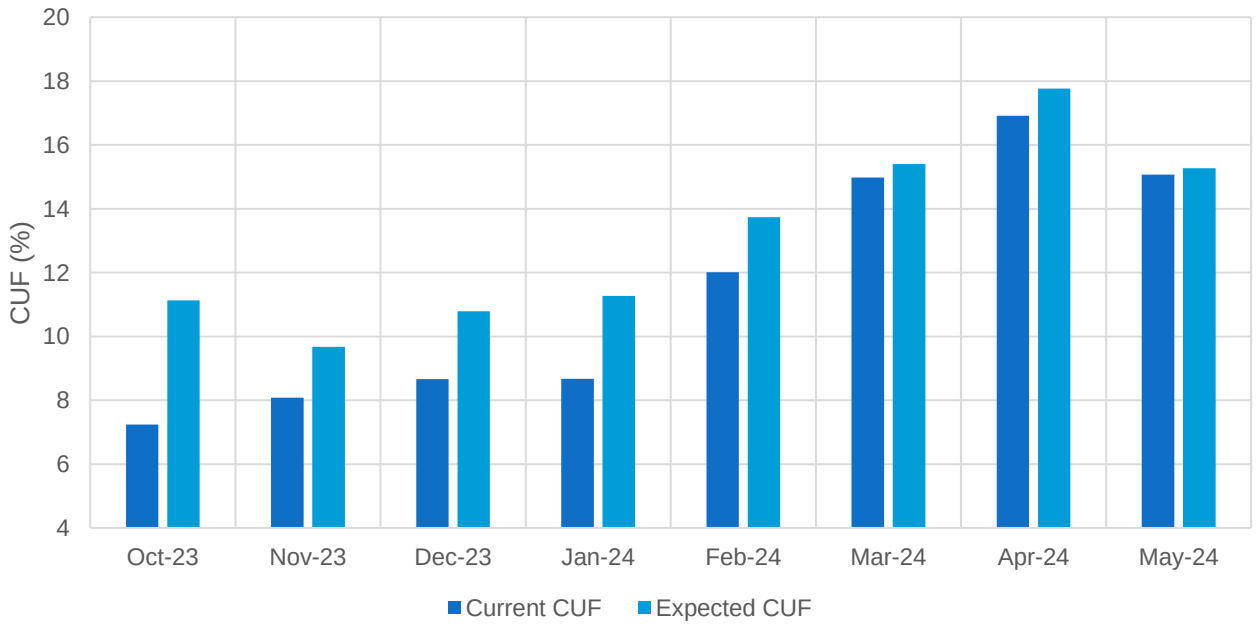
11-05-2024 at 19:30 (Maximum Loading and Minimum Voltage condition)





Comparison of Voltage Profile Enhancement and Losses Reduction

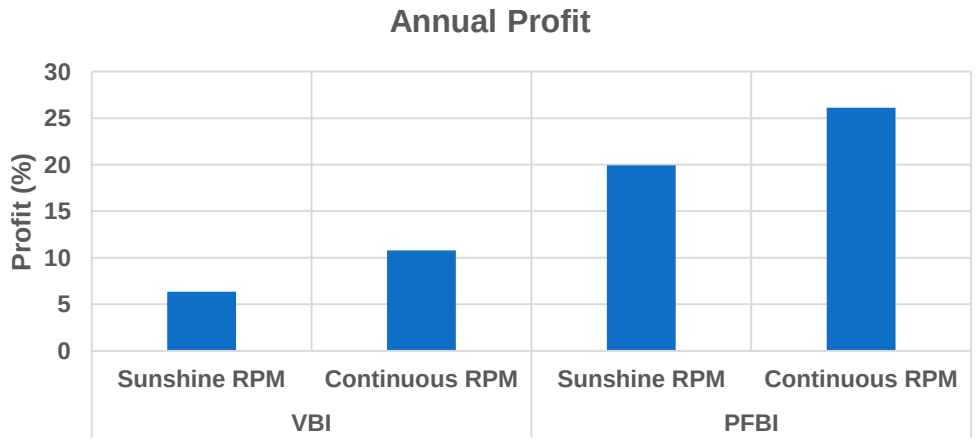
Expected Gains in Capacity Utilization Factor

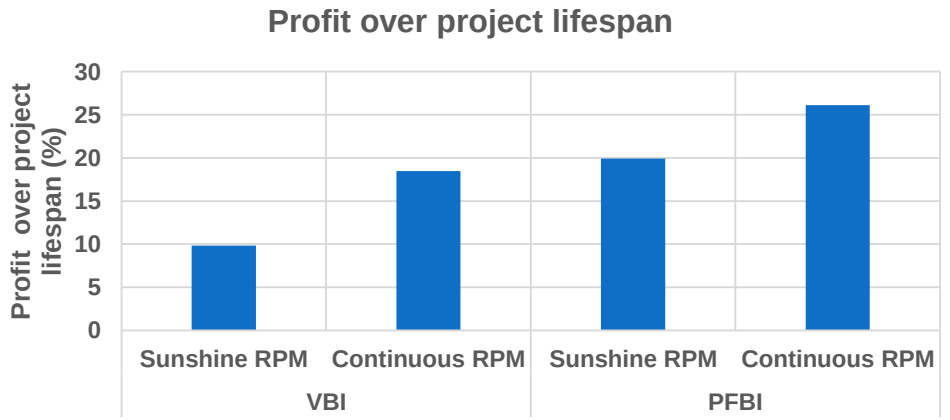


Current yearly revenue from Active Energy sales	**31 Lakhs**
Expected increase in revenue	4.5 lakhs

Implementation of Commercial Model

Incentive Mechanism	VBI		PFBI	
Operational Strategy	**Sunshine RPM**	**Continuous RPM**	**Sunshine RPM**	**Continuous RPM**
Profit (in lakhs)	1.95	3.32	6.15	8.06
% Profit	6.34	10.78	19.92	26.13
Profit over project lifespan (in lakhs)	60.6	114.04	122.94	161.27
% Profit over project lifespan	9.82	18.48	19.92	26.13





HOW DO DISCOMS BENEFIT?

- ✓ Improvement in voltage profile
- ✓ Reduction in losses
- ✓ Dynamic control
- ✓ Utilization of existing infrastructure

HOW DO SOLAR POWER PRODUCERS BENEFIT?

- ✓ Additional revenue stream
- ✓ Mitigation inverter shutdown from low-voltage conditions
- ✓ Positive impact on active power injection

HOW DOES GRID BENEFIT?

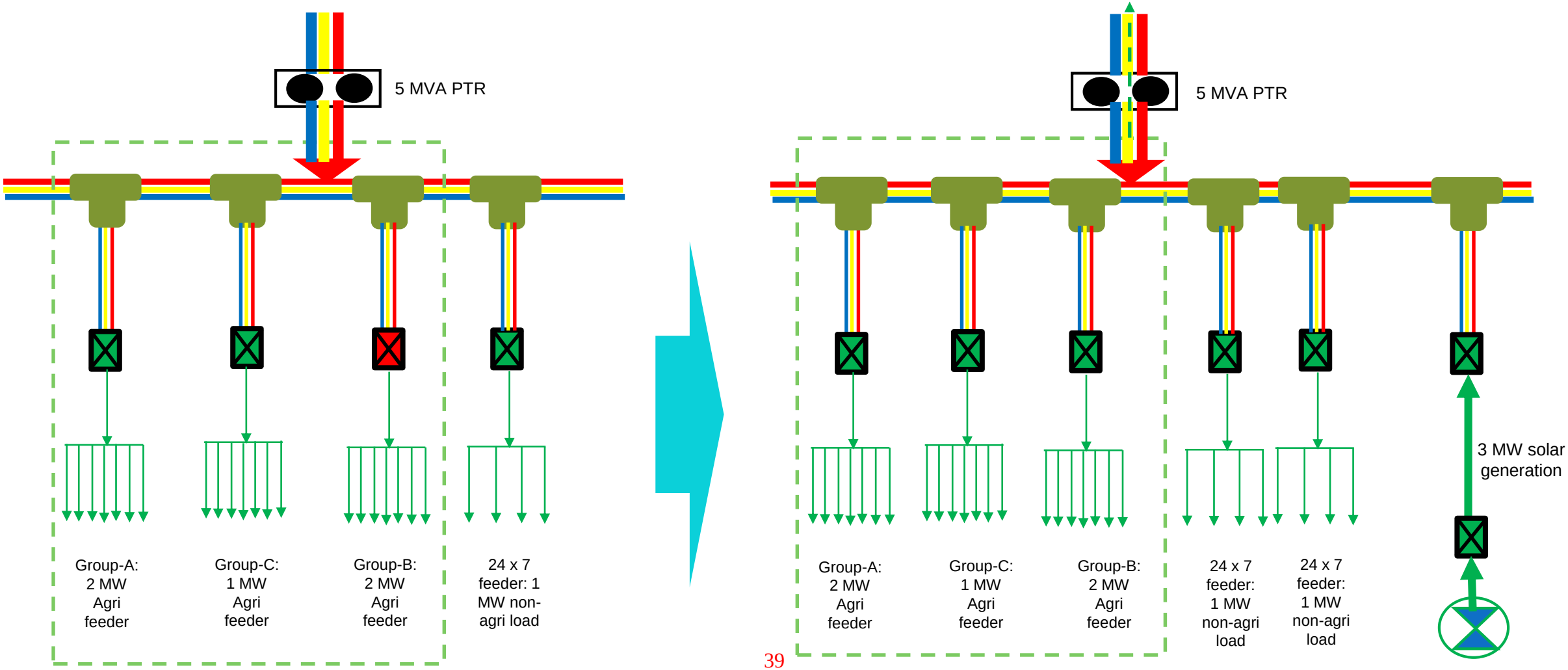
- ✓ Improved stability
- ✓ Independence in Reactive Power management for solar feeders
- ✓ Equitable distribution of operational responsibilities

Way Forward

- Implementation of pilot project

Positive techno-economic impact of KUSUM-C (FLS)

Typical representation of day-time substation operations



This work has been supported by Rewa Ultra Mega Solar Limited under World Bank Transaction Advisory Support

Dr. Priyanka Paliwal
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priyanka_manit@yahoo.com

MP Paschim Kshetra Vidyut Vitaran Co Ltd, Indore

Welcome

Hon'ble Forum of Regulators

Smart Metering in West Discom Indore

Date: 13.09.2024

MPWZ (Smart Metering)

Why DISCOM initiated the Project?

Need for Smart Metering

Need

- Poor billing and collection efficiency
- Manual meter reading & Provisional billing
- Challenges in Disconnection
- Hefty arrears
- No option of Prepaid/Net Metering facility
- Low reading availability on existing AMR system
- Absence of centralized MDM system
- Consumer complaint (billing disputes etc)
- Compliance of GoI directives.

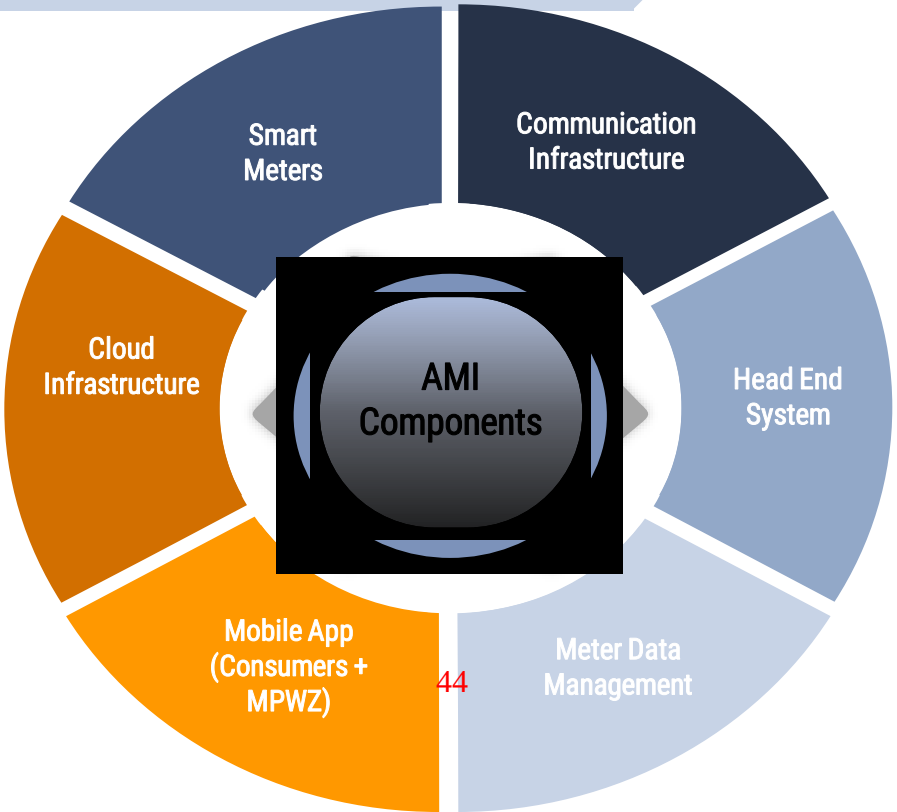
Smart Meter Functionalities

- Scheduled / on demand meter data readings at configurable intervals
- Remote Disconnection / Reconnection
- Time of day (TOD/TOU) metering
- Alarm/Event detection & notification
- Meter tampering / theft detection
- Load Control / Load Limiting
- Prepaid /Net metering facility
- Energy accounting & audit facility
- Remote firmware upgrade

Components - Advanced Metering Infrastructure

Smart Meters-

IS 16444 Marked
Tamper Proof
Modular Design
In-built Switch



Robust RF Mesh
Canopy. & Cellular

Mobile App
Ease Customer to access Bills & Data
Lesser Resolution time for resolving complaints resulting in Highly Satisfied Customer

MDM
Customizable & Configurable
Strong Analytic Engine
Exceptional Handling
Deployed on Secure Cloud Infra

Consumer Related Services provided in URJAS App

Reading Related

- Self PMR

Online LT Application

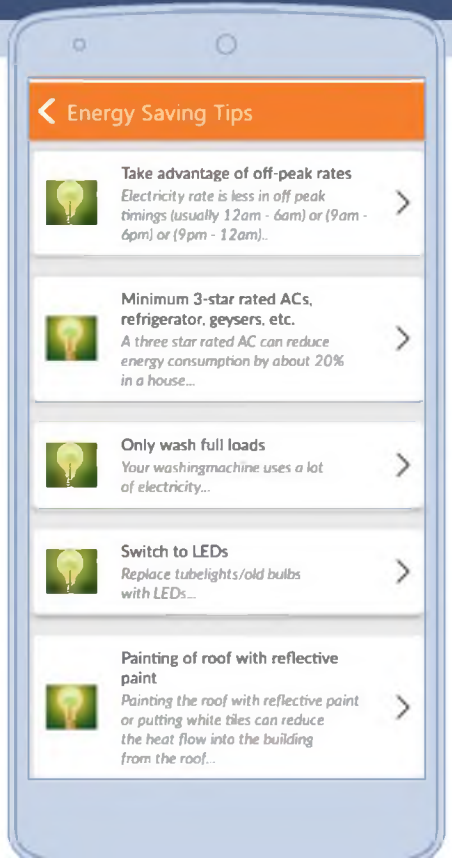
- NSC LT Application
- Load Change
- Faulty Meter Replacement
- Bill Correction
- Permanent Disconnection
- Online Payment facility
- Name Transfer
- Line Meter Shifting
- Change in Category
- Roof Top Application

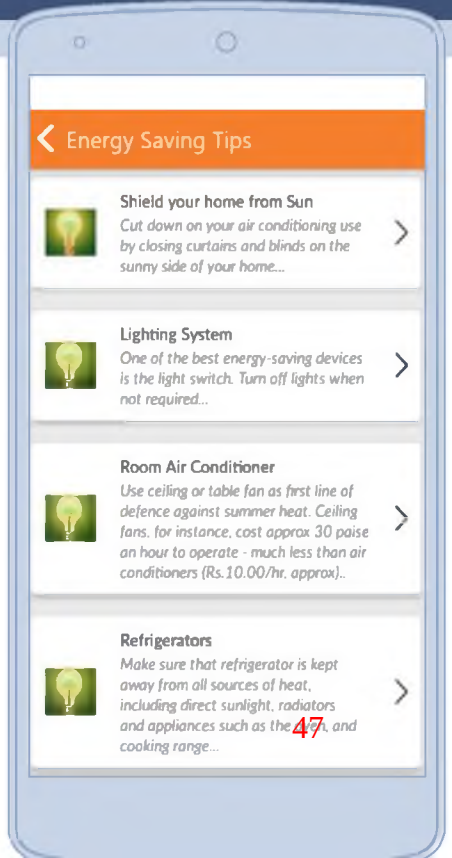
Other Applications

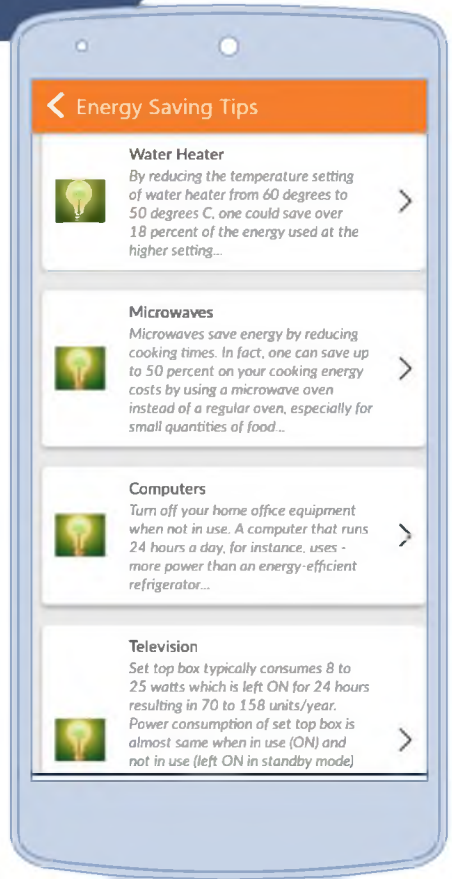
- Cable replacement
- Transformer Failure
- Online FoC
- Trace Application Status
- View Photo Meter Reading
- Smart Meter Consumption
- Energy Saving Tips
- View old to new IVRS
- View Passbook
- Add Multiple Connection/IVRS

Smart Meter Consumption Analysis for Consumers

Energy Saving Tips for Consumers in App







Project Execution & ongoing projects

Project wise Meter Installation & Progress Details

Sr. No	Project	Project Awarded	Number of Smart Meters Covered	Number of Meter Installed
1	Indore City 44 Feeders (Pilot Project)	M/s Schneider Electric Pvt. Ltd	120000	120000
2	RAPDRP 5 Town	M/s IPCL	350000	254948
3	10KW & Above Indore City	M/s BCITS Pvt. Ltd	20000	20000
4	KFW (15 Circle MPWZ)	M/s BCITS Pvt. Ltd	379079	289133
5	RDSS Phase-1	M/s Techno Electric	553013	53153
Grand Total			**1422092**	**737234**

Data Provided by Smart Metering System

Smart Billing System basically provides 5 types of data as mentioned below-

a. **Instantaneous Data** - Readings of (i) Voltage, (ii) Current, (iii) PF, (iv) Cumulative KwH, (v) Demand, (vi) Frequency, every 15 minutes.

b. **Load Survey Data** - Readings of (i) Voltage, (ii) Current, (iii) Energy consumption during time block of 15 minutes, every 15 minutes.

c. **Daily Profile** – Cumulative KwH at 00.00 Hrs daily.

d. **Billing Data**– (i)ToD Wise Cumulative KwH, (ii) Billing KwH, (iii) MD (with date and time of occurance), (iv) Average Monthly Power, (v) Total Minutes of Use (time when power was drawn).

e. **Event Data** – Indicators of transactions / aberrations (events, which are programmed into meters).

Data Analytics & Tamper Detection

51

Analysis performed by utilising the Smart Metering data

MDM system generates various actionable MIS, utilising above data.

a. **Consumption Based Analysis:**

b. **Event Based Analysis:**

c. **Data Based Analysis:**

Data Analytics

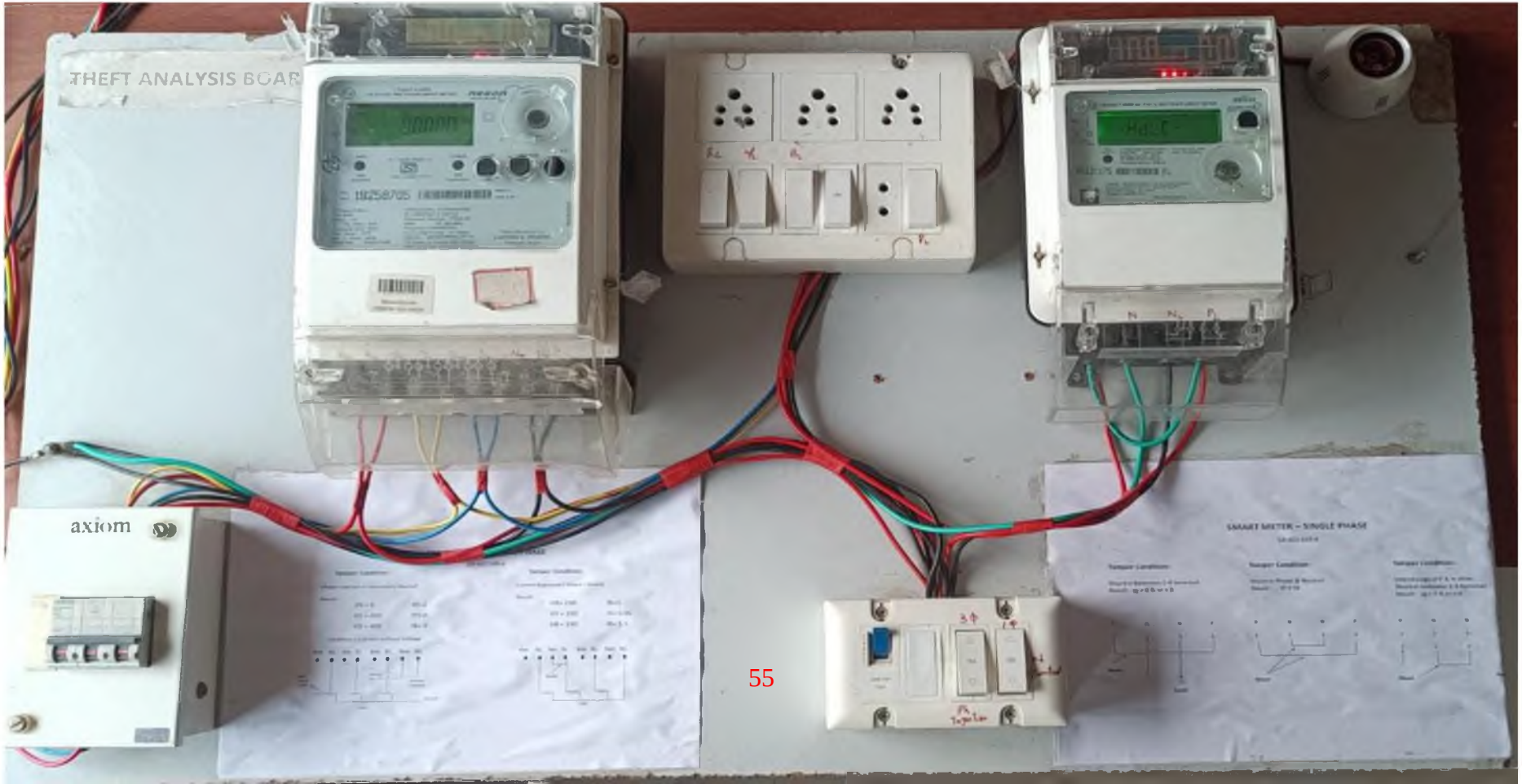
A Full Fledged Data Analytics Engine has been developed in MDM Solution.

