

MINUTES OF THE SPECIAL MEETING OF FORUM OF REGULATORS (FOR)

Venue : Upper Ground Floor Conference Hall,
CERC, New Delhi
Date/Day : 8th February 2024 – Thursday
Timings : 11.00 hrs
List of participants: Annexure – I

At the outset, Shri Jishnu Barua, Chairperson, FOR/CERC welcomed all the members to the special meeting of FOR. Thereafter, the agenda items were taken up for discussion.

AGENDA 1: PRELIMINARY REPORT OF FOR WG ON RE POLICY

1. Chief (RA) briefed the Forum about the Working Group constituted under the chairmanship of KERC Chairperson on “RE related policy and regulatory matters” and that the WG has prepared a preliminary report with three recommendations concerning “Implementation aspects of Banking of Energy”, “Green energy tariffs” and “Issues involving RPO and Non-fossil Fuel Consumption Obligation”. It was informed that the recommendations regarding Energy Banking had been endorsed in the 89th FOR meeting, with the suggestion to also look into specific issues raised by UPERC Chairperson. The remaining recommendations are set for discussion in this meeting. Thereafter, the consultants assisting the WG made a presentation on the preliminary report (**Annexure – II**).
2. Regarding Green Energy Tariff, it was highlighted that MPERC, in its recent Tariff Order for FY 23-24 has elaborated the formulation of green tariff for different consumer categories which aligns with the GEOA Rules, 2022. The Forum approved the WG's proposal to determine Green Tariff in line with GEOA Rules 2022 and align the same with the methodology used by MPERC, subject to the condition that the Green Tariff should not be lower than the Average Billing Rate (ABR) of the respective consumer categories. Further, it was also decided that FOR Secretariat may write to MOP suggesting adding a clause in its GEOA Rules, 2022, stipulating that the

Green energy tariff determined as per the principles prescribed in the Rules should not be lower than the ABR of the respective consumer segments. This is required in the interest of discom viability alongside the promotion of green energy.

3. Regarding Renewable Purchase Obligation (RPO) vs Renewable Compliance Obligation (RCO), the Forum discussed the legal issues as to whether the introduction of RCO would take precedence over the RPO targets specified under the EA, 2003 by SERCs. Upon detailed deliberation of the provisions of Section 86(1)(e) of the EA 2003 and provisions of Section 14 of the EC Act 2001, the Forum felt that both RPO related provisions under the EA 2003 and RCO related provisions under the EC Act 2001 could co-exist and that the two should be harmonized.
4. It was also highlighted that under the non-fossil fuel consumption target notification, RE consumption obligations are specified for wind, hydro, DER, and other technologies. However, the potential for harnessing renewable energy for different technologies varies significantly from one State to another. Therefore, stipulating the same trajectory for all States may not be appropriate. Consequently, it becomes imperative to carefully examine the RPO Trajectory for non-RE Rich States and for States with high potential for a specific RE technology.
5. After detailed deliberation, the Forum recommended that the Working Group undertake a study in this matter. It was informed that FOR had already carried out a study on “Assessment of Various Renewable Energy Resources Potential in Different States, Determination of RPO Trajectory and its Impact on Tariff” in 2010. Therefore, the current study can be developed on the previous study and specify the trajectory of RPO specifically for non-RE rich States, and its impact on consumer tariff be analyzed. Thereafter, based on the study report, the Forum may consider making recommendations to the Ministry of Power to consider factoring in the study results when fixing RCO targets for the States.

AGENDA 2: REFERENCES FROM SERCS

a) TO ACCELERATE THE DEVELOPMENT OF HYDROPOWER, PARTICULARLY PUMPED STORAGE FOR GRID STABILITY- REFERENCE FROM HPERC

6. The Forum was apprised of the reference received from HPERC, which referred to the matter of accelerating the development of hydropower, particularly pumped storage for grid stability. Chairperson, HPERC, informed the attendees that though there is a huge potential for hydro power in the country, during the last few years only a few thousand MW has been installed and the remaining are still in the pipeline. In order to facilitate the integration of variable renewable energy sources into the power system and to maintain a stable and balanced grid, this sector can play an important role in meeting resource adequacy concerns.
7. After detailed discussion, the Forum decided to constitute a Working Group to explore measures for encouraging hydropower development and suggest ways and means to accelerate harnessing hydro potential (including pumped storage), in the country. The composition of the Working Group would be as follows:
 - a) Chairperson, Himachal Pradesh ERC- Chairperson of the Working Group
 - b) Chairperson, Punjab SERC- Member
 - c) Chairperson, Arunachal Pradesh SERC- Member
 - d) Chairperson, Sikkim SERC- Member
 - e) Chairperson, Chhattisgarh SERC – Member
 - f) Chairperson, Uttarakhand ERC- Member
 - g) Chairperson, Karnataka ERC- Member
 - h) Chairperson, Maharashtra ERC- Member
 - i) Chairperson Assam ERC- Member

b) UNITARY