1. More than 63 type of reports have been developed and deployed to monitor consumer behaviour,
2. An elaborate marking system has also been developed to identify severity of aberrations observed.
3. All aberrations are classified in three categories, namely (1) Highly Suspected Theft, (2) Critical (3) Non Critical.
4. All Aberrations are shown on ATR Tab of MDM Solution.
5. Highly Suspected Theft cases go to CVO through ATR portal for action.
6. In other cases, the cases 10 KW & above are sent to EE (NLTMT) or EE (STM).
7. Balance cases are sent to zone/ DC.
8. All concerned officers have to make entry of action taken in each case on ATR portal.
9. Regular follow-up and monitoring is done to ensure action on cases listed on ATR portal.

Possible Revenue leakages

Sr. No.	Particulars	Classification	Data Analysis and possible outcomes
1	Meter related	Meter Tampering	Ip ≠ In, In = 0 & Ip > 0, Ip = 0 & In > 0, R/Y/B-Phase CT Open, R/Y/B Phase Voltage Missing, Low PF, Low Voltage in any phase, Over Voltage in any phase, Neutral Disturbance, Single wire operation (neutral missing), Earth Loading, Night Zero Consumption, Techno commercial marking system
		Remote Circuit in Meter	
		Meter Bypass	
		Direct Theft	
		Current Without Voltage	Continuous Current without voltage throughout the month & current > 0.1 Amp and Phase injected in load side neutral through MCB
2	Tariff related	Tariff Misuse	Purpose change cases
3	Unauthorised Supply	Disconnected on Arrears	Consumer taking supply from neighbor meter or from incoming side of Meter, tampering of service line e.t.c.
4	Demand & PF Violation	MD>SL , PF<0.8	MD >SL for last two consecutive months
5	Meter Defective	Meter terminal power leakages	Defective meters, terminal burnt (due to loose contact)
6	Consumption Drop	Zero Consumption and Less Load Factor	Meter fully bypass or less use and No use

Theft Detection Board



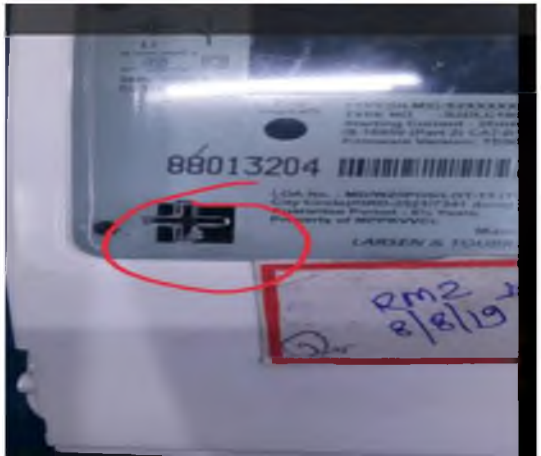
Some Cases of Theft By Consumer in Smart Meter

1) Shunt Found in Meter Terminal

2) Bypass System

3) Using Magnet

Tamper Cases-

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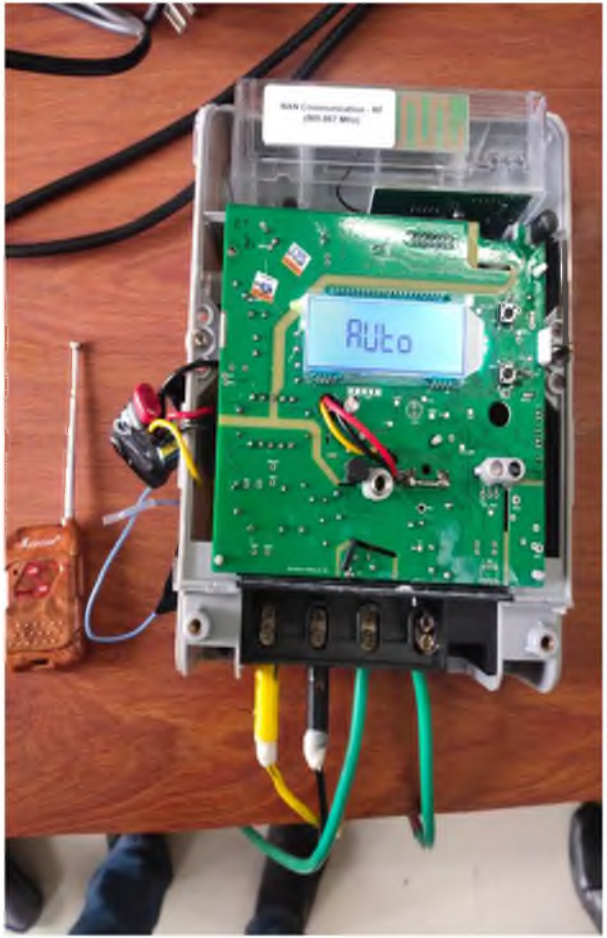
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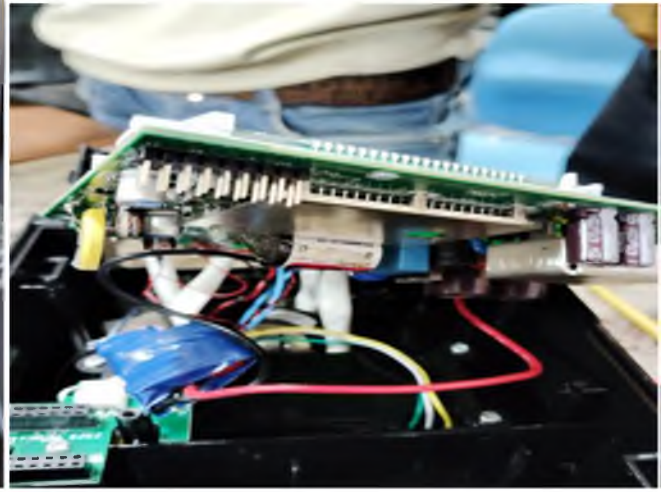


Project Benefits (Interim Results)

60

Smart Meter project Benefits : Discom Perspective

- Average Monthly Units Billed improved by 13.63% and Average Monthly Per Consumer current bill improved by 21.46% which is around Rs 250 Rs Per Bill
- Total 18196 cases identified against aberrations reported, leading to additional billing of Rs 21.96 Crore.
- 96.28 MW increase in (45761 Connection) sanctioned load on the basis of recorded MD which is around 15 % of total load of Smart Metering Consumer, monthly fixed charges of around Rs 81.78 Lacs started
- More than Rs 839.39 Lakh. recovered against MD> SL Penalty Earlier, accurate recording of MD was not happening in case of less than 10 KW load consumers. 61

- PF Penalty (PF<0.80) imposed on around 243 K bills of SSI Amounting Rs. 746.30 Lacs
- 6.57 Lacs successful remote disconnections / reconnections of around Rs 308.63 Cr on arrear.
- 1523 No. Consumers are converted from Domestic to NDL/IP, monthly fixed charges of approx Rs 15.23 Lacs started .
- Accurate & timely availability of billing data (>98 %), provided billing data of 177.74 Lakh bills through AMI & provided reading even in Lockdown and Curfew of Covid-19 Pandemic
- Consumer Load Profile monitoring.

Smart Meter project Benefits Consumer Perspective

Consumer Perspective

- Reduction in Bill Related Complaints :- Accurate and timely billing, that too without any human intervention has resulted in substantial reduction in Bill Related complaints resulting in increased Consumer Satisfaction
- Development of Mobile App for consumers:- MPPKVVCL, Indore has also deployed Mobile App wherein Smart Metering Consumer can check the consumption during the day ,week , month or year and monitor the same.
- Power factor incentive to consumers who are maintaining pf more than 0.85. Discom has provide to incentive to 489K bills amounting Rs 25.68 Cr.
- Net- Metering feature is incorporated in the smart meters to cater the need of prosumers who opt for Solar Roof Tops. Total 3707 Smart Meter converted into Net meter with connected load 25.9 MW

स्मार्ट मीटर से उपभोक्ताओं को होने वाला लाभ :-

- मीटर रीडिंग एवं बिलिंग में पारदर्शिता।
- किसी भी मानवीय हस्तक्षेप के बिना सही समय पर वास्तविक विद्युत खपत बिल की उपलब्धता।
- बिल एवं मीटर रीडिंग संबंधीत शिकायतें न होना।
- मोबाईल ऐप (ऊर्जस मोबाईल ऐप) एवं www.mpwz.co.in वैब पोर्टल के माध्यम से प्रतिदिन, साप्ताहिक एवं मासिक रीडिंग उपभोक्ताओं द्वारा स्वयं देख पाना। ऊर्जस ऐप को गुगल प्ले स्टोर से फ्री में डाउनलोड किया जा सकता है।
- स्मार्ट मीटर से प्राप्त विद्युत खपत के आधार पर सब्सिडी हेतु पात्र सभी उपभोक्ताओं को आसानी से सब्सिडी का लाभ होगा।
- औद्योगिक एवं व्यवसायिक उपभोक्ताओं को 0.85 से अधिक PF रखने पर Incentive देना।
- नेट-मीटरिंग सुविधा को स्मार्ट मीटर में शामिल किया गया है ताकि Solar Roof Tops का विकल्प चुनने वाले उपभोक्ताओं की आवश्यकता को पूरा किया जा सके।
- बिल्ट-इन-प्री-पेड सुविधा :- एक ही मीटर का उपयोग पोस्ट-पेड और प्री-पेड Mode दोनो के साथ किया जा सकता है भविष्य में उपभोक्ता को प्री-पेमेंट Mode की सेवा दी जा सकेगी जिसमें प्री-पेड उपभोक्ताओं को टैरिफ ऑर्डर के अनुसार मूल ऊर्जा शुल्क पर 25 पैसे प्रति यूनिट की छूट रहेगी।

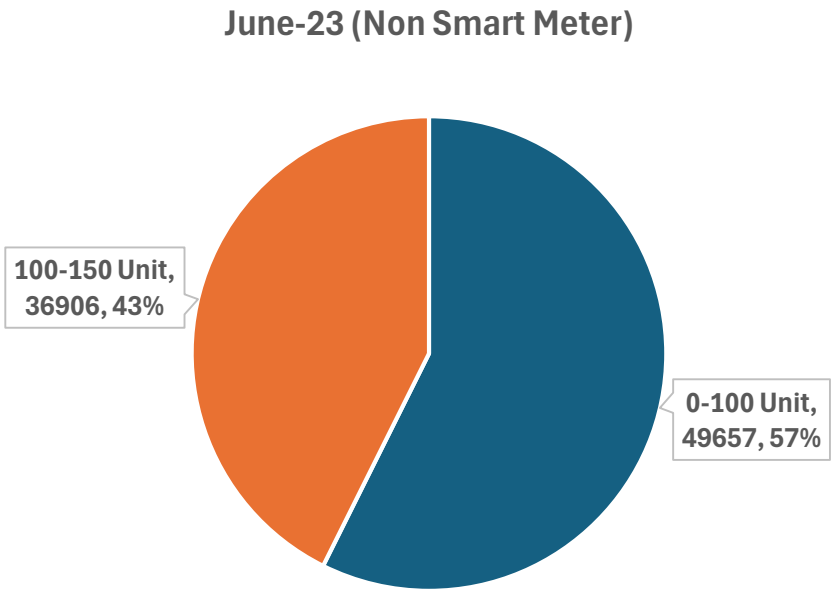

स्मार्ट मीटर- उपभोक्ता संतुष्टि की दिशा में अभूतपूर्व कदम
समय पर मानव हस्तक्षेप के बिना रीडिंग
रीडिंग तय समय, तय दिन पर बिलिंग में दर्ज
उपभोक्ता के मोबाइल पर रीडिंग संबंधी डाटा लाइव
उपभोक्ता संतुष्टि के लिए कस्बों में चेक मीटर स्थापित
मतलब साफ- स्मार्ट तरीका अपनाकर वास्तविकता से परिपूर्ण रीडिंग और त्रुटिरहित बिल सेवा
बड़वानी, सेंधवा, पानसेमल, खेतिया आदि में स्मार्ट मीटर के पास चेक मीटर लगाए गए, दोनों पृथक मीटरों की रीडिंग में समानता से मिली उपभोक्ताओं को अपार संतुष्टि.....
Urjas
1912
ONE NATION ONE NUMBER
FOR ELECTRICITY COMPLAINTS
मध्यप्रदेश पश्चिम क्षेत्र विद्युत वितरण कंपनी लिमिटेड इंदौर

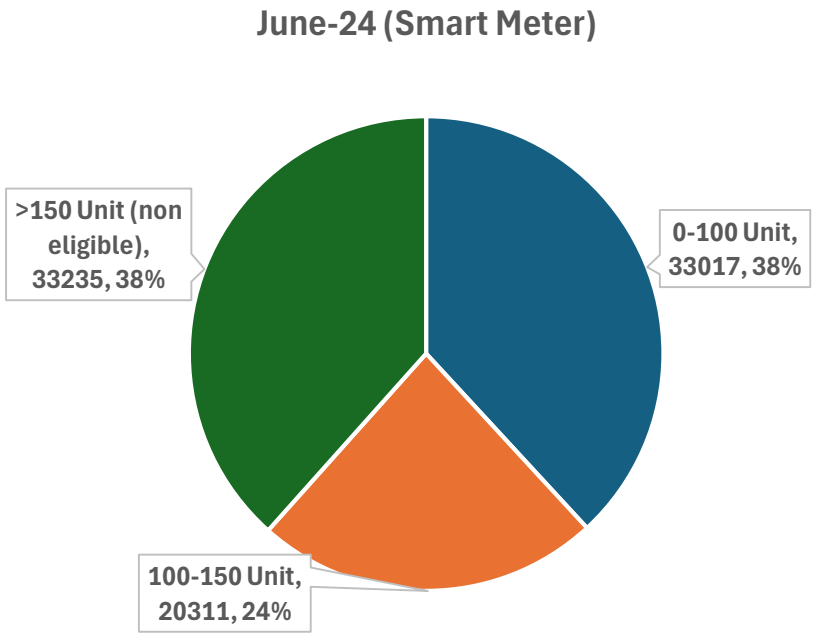
Smart Meter project Benefits Government Perspective

Government Perspective

- Improvement in Financial Health of DISCOM
- Increased consumer satisfaction
- Due to availability of Meter Data - Subsidy can be addressed to the genuine consumers.

Impact of Smart Meter on Subsidy





Thank You

Showcase of Accuracy of Smart Meter with respect to Old Electronic Meter in series.

Smart Meter Buzz/ Alerts in Newspaper

ऊर्जस एप पर दिखेगी स्मार्ट मीटर की कुंडली

ग्राहक यह जान सकेगा इस माह औसत कितना बिल आएगा, आज सबसे ज्यादा खपत कितने बजे हुई

विशेष संवाददाता

भोपाल, 8 मई। स्मार्ट सिटी इंदौर में बिजली कंपनी उपभोक्ताओं को तकनीकी स्तर पर नई ऐप से एप और सुविधा दी जा रही हैं। शहर में लगे हजारों स्मार्ट मीटर कनेक्शन वाले उपभोक्ता। अपने मीटर की सारी जानकारी ऊर्जस एप पर पा सकेंगे। इसमें माह का मौजूदा खपत के आधार पर औसत बिल, आज किस वक्त सबसे ज्यादा बिजली जलाई, लोड कितना है, अभी बिजली चालू है या नहीं... आदि जानकारी सीधे मोबाइल मिलेगी।

पश्चिम क्षेत्र बिजली वितरण कंपनी ने अपने ऊर्जस एप को बहु उद्देशीय बनाया है। अभी ऊर्जस से बिल सुधार, लाइट बंद होने, ऑन लाइन पेमेंट, सेल्फ फोटो मीटर रीडिंग, बिजली लोड में बदलाव, नया कनेक्शन लेने, बिल डाउन लोड करने समेत कुल 14 सुविधाएं मिलती थी। अब इस एप में और बड़ा बदलाव कर नई सुविधा जोड़ी जा रही है, यह सुविधा सबसे अद्भुत होगी। इंदौर शहर में लग रहे 75 हजार रेडियो फ्रिक्वेंसी स्मार्ट मीटर वाले उपभोक्ताओं के लिए एप में विशेष सेटअप तैयार किया जा रहा है। इससे जुड़ने वाले उपभोक्ता अपने स्मार्ट मीटर की जानकारी मोबाइल एप पर जान सकेंगे। अभी तक मीटर के पुराने फोटो एवं बिल के अलावा अन्य जानकारी एप पर नहीं मिलती थी, अब नई सुविधा जोड़ी जा रही है। नई प्लान में ऊर्जस एप पर स्मार्ट मीटर की हलचल यानि उसकी जानकारी उपभोक्ता घर से दूर होकर भी जान सकेगा। इसमें पुरानी खपत, चालू माह की कुल खपत, माह में दैनिक औसत खपत, माह में अभी तक का कुल बिल, पूरे माह का मौजूदा खपत के आधार पर औसत बिल, बिजली बचाने के उपाय, दिन विशेष में किस वक्त सबसे ज्यादा बिजली का उपयोग हुआ, बिजली के बिल की पे बाय डेट क्या है, वर्तमान खपत के आधार पर लोड

फैक्टर क्या है, आदि जानकारी स्मार्ट सिटी इंदौर के ग्राहक अपने स्मार्ट फोन से रेडियो फ्रिक्वेंसी स्मार्ट मीटर के बारे में जान सकेंगे। ऑन लाइन बिल पेमेंट की लिंक, 6 माह का रिकॉर्ड, बिजली बचाने के उपाय, [illegible], कंपनी के नए इंदौर या कार्यवाही का भी उल्लेख होगा। घर से दूर मोबाइल एप यह भी बताएगा कि घर में बिजली है या नहीं है। इस तरह की नई सुविधा नि:शुल्क मिलने से उपभोक्ताओं को मोबाइल पर अंगुली चलाने से ही भागमभाग से मुक्ति मिल जाएगी।

दिल्ली को बताई खासियतें

रेडियो फ्रिक्वेंसी स्मार्ट मीटर की खासियत इसी माह दिल्ली को टीम इंदौर के बिजली अधिकारी पुनीत दुबे, सुब्रता राय, नवीन गुप्ता आदि ने दी है। इसके बाद दिल्ली में रेडियो फ्रिक्वेंसी स्मार्ट मीटर के सफल प्रोजेक्ट के चलते चीफ इंजीनियर पुनीत दुबे को स्मार्ट ग्रिड फोरम के आयोजन में सम्मानित भी किया गया है।

450 रोटरों का इस्तेमाल

रेडियो फ्रिक्वेंसी स्मार्ट मीटर की रीडिंग दर्ज करने के लिए औसतन 250 ग्राहकों पर एक विशेष उपकरण रोटर लगाया गया है। यह दस से पंद्रह गली, एक छोटी कालोनी के सभी घरों के स्मार्ट मीटरों की रीडिंग मात्र पांच सेकंड में कर सकता है। इस तरह 65000 मीटरों को रीड करने के लिए 450 से ज्यादा रोटर लगाए जा चुके हैं।

इनका कहना है....

एप में कस्टमर लाइव रहेगा, ताकि उसे बिजली की सारी जानकारी लाइव मिलेगी। खपत कम करने के तरीके मिलेंगे, बिल कैल्क्युलेटर भी होगा। इससे स्मार्ट सिटी के ग्राहकों को और सौगात मिल जाएगी। विवाद नहीं होंगे।

- विकास नरवाल, एमडी मप्रपक्षेविविकं, इंदौर

Now, check your power use in real time on discom app

Feature Will Be Functional In A Week

Times News Network

Indore: Upgrading its mobile application service, Madhya Pradesh Paschim Kshetra Vidyut Vitaran Company Ltd now plans to introduce a new feature for consumers to access real time power consumption.

Discom officials said that this new feature would soon be available on "Urjas" mobile application through which consumers would be able to track power consumption on hourly, daily and monthly basis. Besides, it will help consumers check their daily highest consumption, and even billing amount as per their usage. The new feature will be available for consumers with smart meters installed at their houses.

"This new feature is meant to empower consumers by showing their online consumption. We have already started working on this and we hope to make it available for consumers within a week or so," said discom's chief managing director Vikas Narwal.

He said that they are not only working on technology deployment, but also on capabilities for smooth integration of information and operation technologies.

"We are in process to develop a robust infrastructure for smooth transition from conventional meters to smart metering with integration of information. The project has already started with installation of communication and back-end IT upgrades," he added.

Detailing about this new future, discom officials said there will be a separate window in Urjas mobile application where consumers would be able to track their consumption on real time basis," they said, adding that consumers would also get tips on power saving techniques to reduce their consumption.

"Also, there will be direct link in case if the consumer wants to pay the bill online," they added.

The Urjas application comes with around 14 features including complaints, application for new connection or change in load etc.

SMART MOVE

- Consumers who have smart meters at home can access the feature on Urjas in a week
- They will be able to track power consumption on hourly, daily and monthly basis
- They can check daily highest consumption and even billing amount as per their usage

- They will also get tips on power saving techniques to reduce consumption

प्रभातकिरण
इंदौर, बुधवार
27 मार्च 2019
3

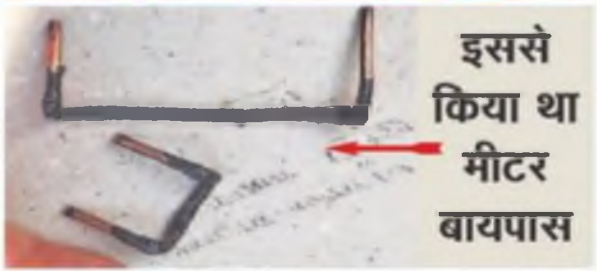
स्मार्ट-मीटर में छेड़छाड़... अलार्म बजा!

कंट्रोल रूम से सूचना मिलते ही पहुंची टीम, बिजली चोरी का केस बनाया

इंदौर. नगर प्रतिनिधि। स्मार्ट मीटर लगाने के बाद उसमें छेड़छाड़ आसान नहीं रही। जैसे ही एक घर में बिजली चोरी के लिए मीटर बायपास किया गया, कंट्रोल रूम में अलार्म बज गया और टीम ने मौके पर पहुंचकर पंचनामा बना दिया।

शहर में जितने भी स्मार्ट मीटर लगाए गए हैं, उन पर कंट्रोल रूम से निगरानी होती है। पोलोग्राउंड मुख्यालय के कंट्रोल रूम पर हर जानकारी लगातार दर्ज होती रहती है। यहां अलार्म बजने पर पता लगा कि 117, मराठी मोहल्ला (सदर बाजार) में स्मार्ट मीटर से छेड़छाड़ की गई है। कंट्रोल रूम के कर्मचारियों ने इसकी खबर जीपीएच झोन के इंजीनियर अंकुर गुप्ता को दी। उन्होंने तुरंत टीम के साथ छापा मारा, तो राजेश गौड़ के मकान में लगे मीटर में रंगेहाथ बिजली चोरी पकड़ी गई।

गुप्ता ने बताया कि कॉपर संट से स्मार्ट मीटर को बायपास कर बिजली जलाई जा रही थी, जबकि बकाया पैसा न देने पर इसका कनेक्शन काटा जा चुका था। जाहिर है कि किसी जानकार ने ही ऐसा करने की कोशिश की थी, लेकिन उसे पता नहीं था कि इस मीटर



में छेड़छाड़ होते ही कंट्रोल रूम पर सूचना पहुंच जाती है। बहरहाल, यहां बिजली चोरी का मामला दर्ज कर लिया गया है। गुप्ता ने बताया कि तीन मंजिला मकान में एक किलोवॉट का कनेक्शन लिया गया था, जबकि तीन किलोवॉट का इस्तेमाल किया जा रहा था।

उनके मुताबिक ये इलाका बिजली चोरी के लिए काफी बदनाम रहा है। यहां बीते साल बिजली चोरी के पांच सौ केस उन्होंने बनाए थे। बाद में स्मार्ट मीटर लगाए गए, जिससे बिल में बीस फीसद का इजाफा हुआ। पुरानी आदत के मुताबिक कुछ लोग फिर से बिजली चोरी की कोशिश कर रहे हैं, लेकिन स्मार्ट मीटर में ऐसा किया जाना संभव नहीं है।

कुछ समय पहले हमने बकाया वसूली के लिए अभियान चलाते हुए 2800 कनेक्शन काटे थे। इसमें से 1800 लोगों ने पैसा भी जमा कर दिया। हजार लोग अभी तक नहीं आए। इसलिए शंका तो थी कि कहीं ये बिजली तो नहीं चुरा रहे। इन पर नजर रखने के लिए टीम बनाई है, वहीं कंट्रोल रूम को भी अलर्ट कर दिया था। जैसे ही मराठी मोहल्ले में स्मार्ट मीटर को बायपास कर बिजली चोरी की कोशिश की गई, अलार्म बज गया और टीम ने मौके पर पहुंचकर कार्रवाई कर दी।

❐ **सुब्रतो राय** (शहर अधीक्षण यंत्री)

स्मार्ट मीटर योजना के मास्टर कंट्रोल सेंटर का शुभारंभ

इंदौर। मध्यप्रदेश पश्चिम क्षेत्र विद्युत वितरण कंपनी की महत्वपूर्ण एवं उपभोक्ता हितैषी स्मार्ट मीटर योजना के नए मास्टर कंट्रोल सेंटर का गुरूवार की शाम शुभारंभ किया गया। मुख्य अतिथि के रूप में उपस्थित प्रबंध निदेशक श्री अमित तोमर ने कहा कि यह सेंटर इंदौर के अलावा उज्जैन, रतलाम, देवास, महू, खरगोन, झाबुआ, सेंधवा के उपभोक्ताओं के लिए भी उपयोगी साबित होगा। इस सेंटर पर स्मार्ट मीटर परियोजना से जुड़ी अनुभवी इंजीनियर टीम दायित्व संभालेगी। सेंटर पर सीसीटीवी, 80 वर्ग फीट की वीडियो वाल, लेपटॉप, कम्प्यूटर, टेबलेट, अग्निरोधी उपकरण, डेटा एनालेटिक टीम आदि का समावेश किया गया है। इस अवसर पर मुख्य महाप्रबंधक श्री रिंकेश कुमार वैश्य, निदेशक श्री पुनीत दुबे, श्री सचिन तालेवार, अधीक्षण यंत्री श्री आरबी दोहरे, श्रीमती सुषमा गंगराड़े, स्मार्ट मीटर योजना की नई अधीक्षण यंत्री श्रीमती कीर्ति सिंह, कंट्रोल सेंटर प्रभारी श्री नवीन गुप्ता आदि मौजूद थे।

Bhopal 11/7/24

Smart meters enhance consumer satisfaction

FP News Service

BARWANI

Embracing the Digital India initiative, the MP Paschim Kshetra Vidyut Vitaran Company Limited has commenced the installation of smart meters across Barwani district.

More than 35,000 meters have already been deployed in urban hubs such as Barwani, Sendhwa, Pansemal and Khetia. Superintendent engineer Dadhichi Rewadia highlighted the significant benefits these meters bring to consumer satisfaction. The smart meters enable consumers to monitor their meter readings directly on mobile devices, ensuring accuracy with no room for human error or timestamp discrepancies. This advancement has effectively eliminated billing errors, enhancing transparency and reliability. Shyam Barde, MLA of Pansemal, was briefed by the company's team.

मप्र विद्युत नियामक आयोग अध्यक्ष ने इंदौर में ली मिटिंग, देखी स्मार्ट मीटरिंग

गुणवत्तापूर्ण आपूर्ति, उपभोक्ता हित के कार्य के प्रति संवेदनशीलता जरूरी

स्मार्ट मीटर योजना एवं सूचना प्रौद्योगिकी कार्य पर जताई प्रसन्नता

गुड इवनिंग, इंदौर

बिजली कंपनी के प्रत्येक कार्य स्तर पर परफार्मेंस सुधार जरूरी है, गुणवत्तापूर्ण आपूर्ति, उपभोक्ता हित के कार्यों के प्रति संवेदनशीलता होना चाहिए। उपभोक्ता एवं कंपनी दोनों के हितों के साथ ही आगे बढ़ना होगा।

मप्र विद्युत नियामक आयोग भोपाल के अध्यक्ष एसपीएस परिहार ने यह बात कही। वे शुक्रवार को पोलोग्राउंड इंदौर स्थित मप्रपक्षेविविकं के सभागार में विद्युत वितरण कंपनी के अधिकारियों को संबोधित कर रहे थे। परिहार ने कहा कि उपभोक्ता व कंपनी के हित में आए सुझावों पर अमल किया जाएगा। दूसरे राज्यों के आयोगों की रिपोर्ट के आधार पर और सुधार लाया जाएगा। इस दौरान मप्रपक्षेविविकं के प्रबंध निदेशक अमित तोमर ने उन्हें कंपनी के कार्यों, उपभोक्ता सेवा, आपूर्ति, राजस्व संग्रहण आदि की जानकारी दी। आयोग अध्यक्ष परिहार ने स्मार्ट मीटर की कार्यप्रणाली एवं तीन साल में आए बदलावों की रिपोर्ट विस्तार से देखी। पश्चिम क्षेत्र विद्युत वितरण कंपनी के सूचना प्रौद्योगिकी विभाग द्वारा तैयार कॉल सेंटर सॉफ्टवेयर, एनजीबी, डोर टू डोर कलेक्शन सिस्टम की जानकारी ली। अध्यक्ष ने पश्चिम क्षेत्र विद्युत वितरण कंपनी के सूचना प्रौद्योगिकी विभाग के कार्य एवं स्मार्ट मीटर कंट्रोल सेंटर की गतिविधियों से प्रसन्नता जताई। परिहार ने मीटरों का संग्रहालय भी देखा, जहां चालीस से पचास साल पुराने मीटर मौजूद है। उन्होंने अधिकारियों से सुझाव भी मांगे एवं स्वयं डायरी में दर्ज किए। इस दौरान मुख्य महाप्रबंधक संतोष टैगोर, निदेशक मनोज झंवर, कार्यपालक निदेशक संजय मोहासे, गजरा मेहता, मुख्य अभियंता एसआर बमनके, एसएल करवाड़िया, स्मार्ट मीटर योजना के अधीक्षण यंत्री डीएस चौहान, स्मार्ट मीटर कंट्रोल सेंटर प्रभारी नवीन गुप्ता आदि ने जानकारी प्रस्तुत की।

City's smart meter system is model for many states

Representatives from 15 states, three countries see its functioning so far

OUR STAFF REPORTER
Indore

The radio frequency smart meter system of Indore, which has successfully reduced line losses, increased convenience of consumers and enhanced revenue of MP Western Region Power Distribution Company, has invited attention of many states and three countries.

So far, electricity distribution companies of 15 states in the country and three countries have witnessed functioning of smart meters of Indore. Five states have been started implementing the smart model of Indore.

The states which showed their interest in Indore's smart meter system include Tamil Nadu, Delhi, Himachal, Uttar Pradesh, North Bihar, Chhattisgarh, Manipur, Gujarat, Jharkhand, Uttarakhand, Odisha and Punjab.

FACTORY SEIZED FOR DEFAULTING ON POWER BILL

West Discom on Thursday seized a factory for defaulting on power bill. One Hemraj Gurjar was running a factory from a rented building. Bill amounting to Rs 3.34 lakh was pending on him. On Thursday, a team of officials reached the factory and sealed it. On learning about, the landlord reached the scene and informed officials that Gurjar had taken his building on rent and had now fled. In the evening, the landlord paid the pending dues after which the building possession was handed over back to him.

> "It is a matter of pride for us that energy companies from many states in Indian and abroad showed interest in our smart meter system. At present, smart meters are being installed in Ujjain, Mhow and Ratlam."
>
> **Amit Tomar**, MD, West Discom

Apart from this, teams from Ghana, Bangla country, Germany have also closely studied the good works related to smart meters of Indore.

Indore was first in the country to have installed more than one lakh smart meters two year ago. Indore's first phase of the smart meter project with radio frequency readings has been widely appreciated in the country as well as abroad. So far 15 states including Tamil Nadu, Delhi, Himachal, Uttar Pradesh, North Bihar, Chhattisgarh, Manipur, Gujarat, Jharkhand, Uttarakhand, Odisha, Punjab have studied the smart meters of Indore. Five have also started working smart meters in one way or the other. Apart from this, teams from Ghana, Bangladesh and Germany have also studied the smart meter system model of Indore.

West Discom officials told the visiting team members that the system was successful in checking the power theft but also helped the company in generating bill on actual reading.

इंदौर का स्मार्ट बिजली मीटर भी नजीर ; 15 राज्य और तीन देशों ने सीखी यहां की तकनीक

मेरी खिलखिलाती

इसी के सहारे मप्र पश्चिम क्षेत्र बिजली कंपनी स्मार्ट सिटी बनाने, उपभोक्ता सुविधा बढ़ाने और राजस्व जुटाने में देश में सबसे सफल

कंट्रोल सिस्टम पर चला पता जाता है कि किस मीटर की बिजली खंद

कंट्रोल सेंटर में देख सकते हैं 1.20 लाख मीटर की कुंडली

देश-दुनिया के आने से कंपनी के इंजीनियर का आत्मविश्वास बढ़ा

आईआईटी बिजली कंपनी के लिए आर्टिफिशियल इंटेलिजेंस और मशीन लर्निंग टूल्स में मदद करेगा

दल ने किया बिजली कंपनी का दौरा, स्मार्ट मीटर कंट्रोल सेंटर देखा

इन्दौर : गुरुवार, अप्रैल 21, 2022, 19:48 IST

भारतीय प्रौद्योगिकी संस्थान (आईआईटी) इंदौर बिजली कंपनी के लिए नई तकनीक उपलब्ध कराएगा, इससे कंपनी और उपभोक्ता दोनों को फायदा मिलेगा। यह बात आईआईटी के दो सदस्यी दल ने बिजली कंपनी के दौरे में कही।

आईआईटी इंदौर से डॉ. तृप्ति जैन के नेतत्व में दो सदस्यी दल बिजली वितरण कंपनी को पोलोग्राउंड मुख्यालय पहुंचा। दल ने स्मार्ट मीटर के लिए विशेष रूप से बनाया हाईटेक कंट्रोल सेंटर देखा। इस दौरान शहर में वर्ष 2018 से लेकर अब तक स्मार्ट मीटर की योजना के कार्य, तकनीकी उन्नयन, उपभो सुविधा, देशभर में स्मार्ट मीटरिंग को लेकर की जा नालेज शेयरिंग, सही रीडिंग, सही बिलिंग के बाद विवादों में अत्यंत कमी और अन्य कार्य, उपलब्धियों के बारे में दल को जानकारी दी गई। इस दौरान डॉ. तप्ति जैन ने कहा कि आईआईटी के इलेक्ट्रिकल

जिला जनसम्पर्क कार्यालय
इन्दौर

बिजली कंपनी के लिए नई तकनीक उपलब्ध कराएगा, इससे कंपनी और उपभोक्ता दोनों को फायदा मिलेगा। यह बात आईआईटी के दो सदस्यी दल ने बिजली कंपनी के दौरे में कही।

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प्रबंध निदेशक ने बताया स्वागतयोग्य

मध्यप्रदेश पश्चिम क्षेत्र बिजली वितरण कंपनी के प्रबंध निदेशक श्री अमित तोमर ने आईआईटी के दल के दौरे को स्वागत योग्य बताया कहा कि आईआईटी इंदौर सतत ही बिजली कंपनी मदद करती है। हमारे बोर्ड में भी आईआईटी का सदस्य होता है, आईआईटी की पहल निश्चित ही ऊर्जा क्षेत्र के लिए मिल का पत्थर साबित होगी।

FREE PRESS

indore,13/4/22

SKOCH Silver Award to West Discom for Smart Meter

OUR STAFF REPORTER
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Madhya Pradesh West Zone Electricity Distribution Company has been awarded SKOCH Silver Award for development of Smart Metering along with AMI system.

The first of its kind and the most advanced radio frequency smart meter project in the country, has received the country's prestigious Scotch Silver Award.

The announcement of the award was made on Tuesday evening.

Various power companies of the country, energy departments of different states, banks, institutions providing government services, and technical institutions were vying for SKOCH awards.

West Discom has bagged the Silver Award for best services, best presentation of planning works before SKOCH team, meeting voting and other parameters.

West Discom managing director Amit Tomar dedicated the award to Smart Meter Scheme chief engineer SR Bamanke, superintending engineer DS Chauhan, Centralized Smart Meter Control Center in-charge Naveen Gupta and their entire team.

Tomar said that Mhow is the first urban town of MP where 100 smart meters have been installed. In Indore, Ujjain, Ratlam, Dewas and Khargone so far three lakh smart meters have been installed.

नेशनल ट्रेनिंग में समझी इंदौर की स्मार्ट मीटर योजना

देश के 72 बिजली बोर्ड, कंपनियों, ट्रेनरों ने की सहभागिता

इंदौर. नेशनल पावर ट्रेनिंग इंस्टिट्यूट फरीदाबाद के तत्वावधान में देशभर के 72 बिजली बोर्ड, बिजली वितरण कंपनियों, ट्रेनरों के लिए दो दिनी ऑन लाइन विशेष ट्रेनिंग कार्यक्रम आयोजित किया गया. इसमें मप्र में इंदौर की स्मार्ट मीटर योजना की सफलता देशभर के बिजली अधिकारियों को बताई गई.

मप्र पश्चिम क्षेत्र विद्युत वितरण कंपनी के मुख्य अभियंता एसआर बमनके ने विभिन्न राज्यों के प्रतिनिधियों को बताया कि किस तरह का सर्वप्रथम रेडियो फ्रिक्वेंसी स्मार्ट मीटर का बड़े स्तर पर कार्य इंदौर में प्रारंभ किया गया है. किस तरह चीजों का चयन किया गया, [illegible] उपभोक्ता सुविधाएं बढ़ाई गईं, तकनीक जानकारी दी गई. श्री बमनके ने यह भी बताया कि स्मार्ट मीटरीकरण में आई चुनौतियों का कुशलतापूर्वक किस तरह मुकाबला किया गया, फेजवार या किस तरह कार्य किया गया. आज इंदौर का स्मार्ट मीटर कार्य अधिकतर देशभर में चर्चा में आ गया है. मुख्य अभियंता यह भी बताया कि इंदौर शहर के बाद अब इसी तरह कंपनी के पांच अन्य शहरों में स्मार्ट मीटर प्रोजेक्ट चल रहे हैं, जिसकी [illegible] अच्छी है. इंदौर से ही अधीक्षण यंत्री स्मार्ट मीटर डीएस चौहान, केंद्रीय कक्ष प्रभारी नवीन गुप्ता आदि ने भी ऑन लाइन भाग लेकर विभिन्न राज्यों के प्रतिनिधियों को स्मार्ट मीटर संबंधी जानकारी दी, उनके प्रश्नों का तर्कपूर्ण जवाब देकर जिज्ञासाओं का समाधान किया.

इंदौर की सीख उपयोगी

मप्रपक्षेविविकं के प्रबंध निदेशक अमित तोमर ने बताया कि नेशनल पावर ट्रेनिंग इंस्टिट्यूट एवं केंद्रीय ऊर्जा मंत्रालय ने मप्र योजना के लिए [illegible] घोषित किया है. [illegible] देशभर में [illegible] की राज्यों को जानकारी दे रहे हैं। राज्यों के ये प्रतिनिधि अपने यहां इंदौर के इन अनुभवों की जानकारी देंगे और स्मार्ट मीटर व अन्य नई तकनीकी योजनाओं को लागू करेंगे.

दैनिक भास्कर

खंडवा भास्कर 07-08-2024

भास्कर खास • पहले चरण में लग चुके हैं 9201 स्मार्ट मीटर, इन्हीं में छेड़छाड़ और चोरी पकड़ी

बिजली की चोरी पकड़ रहे स्मार्ट मीटर, एक महीने में 20 को पकड़ा, 10.87 लाख का जुर्माना लगाया, 1.46 लाख वसूले

भास्कर संवाददाता | खंडवा

इलेक्ट्रॉनिक मीटरों के बाद अब शहर के उपभोक्ताओं के घर स्मार्ट मीटर लगाए जा रहे हैं। आधुनिक तकनीक से लैस यह मीटर लगते ही बिजली की चोरी करने वाले उपभोक्ताओं को पकड़ रहे हैं। बिजली कंपनी ने एक महीने में ऐसे 10 उपभोक्ताओं को पकड़कर उन पर 10.87 लाख रु. का जुर्माना लगाया, और इससे 1.46 लाख रु. वसूली भी की। कंपनी को 10 और उपभोक्ताओं द्वारा मीटर में छेड़खानी कर चोरी करने की जानकारी मिली है, अफसर वहां पहुंचकर पंचनामा बनाएंगे और जुर्माना वसूलेंगे। प्रदेशभर में ग्राहकसेवाकेंद्र द्वारा अपने उपभोक्ताओं के घर पर स्मार्ट मीटर लगाने का काम किया जा रहा है। इसी के तहत खंडवा जिले में इसकी शुरुआत शहर के चार फीडर जिसमें रमा कालोनी फीडर, रामेश्वर फीडर, टूटा तलाई फीडर व टाउन फीडर शामिल हैं। पहले चरण में यहां पर फीडर से जुड़े 20 हजार 609 उपभोक्ताओं के घर स्मार्ट मीटर लगाने हैं। बिजली कंपनी के अनुसार इनमें से अब तक 9201 उपभोक्ताओं के घर पर मीटर लगाने का काम पूरा हो चुका है। जबकि 11408 घरों पर लगने शेष हैं।

ऐसे पकड़ रहे चोरी, एक महीने में 22 को पकड़ा

बिजली कंपनी के अनुसार कंपनी द्वारा जो स्मार्ट मीटर लगाए जा रहे हैं, वे सीधे इंदौर स्थित कंट्रोल रूम से जुड़े हैं। मीटर में कोई भी छेड़छाड़ की सारी जानकारी वहां बैठे अधिकारियों को मिल रही है। खंडवा शहर में स्मार्ट मीटर ने 20 उपभोक्ताओं को मीटर की सील तोड़कर उसमें डिवाइस लगाता पाया। जबकि 2 उपभोक्ता ऐसे थे जिनका लोड एक किलोवाट से अधिक मिला। इन अधिकारियों ने खंडवा स्थित कार्यालय में इसकी जानकारी दी। इसके बाद उस जोन के अधिकारी उन उपभोक्ताओं के घर पहुंचे और मीटर जब्त कर पंचनामा बनाया और 10 उपभोक्ताओं पर 10 लाख 87 हजार रु. का जुर्माना लगाया। 12 उपभोक्ताओं पर कार्यवाही की जाना शेष है।

रिमोट से ही कार रहे बिजली, उसी से जुड़ भी रही

बिजली कंपनी के शहर कार्यपालन यंत्री बीएल गुप्ता ने बताया स्मार्ट मीटर पूरी तरह से आधुनिक है। इसका संचालन रिमोट कंट्रोल से भी हो रहा है। जिस उपभोक्ता की चोरी पकड़ी जा रही है उसका कनेक्शन सीधे रिमोट कंट्रोल से ही काटा जा रहा है। आंशिक रूप से पैसा भरने पर नया मीटर लगाकर लाइन दोबारा चालू कर रहे हैं।

दैनिक इंदौर संकेत

इंदौर, मंगलवार, 13 अगस्त 2024

स्मार्ट मीटर उपभोक्ता संतुष्टि के लिए कारगर साबित

इंदौर • इंदौर संकेत प्रतिनिधि

डिजिटल इंडिया अभियान को प्राथमिकता देते हुए मप्र पश्चिम क्षेत्र विद्युत वितरण कंपनी स्मार्ट मीटर परियोजना का गंभीरता के साथ संचालन कर रही है। अब तक पश्चिम मप्र में सात लाख पांच हजार अत्याधुनिक स्मार्ट मीटर लगाए जा चुके हैं। ये स्मार्ट मीटर उपभोक्ता संतुष्टि की दिशा में मिल का पत्थर साबित हुए हैं। समय पर रीडिंग नहीं होने, बिल त्रुटिपूर्ण होने की शिकायतें भी काफी कम हो गई हैं।

मध्यप्रदेश पश्चिम क्षेत्र विद्युत वितरण कंपनी इंदौर के प्रबंध निदेशक अमित तोमर ने बताया कि वर्तमान में चौदह जिलों में स्मार्ट मीटरकरण जारी है। सात लाख पांच हजार स्मार्ट मीटर लगाए जा चुके हैं। ये मीटर पहली तारीख को रीडिंग अपने आप ले लेते है, इसी के आधार पर रीडिंग मानव हस्तक्षेप के बगैर दर्ज करने के बाद बिजली बिल तैयार हो जाता है। यह बिजली बिल इलेक्ट्रानिक माध्यमों से उपभोक्ताओं को मोबाइल पर तुरंत पहुंच जाता है। इससे बिजली बिल भरने के लिए पहले की तुलना में ज्यादा समय मिल रहा है। श्री तोमर ने बताया कि कंपनी क्षेत्र में सबसे ज्यादा तीन लाख से ज्यादा स्मार्ट मीटर इंदौर शहर में लगे है। इसके बाद मंडु, उज्जैन, नलाम, देवास, खरगोन व अन्य नगरीय क्षेत्रों में स्मार्ट मीटर लगाए गए है। उन्होंने बताया कि मोबाइल पर पश्चिम क्षेत्र कंपनी के ऊर्जस एप पर स्मार्ट मीटर से संबद्ध उपभोक्ता स्वयं के बिजली खाते से संबंधित जानकारी व दैनिक बिजली उपयोग विधिवत देख सकता है।

इस एप पर ऊर्जा बचत की जानकारी भी प्राप्त होती है। प्रबंध निदेशक तोमर ने बताया कि जिन नए शहरों, नए कस्बों, नए फीडरों से संबद्ध उपभोक्ताओं को स्मार्ट मीटर परियोजना से जोड़कर निःशुल्क स्मार्ट मीटर लगाए जा रहे है, वहां के उपभोक्ताओं की मांग पर और संतुष्टि के लिए अन्य मीटर(चेक मीटर) भी लगाए जा रहे है, ताकि उपभोक्ताओं का यह भ्रम दूर किया जा सके कि स्मार्ट मीटर तेज चलते हैं। प्रबंध निदेशक ने बताया कि कंपनी क्षेत्र में इंदौर शहर में सात सौ से ज्यादा और सभी जिलों में कुल मिलाकर 1200 चेक मीटर लगाए गए है। इनमें 99.50 प्रतिशत स्मार्ट मीटर और चेक मीटर की रीडिंग में समानता दर्ज हुई है। चेक मीटर एवं रीडिंग की समानता से संबंधित जानकारी जन प्रतिनिधियों, उपभोक्ता संगठनों, रहवासी संगठनों को भी विधिवत दी जा रही है।

स्मार्ट मीटर उपभोक्ता संतुष्टि के लिए कारगर साबित

चेक मीटर लगाकर उपभोक्ताओं का भ्रम कर रहे दूर

दबंग दुनिया ◆ इंदौर

डिजिटल इंडिया अभियान को प्राथमिकता देते हुए मप्र पश्चिम क्षेत्र विद्युत वितरण कंपनी स्मार्ट मीटर परियोजना का गंभीरता के साथ संचालन कर रही है। अब तक पश्चिम मप्र में सात लाख पांच हजार अत्याधुनिक स्मार्ट मीटर लगाए जा चुके है। ये स्मार्ट मीटर उपभोक्ता संतुष्टि की दिशा में मिल का पत्थर साबित हुए हैं। समय पर रीडिंग नहीं होने, बिल त्रुटिपूर्ण होने की शिकायतें भी काफी कम हो गई हैं।

मध्यप्रदेश पश्चिम क्षेत्र विद्युत वितरण कंपनी इंदौर के प्रबंध निदेशक अमित तोमर ने बताया कि वर्तमान में चौदह जिलों में स्मार्ट मीटरकरण जारी है। सात लाख पांच हजार स्मार्ट मीटर लगाए जा चुके हैं। ये मीटर पहली तारीख को रीडिंग अपने आप ले लेते है, इसी के आधार पर रीडिंग मानव हस्तक्षेप के बगैर दर्ज करने के बाद बिजली बिल तैयार हो जाता है। यह बिजली बिल इलेक्ट्रानिक माध्यमों से उपभोक्ताओं को मोबाइल पर तुरंत पहुंच जाता है। इससे बिजली बिल भरने के लिए पहले की तुलना में ज्यादा समय मिल रहा है। तोमर ने बताया कि कंपनी क्षेत्र में सबसे ज्यादा तीन लाख से ज्यादा स्मार्ट मीटर इंदौर शहर में लगे है। इसके बाद महू, उज्जैन, रतलाम, देवास, खरगोन व अन्य नगरीय क्षेत्रों में स्मार्ट मीटर लगाए गए है। उन्होंने बताया कि मोबाइल पर पश्चिम क्षेत्र कंपनी के ऊर्जस एप पर स्मार्ट मीटर से संबंद्ध उपभोक्ता स्वयं के बिजली खाते से संबंधित जानकारी व दैनिक बिजली उपयोग विधिवत देख सकता है। इस एप पर ऊर्जा बचत की जानकारी भी प्राप्त होती है।

प्रबंध निदेशक तोमर ने बताया कि जिन नए शहरों, नए कस्बों, नए फीडरों से संबंद्ध उपभोक्ताओं को स्मार्ट मीटर परियोजना से जोड़कर निःशुल्क स्मार्ट मीटर लगाए जा रहे है, वहां के उपभोक्ताओं की मांग पर और संतुष्टि के लिए अन्य मीटर (चेक मीटर) भी लगाए जा रहे है, ताकि उपभोक्ताओं का यह भ्रम दूर किया जा सके कि स्मार्ट मीटर तेज चलते हैं। प्रबंध निदेशक ने बताया कि कंपनी क्षेत्र में इंदौर शहर में सात सौ से ज्यादा और सभी जिलों में कुल मिलाकर 1200 चेक मीटर लगाए गए है। इनमें 99.50 प्रतिशत स्मार्ट मीटर और चेक मीटर की रीडिंग में समानता दर्ज हुई है। चेक मीटर एवं रीडिंग की समानता से संबंधित जानकारी जन प्रतिनिधियों, उपभोक्ता संगठनों, रहवासी संगठनों को भी विधिवत दी जा रही है।

Analysis performed by utilising the Smart Metering data (1/2)

MDM system generates various actionable MIS, utilising above data.

a. Consumption Based Analysis:

i. Hourly, Daily, Monthly, Quarterly and yearly consumption data is available for review.

ii. Abnormally Low Consumption report is available (current consumption lower than 50 % consumption of past 6 month average).

iii. Consumption lower than 50 % of last year same month consumption.

iv. Consumption lower than 50 % of previous month consumption.

v. Consumption lower than 50 % of consumption prior to installation of Smart meter.

vi. Night consumption Zero or less than 10 % of day time consumption in case of Domestic Connections.

vii. Zero consumption since long.

viii. Very Low consumption continuously (for 6 months and above).

Analysis performed by utilising the Smart Metering data (2/2)

b. Event Based Analysis:

15 major events which are built into the Meter itself (like power failure, earth loading, voltage missing, voltage unbalance, low voltage in any phase, over voltage in any phase, single wire operation, neutral disturbance, CT Open, Current unbalance, Current By-pass, Current Reversal, Low Power factor, Abnormal external magnetic influence, cover open) are analysed.

c. Data Based Analysis: Further Analysis of data is done through logic and algorithms built into MDM system like (i) Current without voltage, (ii) Mismatch in phase current and neutral current, (iii) Loading pattern analysis, (iv) Load factor less than 5 %, (v) Technical and Commercial Parameters examined on a Scoring Matrix (vi) Consumers which are disconnected for more than two months.

Impact of Smart Meter Consumption of Domestic consumer (June 23 & June 24)					
Circle Name	**No of Consumers billed <=100 Unit in June-2023**	**No of Consumer who was billed <=100 unit in June 23 and billed >100<=150 Unit in June-24**	**No of Consumer who was billed <=100 unit in June 23 and billed >150 Unit in June-24**	**No of Consumer billed >100<=150 Unit in June-23**	**No of Consumer who was billed >100<=150 unit in June-23 and billed >150 Unit in June-24**
BARWANI	9301	1948	2318	6424	2997
DEWAS	155	35	60	960	494
DHAR	183	17	22	157	31
INDORE CITY	18398	3367	6679	14075	7701
JHABUA	7923	1209	2240	4248	2042
KHANDWA	1597	264	246	1277	289
MANDSAUR	5097	961	1336	3621	1679
NEEMUCH	4769	1062	1303	3990	2170
RATLAM	1629	291	519	1640	885
SHAJAPUR	605	81	86	514	138
Grand Total	**49657**	**9235**	**14809**	**36906**	**18426**
% Conversion	**48.42 % Consumers are converted for more than 100 units**			**49.93% consumers are converted from more than 150 units**	
% Subsidy	**Overall 38.39 % Consumers are out from subsidy**				

Summary of Reports deployed at MDM

S. No.	Name of Report	S. No.	Name of Report	S. No.	Name of Report
1	LS data	22	NIGHT CONSUMPTION<=10% OF DAY (12-6) AM	43	3 PHASE VOLTAGE ANALYSIS (Voltage zero in any phase)
2	IP data	23	NIGHT ZERO CONSUMPTION (12-6) AM	44	EVENT ANALYSIS (Consolidated)
3	DP Data	24	ACTUALCON DROPBY75% @75 UNITKW (Last three month)	45	CURRENT WITHOUT VOLTAGE
4	Billing Data	25	LAST 6 Month Cons drop by 50% AVGKWH<INITIAL 30DAY	46	MD compare with LS
5	Event Data	26	Min Voltage report	47	Technical Analysis
6	HOURLY CONSUMPTION	27	IP=!IN	48	Commercial Analysis
7	DAILY CONSUMPTION	28	IN=0,IP=!0	49	TECHNO-COMM Analysis
8	DAYWISE BILLING	29	IP=0,IN=!0	50	DTR IP
9	Monthly Consumption Net	30	TOD ANALYSIS	51	DTR LS
10	Last 3 Month CONSUMPTION REPORT	31	100 UNIT KWH LAST NINE MONTH	52	DTR Event
11	MONTHLY CONSUMPTION	32	100 UNIT KWH LAST 6 MONTHS	53	DTR HOURLY LOAD
12	YEARLY CONSUMPTION	33	100 UNIT KWH LAST 3 MONTHS	54	DTR HOURLY CON.
13	PF<0.80	34	ZERO CONS.	55	DTR HOURLY KVA
14	S.L. VIOLATION	35	ZERO CONSUMPTION FOR LAST THREE	56	DTR Loading
15	MD>CD LAST THREE MONTHS	36	ZERO CONS FOR LAST 6 MONTHS	57	DTR Interruption
16	ABNORMAL HIGH CONS	37	ZERO CONS.FOR LAST 9 MONTHS	58	DTR SAIFI SAIDI
17	ABNORMAL LOW CONSUMPTION	38	ZERO CONS FOR 12 MONTHS	59	Loading unbalance
18	CONSUMPTION COMPARE SMLY	39	ZERO CONS.>12 MONTHS	60	Voltage unbalance
19	CONSUMPTION COMPARE W.R.T.LM	40	LF<5%LAST 6 MONTHS	61	DTR Health
20	Initial vs last 6 Month Consumption drop by 50 %	41	LF<5% LAST THREE MONTHS	62	Day Billing Effi.
21	initial vs last 12 Month Consumption drop by 50 %	42	3 Phase Current Analysis (Current zero in any phase)	63	Monthly BE

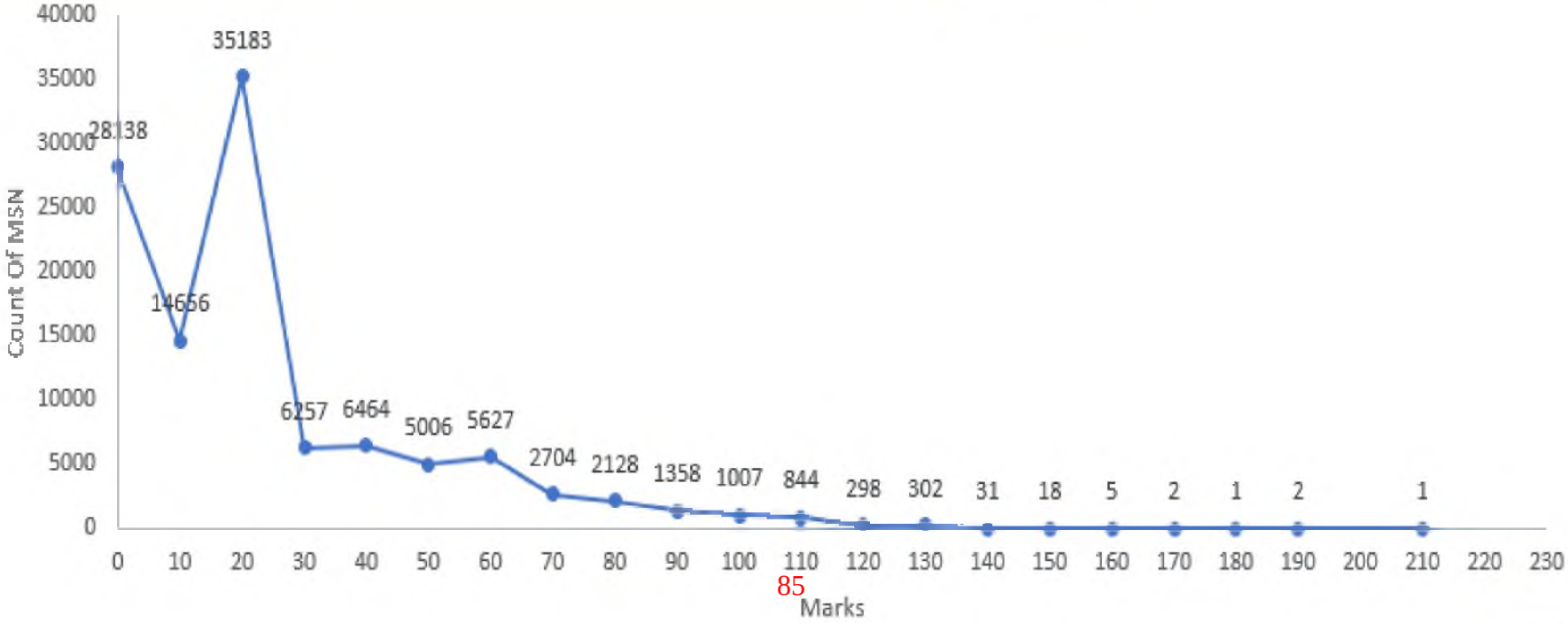
Technical Analysis Logics & Scoring

S.No.	Tiles	Tiles	Condition	Marks	Frequency
1	Magnet Event	Magnet Event	Instant	100	Daily
2	Cover Open	Cover Open	Instant	100	Daily
3	Current Without Voltage	Current Without Voltage	12 hours & above	50	Daily
4	Power failure	Power Fail	50 hours & above	30	Monthly
5	Voltage Missing	Voltage Missing	100 hours & above	20	Monthly
6	Voltage Unbalance	Voltage Unbalance	100 hours & above	10	Monthly
7	Low Voltage in any Phase	Low Voltage in any Phase	100 hours & above	10	Monthly
8	Over Voltage in any phase	Over Voltage in any phase	100 hours & above	10	Monthly
9	Single wire operation (neutral missing)	Single Wire Operation	12 hours & above	20	Monthly
10	Neutral disturbance	Neutral Distubance	12 hours & above	40	Monthly
11	CT Open in any phase	CT Open in any phase	12 hours & above	50	Monthly
12	Current Bypass	Current Bypass	12 hours & above	50	Monthly
13	Current Unbalance	Current Unbalance	12 hours & above	10	Monthly
14	Earth Loading	Earth Loading	12 hours & above	20	Monthly
15	Low PF	Low Power Factor	12 hours & above	10	Monthly
16	Ip≠In (Phase current is not equal to neutral current)	Ip≠In (Phase current is not equal to neutral current)	Event count ≥ 80% of IP count	50	Monthly
17	Ip=0 & In≠0 (Phase current is equal to zero & Neutral current is not equal to zero)	Ip=0 & In≠0 (Phase current is equal to zero & Neutral current is not equal to zero)	Event count ≥ 80% of IP count	50	Monthly
18	Ip≠0 & In=0 (Phase current is not equal to zero & Neutral current is equal to zero)	Ip≠0 & In=0 (Phase current is not equal to zero & Neutral current is equal to zero)	Event count ≥ 80% of IP count	50	Monthly
19	3 Phase current Analysis report	Shows zero current phase name & duration in hours in which current was zero for three phase	12 hours & above	20	Monthly
20	3 phase voltage Analysis report	Shows zerovoltage phase name & duration in hours in which voltage was zero for three phase	12 hours & above	20	Monthly
21	Consolidated Events	Sum of total Event Count	100 Nos & Above	30	Monthly
GR Total				750	Monthly

Commercial Analysis Scoring

Sr No	Tiles	Condition	Marks	
1	LF<5%	((Monthly Consumption*100)/(MD*Bill on Min))<5%	10	
2	LF<5% last 3 months	((Monthly Consumption*100)/(MD*Bill on Min))<5% From last three months	20	
3	LF<5% last 6 months	((Monthly Consumption*100)/(MD*Bill on Min))<5% from last 6 months	30	
4	Consumption compare last month	Current Month Consumption<50% of Last Month Consumption	20	
5	Consumption compare same month last year	Current Month Consumption<50% of same month last year Consumption	20	
6	Abnormal high	Current month consumption >=3*(avg of last six month consumption)	10	
7	Abnormal low	Current month consumption <=(avg of last six month consumption)/3	20	
8	Zero consumption	consumption is zero	20	Highest Marks Will be considered
9	Zero consumption for last 3 months	Consecutive last three month consumption is zero	10	
10	Zero consumption for last 6 months	Consecutive last six month consumption is zero	20	
11	Zero consumption for last 9 months	Consecutive last nine month consumption is zero	30	
12	Zero consumption for last 12 months	Consecutive last twelve month consumption is zero	40	
13	Zero consumption > 12 months	Consecutive last >12 month consumption is zero	50	
14	100 unit KWH from last 3 months continuous	Sum of last three month consumption <100	10	Highest Marks Will be considered
15	100 unit KWH from last 6 months continuous	Sum of last six month consumption <100	20	
16	100 unit KWH from last 9 months continuous	Sum of last nine month consumption <100	30	
17	last 6 months 50% average consumption <initial consumption	Last six month 50% of average consumption<Initial Consumption	30	
18	Night zero consumption	Consumption zero b/w 12 to 6 A.M.	50	
19	Night zero consumption 10%	12 to 6 A.M. Consumption <=10 % of rest hours consumption	20	
20	Last 6 Month Consumption	Current Month consumption drop by 50 % of average of last 6 Month Consumption	20	
21	Last 12 Month Consumption	Current Month consumption drop by 50 % of average of last 12 Month Consumption	20	
22	TOD Analysis report	In case of domestic consumer loading is less than 8 Hr average in a month	20	
23	Last three months Actual Consumption drop by 75% w.r.t.Sanction Load & M.D.(Assuming 1kw/75 unit)	Last three months Actual Consumption drop by 75% w.r.t.Sanction Load & M.D.(Assuming 1kw/75 unit)	30	
TOTAL			550	

Techno-Commercial Scoring Analysis



Benefits due to deployment of Smart Metering

Town/ Circle	Consumer Count	Smart to Non Smart			Smart to Non Smart			Average Monthly Per Consumer Improvement bill amount in Rs.
		Average Monthly Units Billed (Only for Consumers where smart meter is installed)		% of Improvement	Average Monthly Per Consumer current bill in Rs (Only for Consumers where smart meter is installed)		% of Improvement	
		After Smart Meter	Before Smart Meter		After Smart Meter	Before Smart Meter		
Indore City	200375	269.47	239.13	12.69%	2296.27	1936.02	18.61%	360.25
Mhow	13531	181.51	165.01	10.00%	1444.09	1060.99	36.11%	383.1
Khargone	31147	211.24	193.66	9.08%	1633.46	1322.95	23.47%	310.51
Ratlam	39800	206.04	192.6	6.98%	1698.58	1401.99	21.16%	296.59
Ujjain	53153	212.11	178.46	18.86%	1743.85	1264.42	37.92%	479.43
Dewas	27433	158.09	140.22	12.74%	1127	843.75	33.57%	283.25
Barwani	24315	166.31	124.44	33.65%	1147.44	739.23	55.22%	408.20
Jhabua	19461	151.25	128.97	17.28%	1101.86	864.26	27.49%	237.60
Mandsaur	13812	147.71	106.17	39.13%	86 1034.25	656.66	57.50%	377.59
Total	**423027**	**271.189**	**238.66**	**13.63%**	**2330.32**	**1918.58**	**21.46%**	**411.74**

Status of Bill Correction in Indore City (Jun-2024)								
Total Consumer as per Ledger (Jun-2024)	**Total Bill Correction**	**%**	**Non Smart Meter Consumer as per Ledger (Jun-2024)**	**Non-Smart Meter Bill Correction**	**%**	**Smart Meter Consumer as per Ledger (Jun-2024)**	**Smart Meter Bill Correction**	**%**
772405	3845	0.50%	498382	3679	0.74%	274023	166	0.06%

Challenges and Key learnings

Challenges & Key Learnings (1/3) : Discom Level

Sr	Issue	Possible Mitigation Measures
1	Project's sustainability	1. Discom's ownership is key to sustainability. 2. Dedicated Team required for SMCC.(Master & Mini)
2	Consumer Resistance for Installation of Smart Meters	1. Take local leadership persons in confidence. 2. Press Publicity about benefits of Smart Meters.
3	Proper management of Meter Replacement Process	1. Ensure integration of HES, CMDM and NGB systems before taking up installation of Smart Meters. ➢ Integrate Vendor's Meter Replacement system data with Discom's own meter replacement App/ Urjas Portal. ➢ Automate Meter Replacement data to NGB
4	Temporary outage of services of Telecom Service Provider	Two Different TSP Sims are to be installed on alternate/nearby Gateways for better redundancy. Learning comes from previously executed Indore city project and incorporated in new tenders.
5	RF v/s GPRS (RF communication has been executed in Indore City project, however in outskirts areas where consumer density is poor, meters are in non-communication because of poor coverage of canopy.	Use Mixed Communication Technology as per consumer density. Learning comes from previously executed Indore city project and incorporated in new tenders.
6	100 % in-house testing of Smart Meters before installation	Discom's Meter Testing Lab capacity has to be increased / enhanced and manpower made operational in Three Shifts so as to ensure 100 % testing of meters before installation. Same is not available in Indore City tender document and incorporated in new projects.
7	Quality Assurance	Sample submission before commencement of mass production.

Challenges & Key Learnings (2/3) : Field Level

Sr	Issue	Possible Mitigation Measures
1	Meters at contractor's premises	A proper meter movement mechanism should be maintained. No meter shall be available with Contractor at Night.
2	Damaged Service Cables	Ensure replacement of service cables also with meters. (Total 12717 Nos consumer's service cable replaced)
3	Meter Installed inside or in-appropriately	Rectify shortcomings at the time of installation of Smart Meters. (Total 9737 Nos Meter taken out from inside to outside)
4	3-phase meters installed without lugs may increase the burning of meters	Lugs be used mandatorily in case of 3-phase meters installation
5	Disputes Related with old accumulated readings.	Resolve with the help of previous photo readings and accumulation check
6	Accuracy of meter parameters during installation	1-phase meter Phase current and Neutral current value should be checked at the time of Installation. Phase wise current and voltages to be checked in case of 3 phase meters.
7	Quality of Work and Sealing of Meters	Ensure checking of quality and then only proper meter sealing at the time of installation by Discom Staff Only. Dedicated Team has to be provided by Discom.

Challenges & Key Learnings (3/3) : Field Level

Sr	Issue	Possible Mitigation Measures
8	Utilisation of Old Meter	Make arrangements for testing and then reinstallation of these meters for metering of unmetered / defective meters of consumers.
9	Meter Fast Complaints	To clear the doubts Smart meters to be installed in series with existing meters for comparison.
10	Supervision of consumers of Old removed Meters which is found Tampered at lab.	➢ Billing to be done ➢ Extra Flag in CMDM Software
11	Mitigation of common malpractices (Meter shunt, bypass, circuit etc), Aberration pointed out.	➢ Prompt action on aberrations pointed out by CMDM data analytics. ➢ Training for quality checking conducted to Field Teams
12	Checking of Disconnected consumers	Prompt checking of Disconnected Consumers is required in Night hours and necessary action has to be made against the consumer using unauthorized supply.
13	Benefits after deployment of Smart Meter	Discom has to freeze Feederwise Baselining & corresponding benefits after deployment of Smart Meters.

Before & After Smart Meter installation improvement

Circle/Division	Awarded Quantity	No of Smart Meter Installed		Before Smart Meter Installation				After Smart Meter Installation				% Improvement			
		Nos	% Wrt to Awarded Quantity	Billing Efficiency	Collection Efficiency	AT&C	CRPU	Billing Efficiency	Collection Efficiency	AT&C	CRPU	Billing Efficiency	Collection Efficiency	AT&C	CRPU
Indore	120000	120000	100%	66.5	81.57	45.76	4.89	91.4	99.62	8.95	6.73	24.9	18.05	-36.81	38%
Mhow	14999	14999	100%	76.05	80.18	39.02	5.38	90.57	100.07	9.37	7.21	14.52	19.88	-29.65	34%
Khargone	42868	42868	100%	81.13	94.09	23.69	5.09	88.79	102.82	8.74	6.7	7.66	8.73	-14.96	32%
Ratlam	83726	68615	82%	86.72	81.89	14.52	5.86	93.79	109.8	-3.12	7.39	7.07	27.91	-17.64	26%
Ujjain East	70136	40800	58%	64.52	62.89	59.43	4.33	80.56	94.53	23.84	5.78	16.05	31.65	-35.58	34%
Ujjain West	75232	36853	49%	59.72	70.91	57.65	3.50	71.60	94.26	32.51	5.52	11.88	23.35	-25.14	58%
Dewas	71691	42034	59%	66.13	84.98	43.8	3.63	83.16	93.33	22.39	4.55	17.37	8.51	-21.83	25%

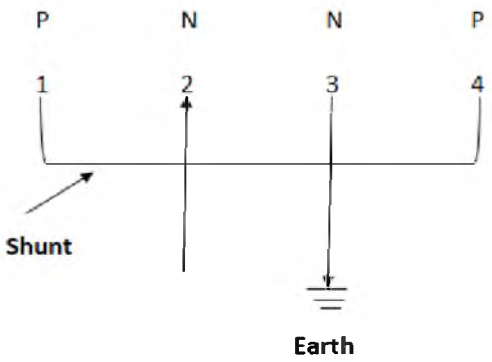
Note: Average of parameters of Feeders considered wherein Smart Meter installation completed more than 75%

SMART METER – SINGLE PHASE

10-60/100 A

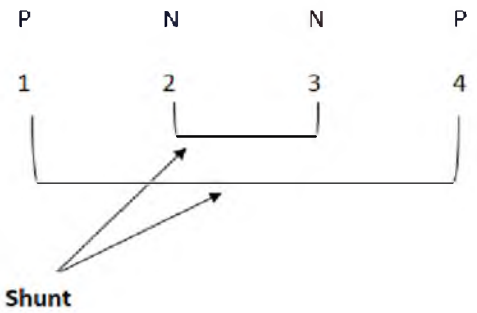
Tamper Condition:-

Shunt in between 1-4 terminal.
Result - Ip > 0 & In = 0



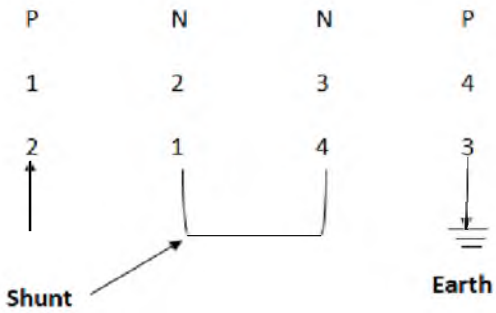
Tamper Condition:-

Shunt in Phase & Neutral
Result - IP ≠ IN



Tamper Condition:-

Interchange of P & N Wire.
Shunt in between 2-3 terminal.
Result - Ip = 0 & In > 0

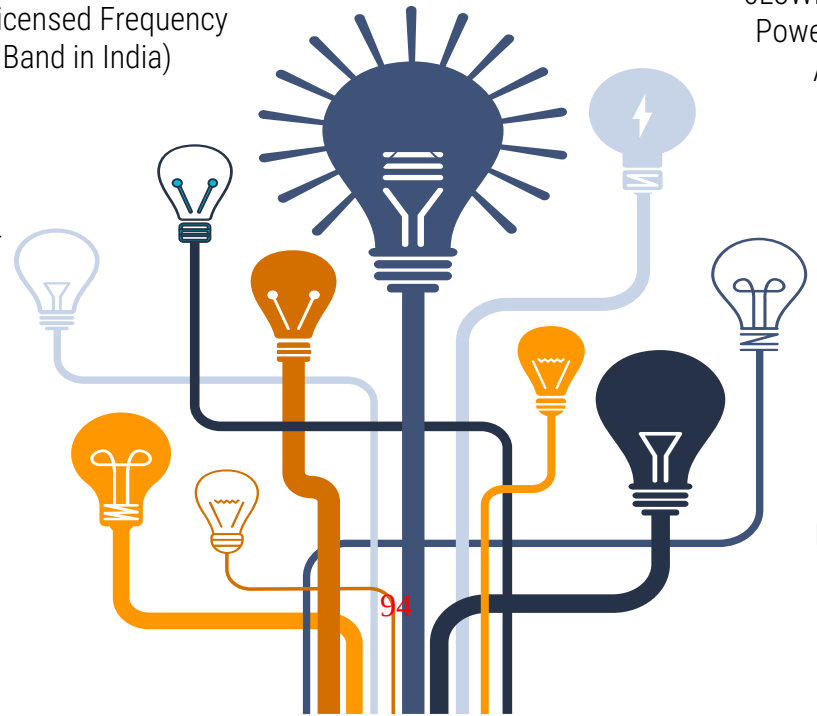


RF Mesh Canopy

Works on 865-867 MHz (Unlicensed Frequency Band in India)

6LoWPAN (IPv6 over Low - Power Wireless Personal Area Networks)

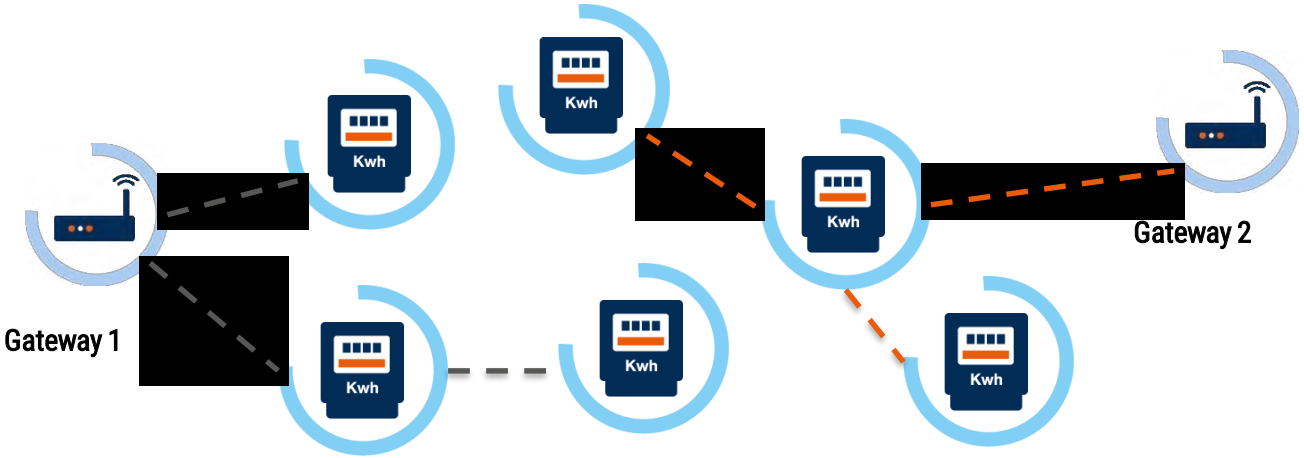
SLA are compliance to CEA Guidelines- (http://www.cea.nic.in/reports/others/god/dpd/ami_func_req.pdf)



Advanced Encryption Standard (AES)128 - Encryption

Datagram Transport Layer Security (DTLS) Protocol- Security Guarantees

Self-Forming RF Mesh Network



Self Forming

- End points learn from ‘neighbours’
- End points initiate communication

Intelligent Routing

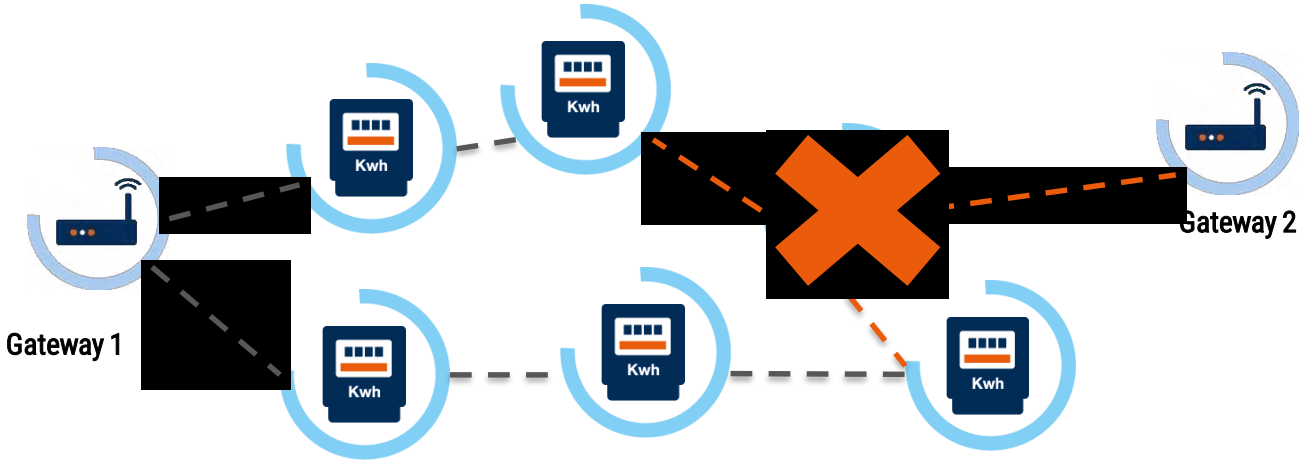
- End point ‘neighbour’ list
- Link budget
- RSSI, availability, layer

95

Fault Tolerant

- End points choose alternate path
- Load balancing

Self-Healing RF Mesh Network



Self Forming

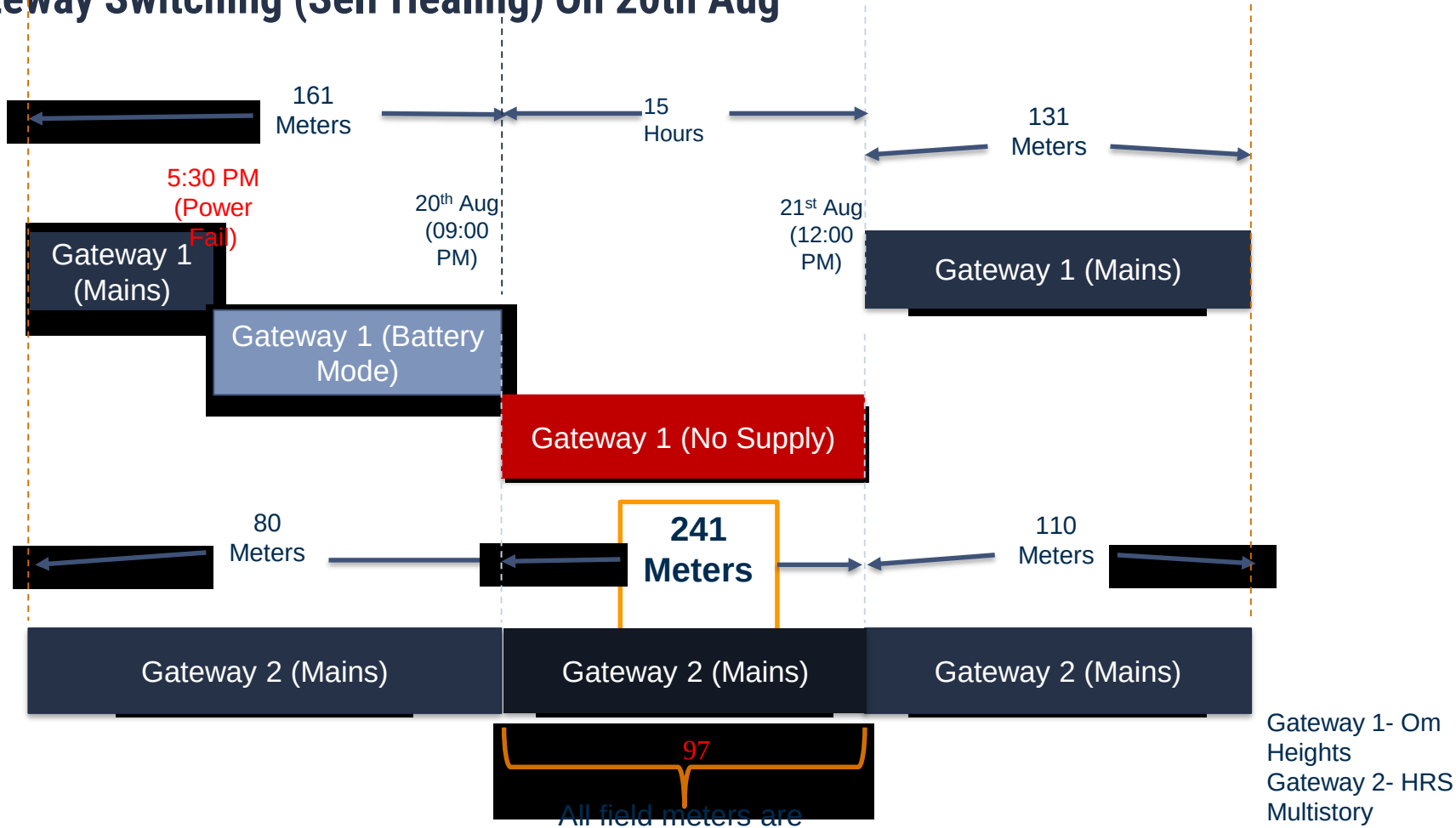
- End points learn from 'neighbours'
- End points initiate communication

Intelligent Routing

- End points 'neighbour' list (>150 neighbours maintained) 96
- Link budget
- RSSI, Availability, Layer

Fault Tolerant

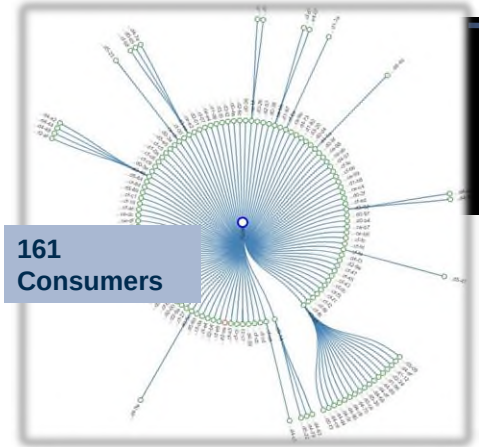
Gateway Switching (Self Healing) On 20th Aug



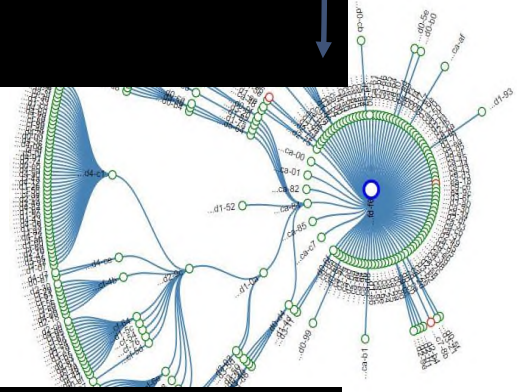
Gateway 1- Om Heights
Gateway 2- HRS Multistory

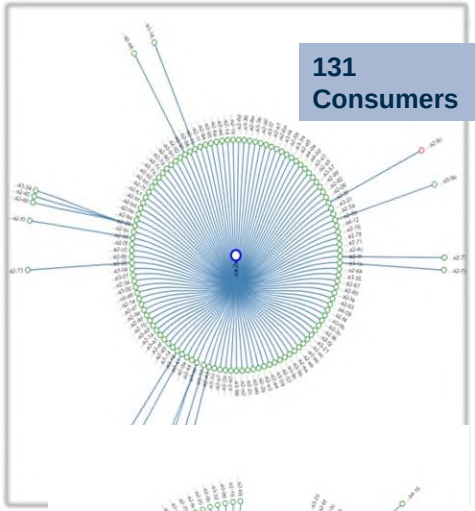
RF Mesh Networks : High Data availability SLAs case study

15 hours

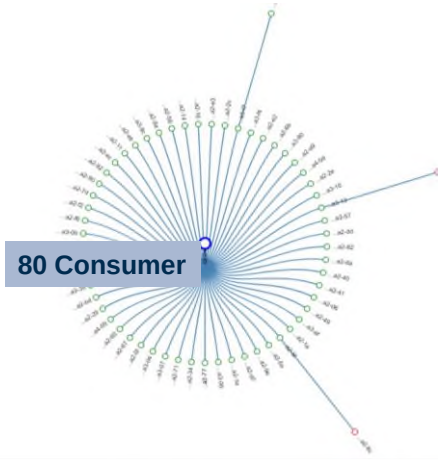


161 Consumers



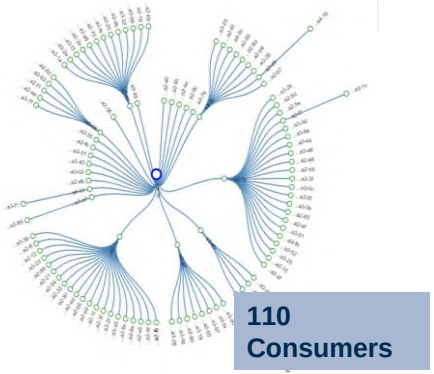


131 Consumers



80 Consumer

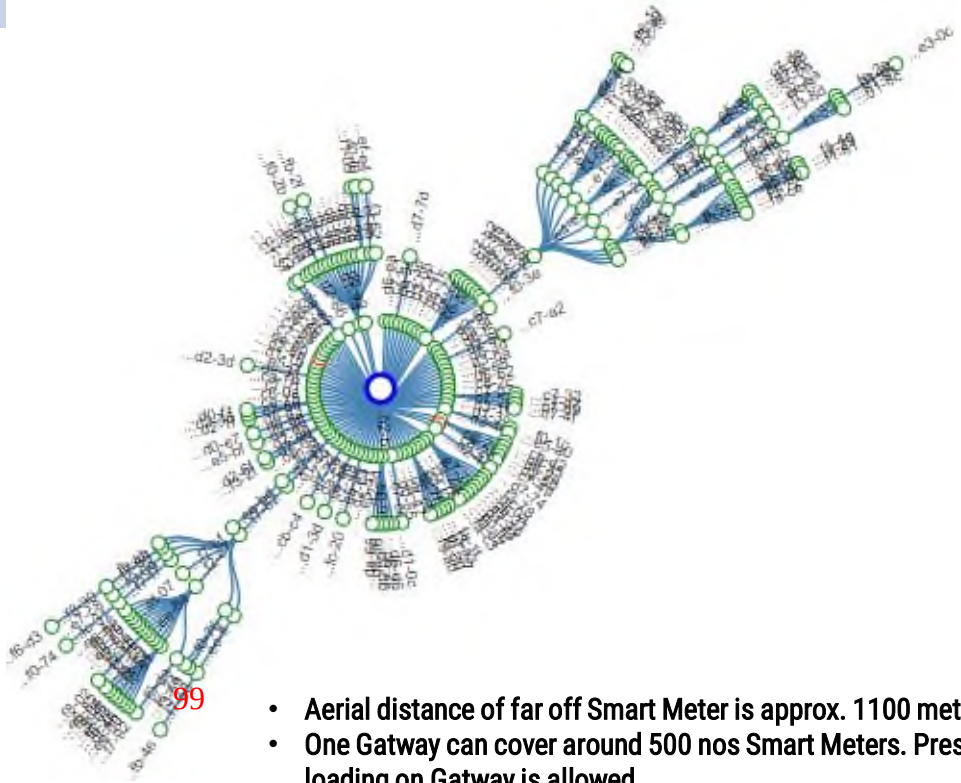
241 Consumers



110 Consumers

Local Adaptation After Outage On One Gateway

~9 Hop Mesh Network



99

- Aerial distance of far off Smart Meter is approx. 1100 meters.
- One Gatway can cover around 500 nos Smart Meters. Presently 50% loading on Gatway is allowed.

Annexure-IV

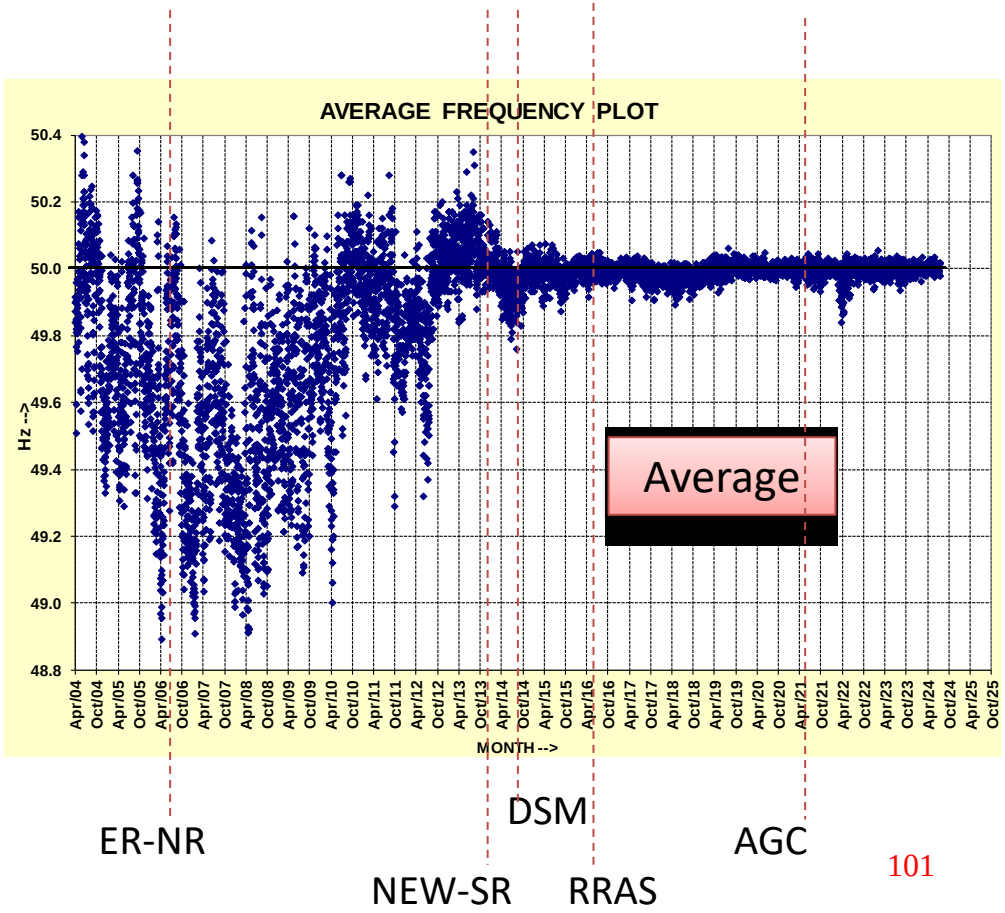
ग्रिड-इंडिया GRID-INDIA

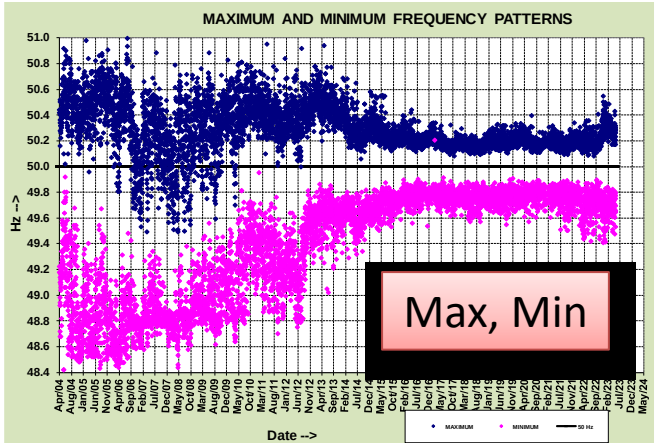
Secondary Reserve Ancillary Services (SRAS) for Intra-State Generating Stations

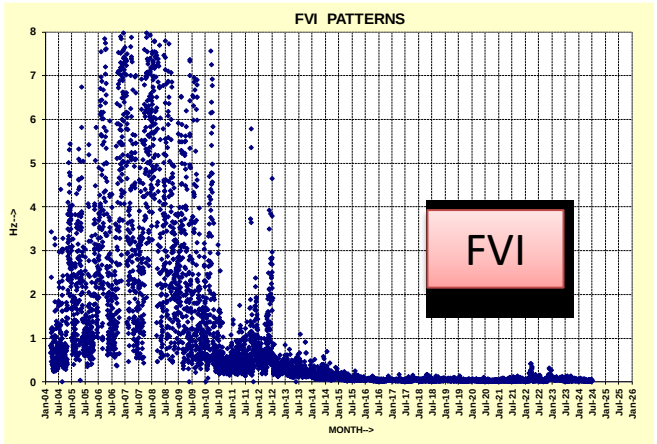
13 September 2024, Indore

100

Frequency Profile over the years…



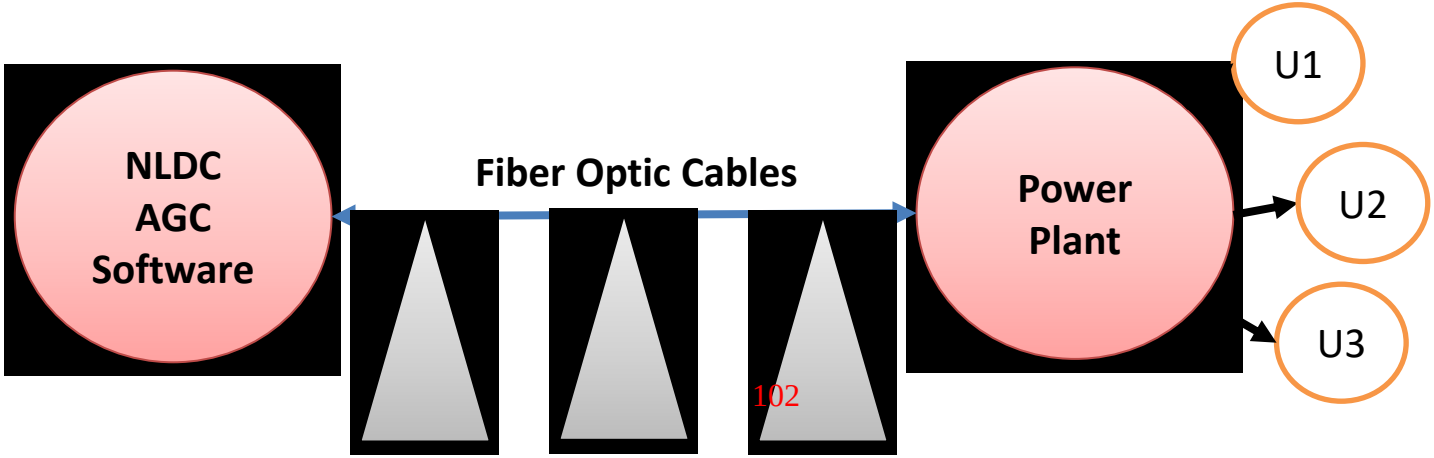




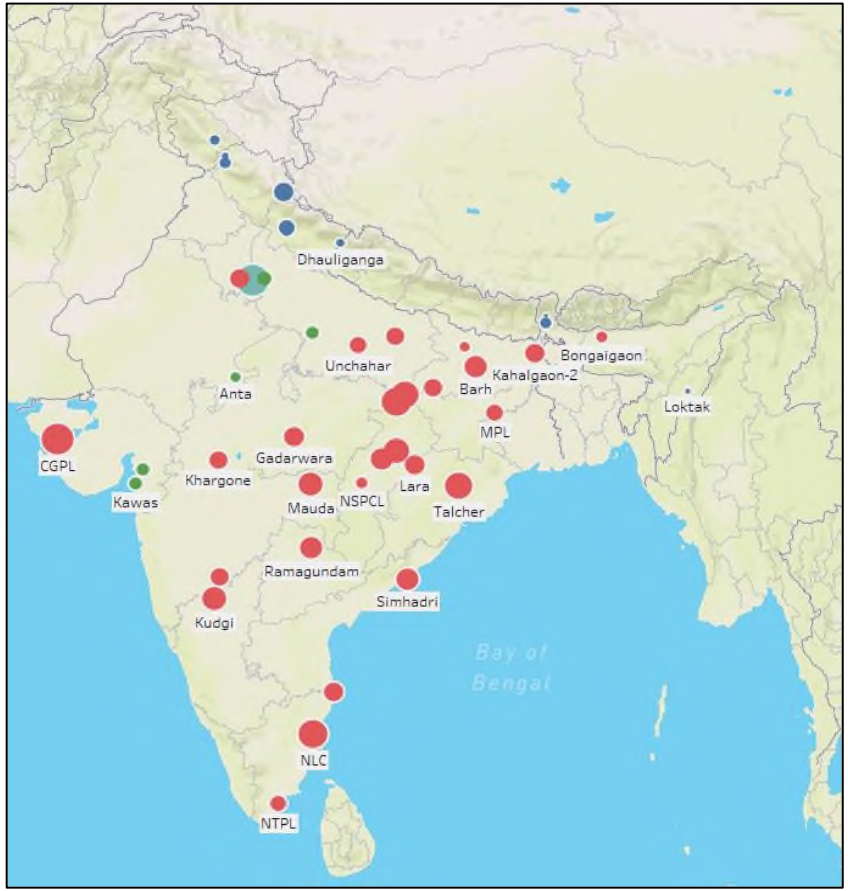
101

Automatic Generation Control (AGC) in Brief

- Automatic and supplementary control mechanism, 24x7
  - To control frequency and tie-line flows
- Several signals exchanged with generators every 4 seconds
- AGC will help replenish the exhausted primary reserves
  - Be ready for any next contingency
- Efficient and automatic frequency control during high RE periods
- AGC will improve the reliability of the Indian power system.



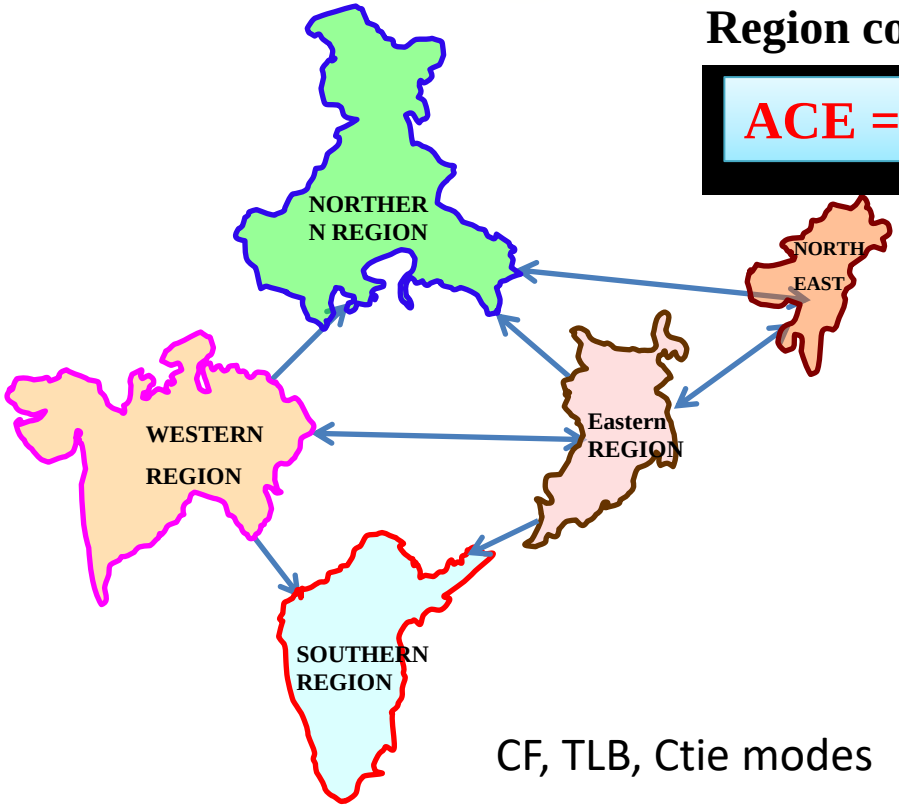
AGC Project Status



- Large size of the Indian power system
  - Pan India distributed
- 74 power plants with 72116 MW capacity under AGC, 196 units
  - 62.3 GW coal-based, 6.6 GW is hydro and 3.2 GW is gas-based.
- Far away plants operating in remote from New Delhi!
  - NTPL 2760 kms
  - Loktak 2500 kms
- Communication infrastructure planned by the Central Transmission Utility(CTUIL) utilized.
- Up & Down Regulation up to +/- 1500 MW-2000 MW pan-India

103

Area Control Error (ACE) Calculation



CF, TLB, Ctie modes

Region considered as an Area for secondary control

$$ACE = (Ia - Is) - 10 * Bf * (Fa - Fs) + Offset$$

- Ia = Actual net interchange in MW (positive for export)
- Is = Scheduled net interchange in MW (positive for export)
- Bf = Frequency Bias Coefficient in MW/0.1 Hz (negative value)
- Fa = Actual system frequency in Hz
- Fs = Schedule system frequency in Hz (default 50 Hz)
- Offset = Provision for compensating errors such as measurement error; default value zero
- ACE positive means area is in surplus and its internal generation has to back down
- ACE negative means area is in deficit and its internal generation has to increase

https://posoco.in/en/market/ancillary-services/english-frequency-bias-coefficient/

104

IEEE Task Force Report. 2017. "Measurement, Monitoring, and Reliability Issues Related to Primary Governing Frequency Response," Technical Report PES-R-24, October. https://resourcecenter.ieee-pes.org/publications/technical-reports/PESTECRPTGS0001.html

Balancing Reserves Dimensioning (2024-25)

Solar hours	Within State (MW)	ISGS (MW)	All India Total (MW)
With diversity benefit (limited up to reference contingency)	**12099**	**7577**	**19676**
Without diversity benefit	**17036**	**11330**	**28397**

Reserve Requirement reduces by up to 30% on all India basis with consideration of diversity benefits in estimation of reserves

Reference contingency for 2024-25 (7000 MW (for Solar hours) 4500 MW (for non- Solar hours)) published on NLDC website

Regulation and Energy Statistics

Actual Reserves Available for AGC from 74 power plants +/- 1000-1500

Chronic shortage of both Up reserves (non-solar) and Down reserves (solar)

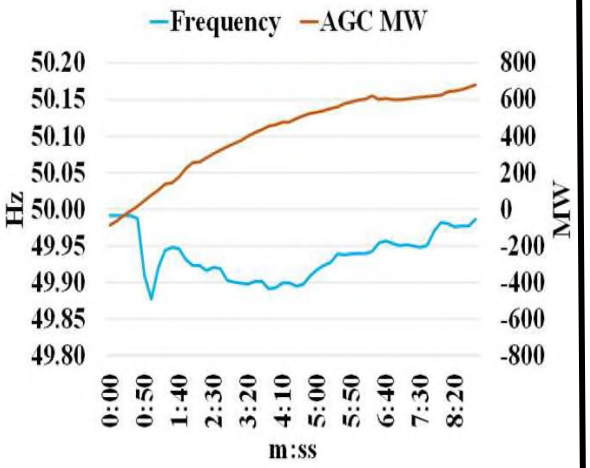
July 2021 – March 2024

Sno	Title	Value
1	Maximum Up Regulation MW	1751 MW
2	Maximum Down Regulation MW	2193 MW
3	Total Up Regulation MU; (a)	4882 MU
4	Total Down Regulation MU; (b)	(-) 11761
5	Total MU energy (+) delivered/ (-) absorbed; (a) + (b)	(-) 7019 MU
6	Total mileage; (c) = |a| + |b|	16503 MU
7	Total Mark-up/incentive disbursed	₹758 Cr
8	Maximum MW contribution during contingency	1400 MW
9	Maximum ramp contribution during contingency	240 MW/min

Services Offered by AGC

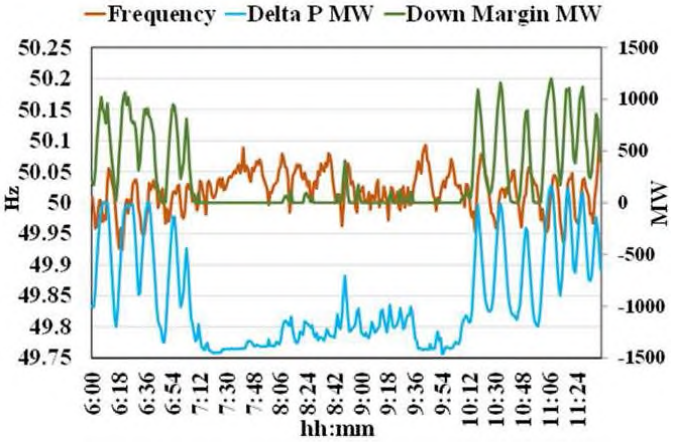
Service (1): Support during contingencies

During contingencies like generation loss or load loss, AGC quickly increases or decreases generation to restore the frequency to 50 Hz.



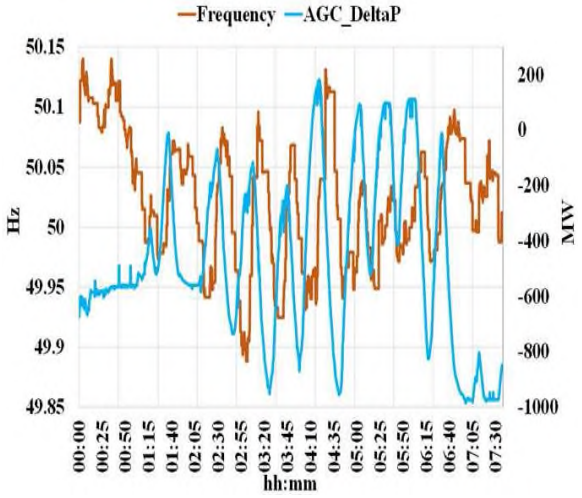
Service (2): Support during sustained frequency deviations

During sustained frequency deviations, AGC provides a sustained support of Up or Down, to the extent that spinning reserves are available under the AGC wired plants.



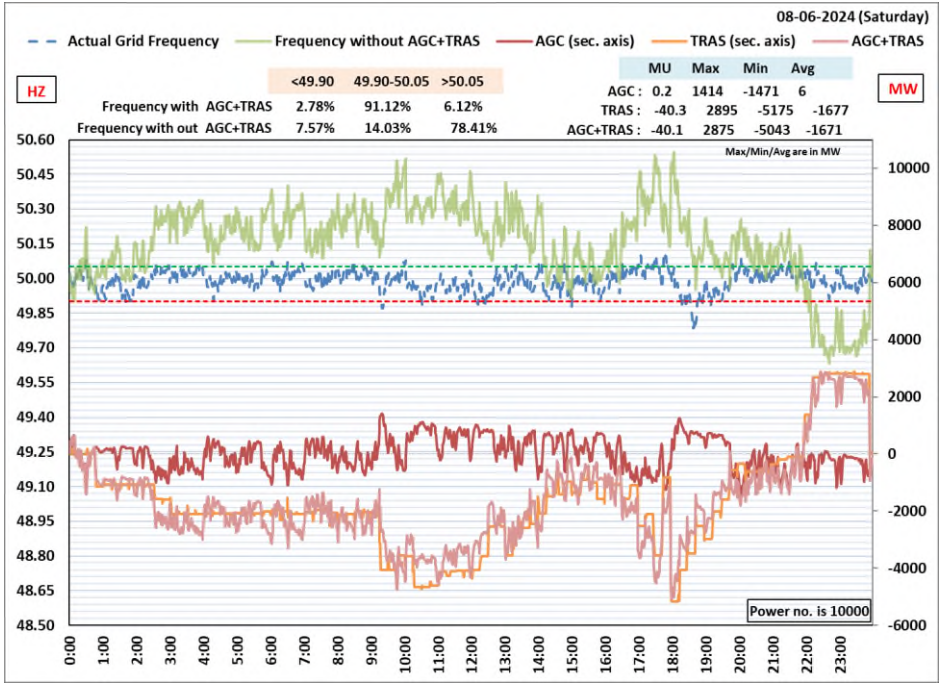
Service (3): Support during regular frequency changes

During periods when the grid frequency varies around 50 Hz, AGC increases or decreases the generation, intended to restrict the magnitude of frequency deviations.



Grid Operation with and without Ancillary Services

Best Frequency Profile Day – 08 June 2024



Sno	With & without Ancillary support	% time Frequency remained within the band (49.9 Hz – 50.05 Hz)	No. of 50 Hz crossings
1	**Without** Ancillary support	**14.0 %**	82
2	With TRAS support	50.0 %	271
3	**With** SRAS & TRAS support	**90.5 %**	459

Capacity for Up and Down Regulation

- Secondary Regulation is mainly capacity only
  - ❖ Net Energy over a large period of time is negligible
  - ❖ Pit head plants usually provide down regulation as up margin is available only for a limited time
  - ❖ Similarly, load centre plants provide Up regulation

- +/- 5% MCR typically offered under SRAS for Up and Down Regulation
  - ❖ A few plants offer +/-15% reserves

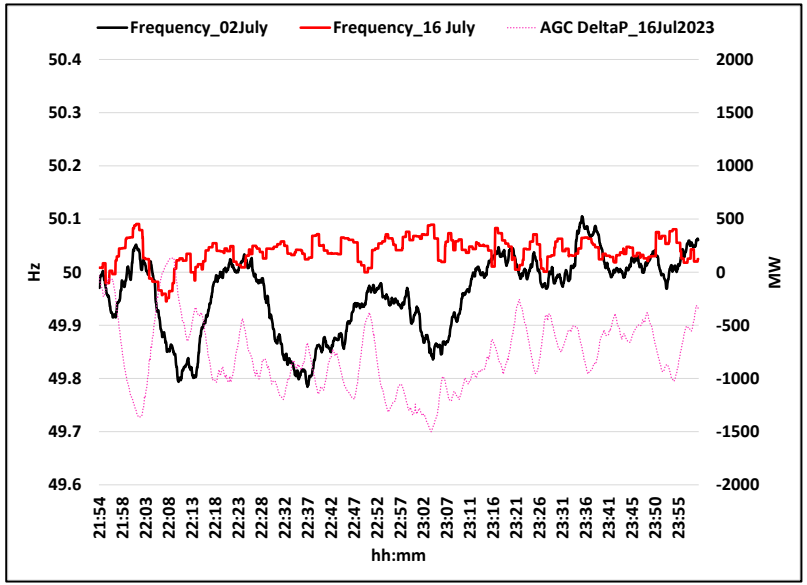
Sno	Plant	Up & Down (MU)	AGC Incentive (Rs. Crores)
1	Rihand-II	9 & 115	5
2	Mauda-I	60 & 87	5.7
3	MPL	36 & 147	9

Performance based incentives under CERC (Ancillary Services) Regulations, 2022

109

Expanding the Ambit of AGC

- AGC is playing a crucial role in enhancing frequency control and grid stability.
- Growing need for flexibility of conventional generation. Need to expand the ambit.
- CERC (Ancillary Services) Regulations, 2022 enables participation of IPPs and Intra-state generators under SRAS
- Regional Entity generators encouraged to join SRAS
- Intra-State AGC is an option for State entities
  - Intra-state generators can join SRAS if there is no-objection by the state
- Multiple workshops arranged for the stakeholders by Grid-India

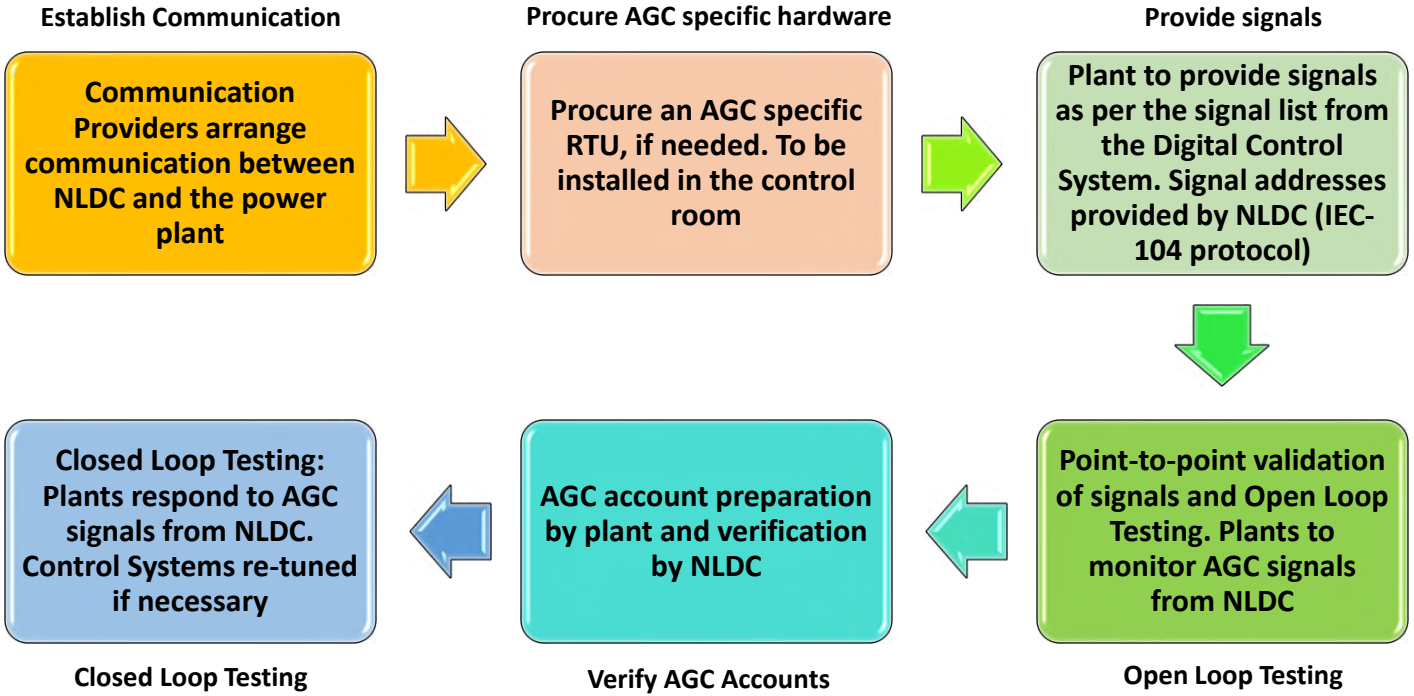


Frequency with and without AGC

10 workshops in FY 2023-24, 12 in 2022-23

110

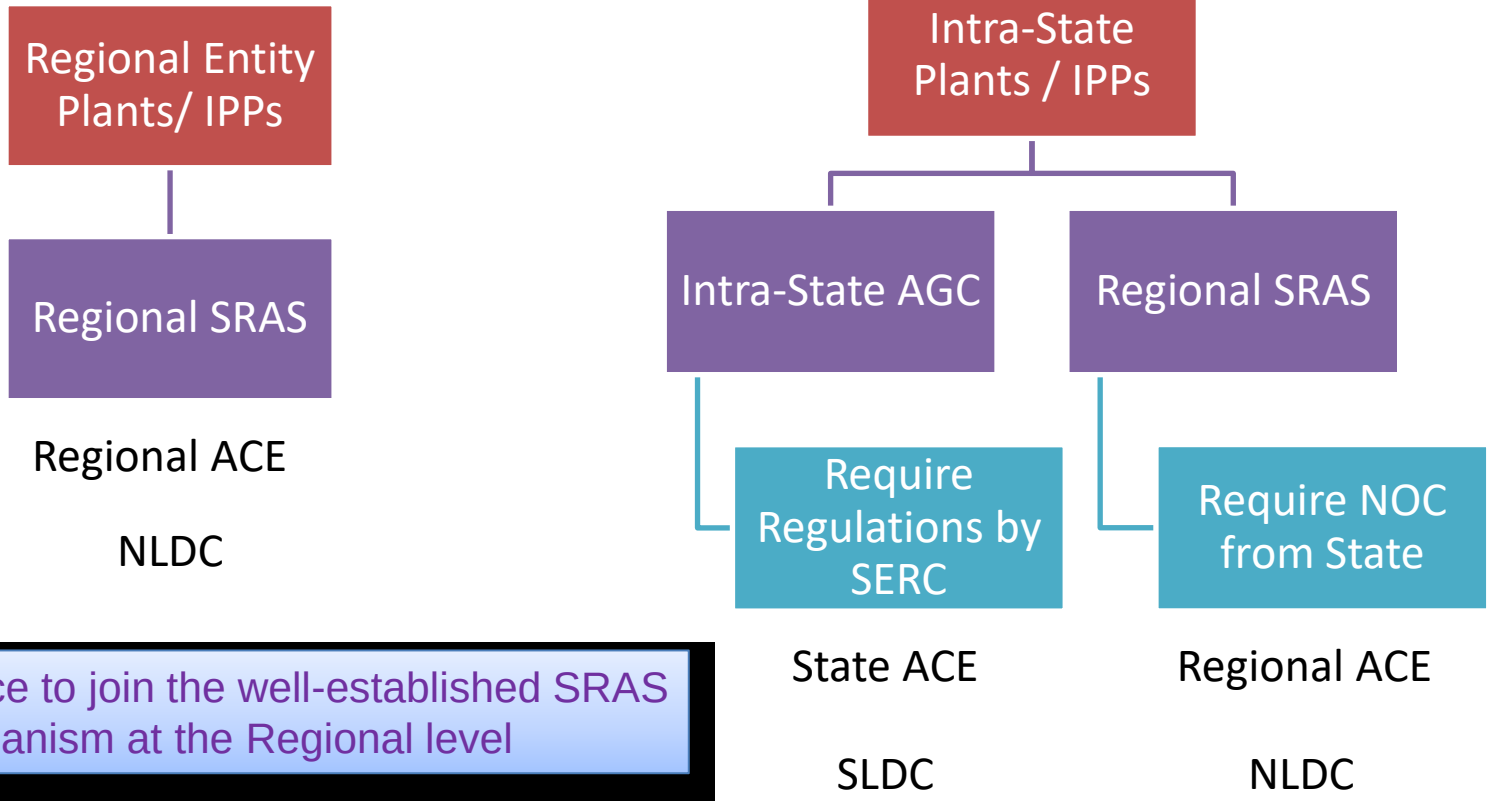
New Plant Integration Process



~ Total 72 GW Ready, 74 plants already on board

111

Options for Participation under AGC



Choice to join the well-established SRAS mechanism at the Regional level

Typical recovery of AGC investment by the plants through incentive in 6 months

Cost components in SRAS implementation

Sno	Cost component	Approximate Cost in (Rs. Crores)	Type of cost
1	RLDC/SLDC infrastructure	0.58 Cr / LDC	One-time SCADA/EMS upgrade
2	Dedicated RTU, Switches	1 Cr/plant	One-time purchase
3	Fiber optic	0.2 Cr/plant	One-time Distance based ~ 6Lakh/Km
4	Incentive for the plant under SRAS (based on historical performance statistics/records)	5 Cr. per plant per annum	Weekly performance based incentive. 40-50 paise/kWh CERC (AS) Regulations, 2022.

113

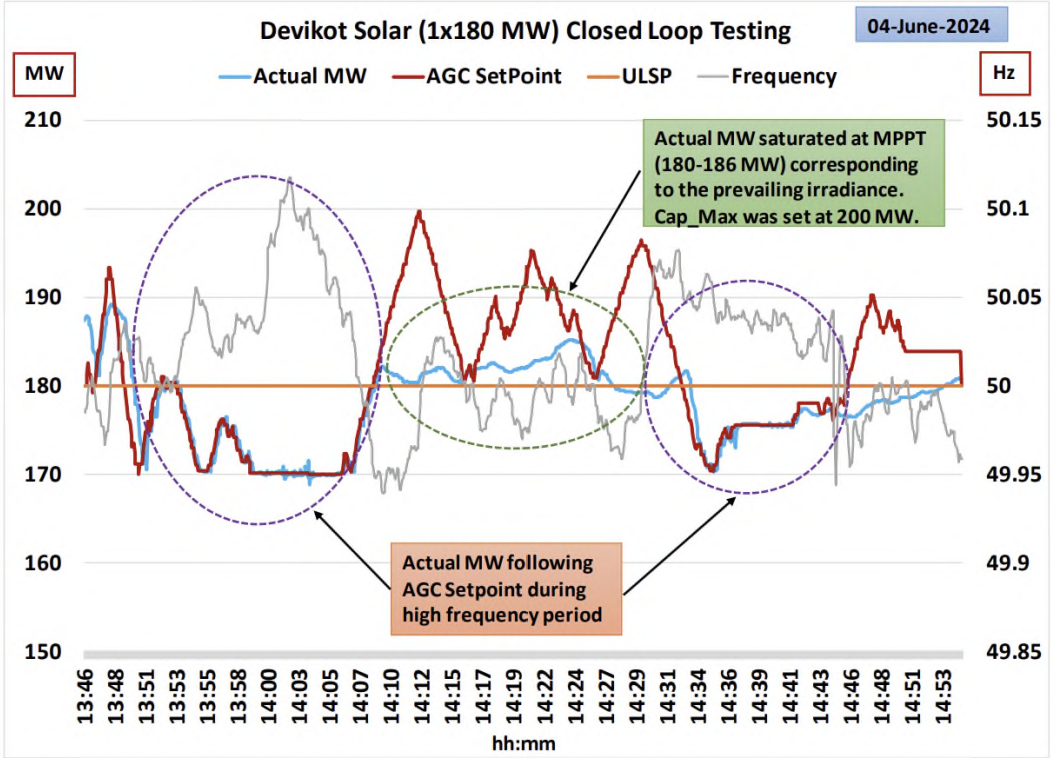
Intra-State SRAS Scheduling

Plant	DC MW	Schedule MW (a)	AGC MW (b)	Net Schedule MW (c) = (a)+(b)
Tiroda	3000	2500	100	2600
Chandrapur	3000	2200	200	2400
Total			300	

State	Drawl Schedule MW before AGC (d)	Net AGC MW (e) = sum (b)	Drawl Schedule MW after AGC (f) = (d)-(e)
Maharashtra	25000	300	24700

AGC Pilot project at Devikot Solar (180 MW)

- With high RE penetration, frequency control during high solar periods is a challenge
- Flexibility attributes needed from thermal power plants
- Down regulation to Solar plants may be the needed
- Efficient curtailment mechanism based on grid requirements
- Signal list ready
  - Sensitizing stakeholders
  - More pilots



Challenges and Way Forward

- Increasing the pool of AGC generators from the present central sector power plants to the state sector power plants
  - Choice to join the well-established SRAS mechanism at the Regional level
- Ongoing initiatives for AGC of Solar generation and Battery storage in India.
  - New technologies, demand response, hydrogen electrolyzers
- Low ramp rate declared by the coal-based power plants is a challenge
- Thermal power plants prefer to operate around the base schedule citing operation stability of thermal units due to constraints on boiler combustion side.
- Managing hydro forbidden zones and daily energy constraints is another challenge.
- Ensuring gas participation within small timelines.
- Liquidity of reserves in market based Ancillary Services

Thank You

Annexure-V

Presentation to Forum of Regulators

Best Practices

on

Subsidy Accounting & RPO Compliance

September 13, 2024

Indore

In this Presentation

Subsidy Accounting – Key Aspects

1. Subsidy Framework in various States
2. Section 65 of EA-2003 – Advance Subsidy
3. Simplification of Subsidy Structure
4. Estimation of Subsidy Impact
5. Payment of Subsidy
6. Reconciliation of subsidy disbursed and actuals.
7. Subsidy Transparency and Reporting

RPO Compliance – Key Aspects

1. RPO Targets and Eligible Sources
2. Applicability Conditions
3. Identification of Obligated Entities
4. Defining Consumption for RPO Computation
5. Data Reporting and Compliance Monitoring
6. Incentives and Penalty Mechanism

Based on the above Key Aspects – Best Practices being followed by several States have been brought out.
Further for better monitoring, formats have been prepared to monitor RPO Compliance and Subsidy Accounting.

Subsidy Accounting

Background……1/3

- Ministry of Power (MoP) under Electricity Act, 2003 sub-section (1) read with clause (z) of sub-section (2) of Section 176 has issued the **Forum of Regulators (Amendment) Rules, 2022** and **Electricity (Amendment) Rules, 2022** dated 08th September, 2022 and 29th December, 2022 respectively.

- In Rule 4(i)(b) of the Forum of Regulators (Amendment) Rule, 2022, the functions of the forum has been amended and Subsidy Accounting has been added to the functions of the forum. The relevant provision has been shown below:-

"…… …… …… ……
(b) Subsidy accounting –

*(i) **Preparation of the Quarterly Statements**, for each distribution licensee in the country, pointing out whether demands for subsidy are raised by distribution companies every quarter based on accurate accounts of the energy consumed by the subsidised category and the per unit subsidy payable, **and whether the said subsidy is paid under section 65 of the Act, gap in subsidy due and paid as well as other relevant details.***

(ii) Computation of subsidy due shall be in accordance with Standard Operating Procedure issued by Ministry of Power from time to time and this statement shall be submitted by the Forum to the Central Government and the concerned State Commission within thirty days from the end date of each quarter."

Background……2/3

- In Rule 15 of the Electricity (Amendment) Rules, 2022, it has been stated that the subsidy accounting by distribution licensee shall be in accordance with the **Standard Operating Procedure (SOP)** issued by the Central Government. Rule 15 as per Electricity (Amendment) Rules, 2022 has been reproduced below:-

  *"**Subsidy Accounting:** Accounting of due subsidy for the purpose of Section 65 of the Act, shall be done by the distribution licensee, in accordance with the Standard operating procedure issued by the Central Government, in this regard."*

- MoP in compliance with the Rule 15 of the Electricity (Amendment) Rules, 2022 issued SOP on subsidy accounting and payment on 3rd July, 2023.

- Thereafter, MoP in the **Electricity (Second Amendment) Rules, 2023** dated 26th July, 2023 issued amendment to the Rule 15 of the Electricity (Amendment) Rules, 2022 which is as follows:-

  "15. Subsidy accounting and payment :-

  1) *The accounting of the subsidy payable under section 65 of the Act, shall be done by the distribution licensee, in accordance with the Standard Operating Procedures issued by the Central Government, in this regard.*

     ……..

Background……3/3

"15. Subsidy accounting and payment :-

……..

2) *A quarterly report shall be issued by the State Commission for each distribution licensee, in its jurisdiction, giving findings whether demands for subsidy were raised by the distribution licensee in the relevant quarter based on accounts of the energy consumed by the subsidised category and consumer category wise per unit subsidy declared by the State Government, the actual payment of subsidy in accordance with section 65 of the Act and the gap in subsidy due and paid as well as other relevant details.*

   Explanation: For the purpose of this rule, (The term "Unit" means Kilo Watt Hour (kWh) or Kilo Watt (kW) or Horse Power (HP) or Kilo Volt Ampere (kVA), in accordance with the relevant Regulations or the Tariff Orders issued by the Appropriate Commission.

3) *The quarterly report shall be submitted by the distribution licensee within thirty days from end date of the respective quarter and the State Commission shall examine the report, and issue it with corrections, if any, in accordance with sub-rule (2), within thirty days of the submission.*

4) *In case the subsidy has not been paid in advance, then the State Commission shall issue order for implementation of the tariff without subsidy, in accordance with provisions of the section 65 of the Act.*

5) *If subsidy accounting and the raising bills for subsidy is not found in accordance with the Act or Rules or Regulations issued there under, the State Commission shall take appropriate action against the concerned officers of the licensee for non-compliance as per provisions of the Act."*

Subsidy Mechanism by State Governments

- There are three broad categories of subsidy mechanisms followed by the State Governments, which are as follows;
  1) The State Government declares the total subsidy for the financial year as a lump sum, which is factored into the Tariff Order determined by the State Commission. **[Few Examples: Goa and Arunachal Pradesh]**
  2) During the Tariff Order proceedings, the State Government specifies category-wise subsidies, and the State Commission incorporate such subsidies in the Tariff Order. **[Few Example: Andhra Pradesh, Telangana, Tripura, Manipur and Mizoram.] – Tariff determined without and without subsidy.**
  3) Once the State Commission issues the Tariff Order, the State Government specifies the category-wise subsidies in alignment with the approved Tariff Order. **[Example: Madhya Pradesh and few others]**

- **In this regard, provisions made by BERC is notable and is as follows:-**

  "35(a) The Commission shall determine the ARR and Tariff without considering subsidy.

  Provided that if the State Government declares subsidy for the categories of consumers after notification of Tariff Order, the licensee shall incorporate the same in the tariff and intimate the Commission with the revised Tariff Schedule that shall be charged if the subsidy is received in advance.

  Provided further that in case the State Government declares subsidy in advance or during tariff filing proceedings and the licensee incorporates the subsidy in the petition, the Commission shall notify two tariff schedules, one with subsidy and the other without subsidy."

Subsidy Monitoring - SERCs

- SERCs such as MERC, GERC, MPERC, TNERC and KERC have incorporated the provisions of the Electricity (Amendment) Rules, 2022 in Subsidy/Tariff Regulations.
- Some SERCs such as MERC, GERC, MPERC, TNERC, KERC, BERC, DERC, HPERC, APERC, and CSERC, have specified in Subsidy/Tariff Regulations or given directives in Tariff Order to the distribution licensees to submit quarterly report to the State Commission.
- However, quarterly reconciliation is not being done in many States.
- **One of the best practices followed for quarterly reconciliation of Subsidy examination is being followed in the State of Delhi where DERC appoints C&AG empaneled Auditor for Quarterly Reconciliation of Subsidy - Actual released / adjusted by GoNCTD and passed to consumers in their electricity bill.**
- **FOR needs to prepare quarterly statements for each distribution licensee and submit this information to the Central Government as per the format specified in SOP (already circulated to SERCs).**

For timely execution of work, and for better co-ordination on exchange of data it is requested that one nodal person from each Commission may be nominated.

Comparison of Subsidy Mechanism in some of the States

States	Energy Charge (Per unit basis)	Fixed/ Demand Charge (Rs./kVA or Rs./kW or Rs./Hp basis)	Free Electricity
Madhya Pradesh	✓	✓	✓
Andhra Pradesh	✓	✗	✓
Maharashtra	✓	✓	✗
Chhattisgarh	✗	✓	✓
West Bengal	✓	✓	✓
Goa/ Arunachal Pradesh	Budgetary Support from State Government		
Karnataka	✓	✓	✓
Punjab	✓	✗	✓
Bihar	✓	✓	✗
Uttar Pradesh	✓	✓	✗
Manipur	✓	✗	✗
Mizoram	✓	✗	✗
Telangana	✗	✗	✓
Tripura	✓	✓	✗
Tamil Nadu	✓	✓	✗
Delhi	✗	✓	✓

Subsidy Framework in various States…..1/3

State	Description
Madhya Pradesh	❖ For Domestic consumers from Scheduled Castes and Scheduled Tribes living below the poverty line, Subsidy is provided for 30 units of electricity at a rate of Rs. 25/- per month. ❖ For Domestic consumers with a monthly consumption up to 150 units, a subsidy is provided. For the first 100 units of consumption per month, domestic consumers are required to pay a maximum of Rs. 100 only. ❖ For permanent LT unmetered agricultural consumers with a capacity up to 10 HP or above 10 HP, the State Government provide subsidy at a flat rate per HP per year. ❖ For permanent LT metered agricultural consumers with a capacity up to 10 HP or above, the State Government provides a subsidy on a per-unit basis and waives the monthly fixed charges. ❖ Free electricity is provided to permanent agricultural pump consumers from Scheduled Castes and Scheduled Tribes with pumps up to 5 HP and land up to 1 hectare.
Andhra Pradesh	❖ The State Government of Andhra Pradesh has computed the subsidy for customers in the Domestic and Agriculture sub-categories on a per-unit basis. ❖ In Agriculture categories State Government of Andhra Pradesh has provided free power to Non-corporate farmers, Sugarcane crushing and Rural Horticulture Nurseries consumers.
Maharashtra	❖ The State Government of Andhra Pradesh has computed the subsidy for customers in the Domestic and Agriculture sub-categories on a per-unit basis. ❖ In Agriculture categories State Government of Andhra Pradesh has provided free power to Non-corporate farmers, Sugarcane crushing and Rural Horticulture Nurseries consumers. ❖ For LT and HT Powerloom category consumers, Government of Maharashtra has provided subsidy in Energy charge inclusive of wheeling charge on per unit basis whereas for LT Powerloom, LT Knitting, Hosiery & Garments category consumers under powerloom category has provided subsidy in Demand charge on Rs/kVA/Month basis.
Chhattisgarh	❖ Free electricity is applicable to Domestic BPL consumers and upto 5 HP pump set Agriculture consumers. ❖ For Domestic consumers irrespective of slabs have been provided 50% flat rate discount on the applicable tariff rate on consumption utpo 400 units.

127

Subsidy Framework in various States…..2/3

State	Description
Delhi	❖ Domestic Consumers(Residential)-100% electricity subsidy upto 200 Units and from 201-400 Units Rs.800 subsidy per month. ❖ Agriculture Consumers-Electricity subsidy on fixed charge @105/kW/month. ❖ 1984 Sikh Riots Victims-100% electricity subsidy up to 400 units per month, after 400 Units electric charge will be applicable as per Tariff Order.
Karnataka	❖ For Domestic (Bhagya Jyoti/ Kutir Jyoti) consumers upto consumption of 40 Units per month and Agricultural (Irrigation Pump Set upto 10 HP) consumers are provided subsidy in terms of free electricity.
Punjab	❖ Domestic Consumers- Free Electricity upto 300 Units and concessional tariff of Rs. 2.50 per unit is provided in energy charges for the consumers having load upto 7 kW. ❖ Agriculture Pump Consumers- Subsidy is provided in terms of free electricity ❖ Small Power Consumers- Concessional Tariff @ Rs. 5.50 per kVAh for 2.5 months and @ Rs. 5.665 per kVAh for 9.5 months along with full waiver of fixed charge. ❖ Medium Supply Consumers- Concessional Tariff @ Rs. 5.50 per kVAh for 2.5 months and @ Rs. 5.665 per kVAh for 9.5 months along with 50% waiver in fixed charge. ❖ Large Supply Consumers - Concessional Tariff @ Rs. 5.50 per kVAh for 2.5 months and @ Rs. 5.665 per kVAh for 9.5 months.
Bihar	❖ For Domestic , Non-Domestic, LT Industrial, HT General and HT Industrial consumers, Government has provided subsidy on energy charge, on per unit basis. ❖ For Irrigation & Allied services and "HAR GHAR NAL YOJANA", Government has provided subsidy on both demand charges(Rs/hp/month basis) and electricity charges(Rs/kWh basis).
Uttar Pradesh	❖ For LMV-1 type category consumers, Government has provided subsidy for Lifeline (Rural and Urban) and Rural Schedule Metered sub-category consumers on energy charge, per unit basis and for Rural Schedule Unmetered on demand charges, Rs./kW/month basis. ❖ For LMV-5 type category consumers, Government has provided subsidy on demand charges, Rs./BHP/Month basis.
Goa	❖ For Electricity Department of Goa (EDG) subsidy is provided in terms of budgetary support

Subsidy Framework in various States…..3/3

State	Description
Manipur/Mizoram	❖ The State Government of Manipur is providing a subsidy on energy charges, per unit basis to all categories of consumers.
Telangana	❖ The State Government of Telangana is providing 200 units of free electricity for eligible domestic consumer under "Gruha Jyoti Scheme". ❖ DISCOMS will send to Government, the details of subsidy to be received against Gruha Jyothi scheme by 20th of the month immediately following the month of consumption
Tripura	❖ The State Government of Tripura is providing a subsidy on energy charges, per unit basis, except Kutir Jyoti Consumers. For Kutir Jyoti Consumers , Government has provided subsidy, on Rs./Connection/Month basis. ❖ For Non-Domestic/Commercial & Bulk Supply category customers, Government has not provided any subsidy.
Tamil Nadu	❖ Domestic(LT-IA)- Consumption has divided in two slabs, first for bimonthly consumption up to 500 units and second for bimonthly consumption above 500 units. Government has provided subsidy on energy charges, per unit basis. ❖ Hut(LT-IB)- For Unmetered consumer ,Government has provided subsidy on fixed charges, Rs./Month/service basis while for Metered consumer, Government has provided subsidy on energy charges, per unit basis. ❖ Places of Workship(IIC)-Government has provided subsidy on energy charges, per unit basis, for bimonthly consumption upto 120 Units. ❖ Powerloom (LT-IIIA2)- Consumption has divided in five slabs, first for bimonthly consumption up to 500 units, second for bimonthly consumption above 500 units, third for bimonthly consumption above 750 units, fourth for bimonthly consumption above 1000 units and fifth for bimonthly consumption above 1500 units.. Government has provided subsidy on energy charges, per unit basis. ❖ Agriculture(LT-IV)-For Unmetered consumer ,Government has provided subsidy on fixed charges, Rs./HP/year basis while for Metered consumer, Government has provided subsidy on energy charges for all units, per unit basis.
West Bengal	❖ Under the Scheme name "HASIR ALO" Lifeline Domestic consumers are provided free electricity upto consumption of 75 Units per quarter. ❖ For Rural and Urban Domestic consumers and Irrigation Agriculture consumers having monthly consumption upto 300 unit under WBSEDCL are provided subsidy in Fixed Charges on Rs./KVA/ month basis and Energy Charge on per unit basis..

Subsidy Monitoring – Formats

In Order to fulfill the mandate of subsidy monitoring, a format has been circulated which if updated timely will enable FOR to fulfill the mandate as stipulated in the FOR (Amendment) Rules, 2022.

Format for Subsidy Billing and Collection (Quarterly Submission)

State/UT:
DISCOM/PD:
Date of Subsidy Bill to State Govt:

Reporting Quarter:
Copy of Subsidy Bill: Yes/No

S.No	Consumer Category	Subsidy declared by State Govt.			Total Energy forecasted for the category	Advance Subsidy Amount				Total advance subsidy amount released by the State Govt	Actual electricity supplied based on measurement through meters	Actual Subsidy Amount				Difference in advance released & actual subsidy required and raised to State Govt.	Reconciled Amount released by the State Govt.
		Subsidy on Energy Charges-Per unit basis	Subsidy on Fixed Charges	Subsidy on other Variable Charges (if any)"		Based on Energy Charge computed	Based on Fixed Charges	Based on other Variable Charges"	Total advance subsidy amount raised to the State			Based on Energy Charge computed	Based on Fixed Charges	Based on other Variable Charges"	Total actual subsidy required from the State Govt.		
		Rs/kWh	Rs/kW or other (please specify)	Rs/kWh or other (please specify)	MUs	Rs. Crore	Rs. Crore	Rs. Crore	Rs. Crore	Rs. Crore	MUs	Rs. Crore	Rs. Crore	Rs. Crore	Rs. Crore	Rs. Crore	Rs. Crore
1	2	3	3A	3B	4	5=3*4	6	7	8=5+6+7	9	10	11=3*10	12	13	14=11+12+13	15=9-14	16
1	**Domestic**																
1.1	Domestic-1																
1.2	Domestic-2																
1.3	Domestic-3																
2	**Commercial**																
2.1	Commercial-1																
2.2	Commercial-2																
2.3	Commercial-3																
3	**Industrial**																
3.1	Industrial-1																
3.2	Industrial-2																
3.3	Industrial-3																
4	**Agricultural**																
4.1	Agricultural-1																
4.2	Agricultural-2																
4.3	Agricultural-3																
5	**Other**																
5.1	Other-1																
5.2	Other-2																
5.3	Other-3																

"Subsidy on other variable charges may include any other subsidy declared by State Government on Electricity taxes, Fuel and Power Purchase adjustment charges, any other surcharges, etc.

Note:- Details of applicable late payment surcharge (as per para xvi) for a quarter to be paid by State Government and balance, if any, shall be recorded in the subsequent advance monthly/quarterly assessment demand raised to State Government.

Monitoring of Renewable Purchase Compliance

Background

- Ministry of Power (MoP) under Electricity Act, 2003 sub-section (1) read with clause (z) of sub-section (2) of Section 176 has issued the **Forum of Regulators (Amendment) Rules, 2022** dated 08th September, 2022.

- In Rule 4(i)(c) of the Forum of Regulators (Amendment) Rule, 2022, the functions of the forum has been amended and Subsidy Accounting has been made functions of the forum. The relevant provision has been shown below:-

  "… … … …
  (c) Monitoring of renewable purchase compliance-

  (i) ***The compliance of targets, by each of the distribution licensees, captive consumption and consumers procuring power through open access, for purchase of electricity from renewable sources as determined by the Central Government or by State Commission, whichever is higher,*** *in accordance with the provisions of the Act and rules, regulations, guidelines made thereunder.*

  (ii) An annual report comprising data and analysis thereof for compliance of the targets for purchase from renewables shall be submitted to the Central Government by 31st May of next financial year."

- In this regard, FOR is required to submit an annual **Renewable Purchase Compliance** report comprising of data and analysis on the compliance with renewable purchase obligations by Obligated entities. **This report has to be provided to the Central Government by May 31st of the subsequent financial year.**

RPO TARGETS

- *Till FY 2019-20 - SERCs have been specifying RPO targets – (Solar and Non-Solar under Section 86(1)(e) of the EA-03.*
- *MoP, GoI for the first time on 29.01.2021 introduced Hydro Power Obligations (HPO) while also specified the target for Solar and Non-Solar RPO.*
- *In the following year, on 22.07.2022 MoP introduced energy Storage Obligation, Wind RPO and did away with specific Solar RPO. MoP also revised the targets till FY 2029-30.*
- *This further underwent change by Notification dated 20.10.2023 issued by MoP, GoI under Energy Conservation Act, 2001 wherein Distributed Energy Component was introduced, and Energy Storage Obligation was removed. The targets were also revised from 01.04.2024.*
- *In addition to the targets, the eligible projects that were allowed to meet Wind RPO and HPO also underwent change.*
- *To incorporate the above changes, amendments to the existing targets were notified by several SERCs.*

133

RPO TARGETS

- ***Targets as per Notification dated 20.10.2023 - specified in terms of percentage of their total share of energy consumption.***

Sr. No	*Year*	*Wind Renewable Energy*	*Hydro Renewable Energy*	*Distributed Renewable Energy**	*Other Renewable Energy*	*Total Renewable Energy*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
1	*2024-25*	*0.67%*	*0.38%*	*1.50%*	*27.35%*	***29.91%***
2	*2025-26*	*1.45%*	*1.22%*	*2.10%*	*28.24%*	***33.01%***
3	*2026-27*	*1.97%*	*1.34%*	*2.70%*	*29.94%*	***35.95%***
4	*2027-28*	*2.45%*	*1.42%*	*3.30%*	*31.64%*	***38.81%***
5	*2028-29*	*2.95%*	*1.42%*	*3.90%*	*33.10%*	***41.36%***
6	*2029-30*	*3.48%*	*1.33%*	*4.50%*	*34.02%*	***43.33%***

**For hilly and North-Eastern States/Union Territories, namely Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Jammu & Kashmir, Ladakh, Himachal Pradesh and Uttarakhand, the distributed renewable energy component shall be half of that given in the Table and the remaining component for these States shall be included in the other renewable energy sources.*

RPO TARGETS

Particulars	SERCs
MoP Order dated 22.07.2022 (Amendment dated 19.09.2022)	AERC, BERC, CSERC, DERC, HERC, HPERC, KSERC, MPERC, JERC (Manipur & Mizoram), RERC, TNERC, UERC,
MoP Notification dated 20.10.2023	JERC(Goa &UT), J&K, MERC and JSERC.
Others	GERC, KERC, OERC, NERC, APERC, TERC, UPERC and WBERC

- ***12 SERCs have incorporated both HPO and Wind targets as required by Notification dated 22.07.2022.***
- ***4 SERCs have incorporated the HPO and Winds targets as required by Notification dated 20.10.2023.***

OBLIGATED ENTITIES – APPLICABILITY CONDITIONS

- *In many States like Chhattisgarh, Maharashtra, Telangana, the RPO regulations and its compliance is mandatory for all DISCOMs, captive consumers (with installed capacity of 1 MW and above) and open access consumers (1 MW and above) referred as Obligated Entities.*

- *However, few states like Haryana and Jharkhand consider captive consumers having capacity 5 MW and above as obligated entities .*

- *Further, all SERCs have aligned their Regulations with the Green Open Access Rules where the threshold of availing Open Access have been lowered to 100 kW and have placed no load limit for captive transactions.*

- *There is a need of having a common benchmark in terms of applicability of RPO targets on Open Access & Captive Consumers. In this regard, MNRE and FoR can build consensus among States on what the benchmark should be and the same could be followed by all States.*

CONSUMPTION FOR RPO COMPUTATION

- *"Consumption" means the annual electricity/ energy consumption by an obligated entity on basis of which the RPO targets and compliance will be calculated for that entity for that financial year.*
- *Presently, the definition of consumption varies across States.*

Approach	States
Total Sale of Power	Delhi
Total Consumption	Andhra Pradesh, Bihar, Goa, Himachal Pradesh, J&K, Jharkhand, Chhattisgarh, Manipur, Mizoram, Nagaland, Punjab, Rajasthan, Tamil Nadu
For Non-Solar – Total consumption including T&D losses and for Solar RPO – Total consumption excluding Hydro power including T&D	Arunachal Pradesh
Total Consumption excluding T&D losses	Gujarat, Sikkim,
Total Consumption excluding consumption met from hydro sources and RE sources	Haryana, Telangana
Total Consumption excluding hydro sources	Assam, Kerala, Meghalaya, Odisha, Tripura ,Uttar Pradesh and West Bengal
Total procurement excluding procurement from hydro sources and RE sources	Karnataka
Total Procurement 137	Madhya Pradesh, Maharashtra and Uttarakhand

CONSUMPTION FOR RPO COMPUTATION

- *RPO computation approach varies across the States*

- *MoP notification dated 20.10.2023 States as follows;*

  "In exercise of the powers conferred by clauses (n) and (x) of section 14 of the Energy Conservation Act, 2001 (52 of 2001), the Central Government in consultation with the Bureau of Energy Efficiency, hereby specifies the minimum share of consumption of non-fossil sources (renewable energy) by designated consumers as energy or feedstock and different share of consumption for different types of non-fossil sources for different designated consumers in respect of electricity distribution licensee and other designated consumers who are open access consumers or captive users to the extent of consumption of electricity from sources other than distribution licensee as a percentage of their total share of energy consumption indicated in the Table below:…."

- *FOR can build consensus among States on the approach that could be adopted for RPO computation across all States.*

138

RPO TARGETS – IDENTIFICATION OF OBLIGATED ENTITIES

- *SERCs have categories Obligated entities in three type i.e., Distribution Licensees, Open Access Consumers and Captive Power Plants (CPPs).*
- *Some States have created a mechanism for data reporting by obligated entities to State Nodal Agency in timely manner.*
- *However, list of identified Open Access Consumers and CPPs for the respective financial year not published by the SERCs or SNA.*
- *JSERC taking a cue from the MoP Notification dated 20.10.2023 has specified in their RPO regulations that the Jharkhand Renewable Energy Development Agency shall maintain data related to compliance of renewable energy utilization by the designated consumer(s) and submit report to the Jharkhand State Electricity Regulatory Commission and Central Government.*

- *In this regard, FoR can build consensus among States on yearly publication of OA Consumers and CPPs Obligated entities in State Commission or SNA websites.*

or

- *FOR may create a dedicated Centralised Portal for submission of data of Obligated entities by State Nodal Agencies/State Commission.*

139

RPO TARGETS – DATA REPORTING AND COMPLIANCE……1/2

- *Few States such as Bihar, Jammu & Kashmir, and Jharkhand have clear data reporting formats in their Regulations.*
- *States such as Maharashtra, Madhya Pradesh, Andhra Pradesh, Uttarakhand and Punjab have mechanism for timely reporting to the State nodal agency.*
- *In Karnataka, KPTCL publishes quarterly RPO compliance data for five DISCOMs. However, other obligated entities compliance data is not available.*
- *In Madhya Pradesh, Regulations specifies SNA to publish obligated entities data on quarterly basis on their website.*
- *However, there are gaps observed in data reporting. Further, the data accessibility is not easily available or reported by SNA for public accessibility for all the stakeholders.*
- *There is a need for reporting RPO compliance in a timely and transparent way.*

PENALTIES & INCENTIVES…..1/3

- MoP Notification date 20.10.2023 states that,

  "The specified renewable energy consumption targets shall be met either directly or through Certificate in accordance with the Central Electricity Regulatory Commission (Terms and Conditions for Renewable Energy Certificates for Renewable Energy Generation) Regulations, 2022, published in the Gazette of India, Extraordinary, Part III, Section 4, dated the 24th May, 2022:

  Provided that any shortfall in specified renewable energy consumption targets shall be treated as non-compliance and penalty shall be imposed as such rate specified under sub-section (3) of section 26 of the said Act."

- The **Section 26(3) of Energy Conservation Act, 2001 ("EC Act, 2001"),** as amended on 19th December 2022, states that

  "(3) If any person fails to comply with the directions issued under clauses (n) and (x) of section 14, he shall be liable to a penalty which shall not exceed ten lakh rupees for each such failure:

  Provided that he shall also be liable to an additional penalty which shall not exceed twice the price of every metric ton of oil equivalent prescribed under this Act, which is in excess of the prescribed norms."

- **Jharkhand State Commission has aligned penalties mechanism as per EC Act 2001.**

141

RPO NON-COMPLIANCE–PENALTIES & INCENTIVES…..2/3

- *There is significant variation in penalty mechanisms across States.*
- *Penalty/Incentives provisions of some States regarding non-compliance of RPO has been shown below:-*

Sr. No.	Particulars	States
Penalty for Non-Compliance		
1.	Penalty under Section 142 (EA, 2003)	Karnataka.
2.	Regulatory fund	Gujarat, Kerala and Uttar Pradesh.
3.	Both Regulatory Fund and Penalty under Section 142 (EA, 2003)	Chhattisgarh, Haryana, Madhya Pradesh, Odisha, Punjab, Rajasthan, Telangana, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttarakhand and Andhra Pradesh.
4.	▪ Delhi imposes penalty as 10% of weighted average REC price discovered at Power Exchange for the relevant year. ▪ Maharashtra imposes a penalty of Rs. 0.10 per unit for cumulative shortfalls in total RE procurement for all obligated entities, with DISCOM penalties deducted from the ARR.	
Incentives for exceeding RPO Target		
5.	▪ Maharashtra is the only State where Incentive Mechanism is extended to obligated entities for exceeding their RPO targets, provided they had no backlog of under-compliance from previous years. ▪ Incentive is provided @ Rs. 0.10/kWh.	

142

RPO MONITORING – FORMATS

- *In Order to fulfill the mandate of Monitoring of Renewable Purchase Compliance, format has been circulated which if updated timely will enable FOR to fulfill the mandate as stipulated in the FOR (Amendment) Rules, 2022.*

- *Four (4) RPO compliance formats have been created to capture data and for monitoring purposes. Depending on the applicable RPO Regulations, the State Commissions are required to provide the information to the Forum of Regulators.*

❖ **The four RPO Compliance formats are as follows:-**

a) **RPO Compliance Format_SERC Target_DISCOMs**
b) **RPO Compliance Format_SERC Target_OA Consumers & Captive Users**
c) **RPO Compliance Format_MoP Target_DISCOMs**
d) **RPO Compliance Format_MoP Target_OA Consumers & Captive Users**

For timely execution of work, and for better co-ordination on exchange of data it is requested that one nodal person from each Commission may be named.

143

Thank You!

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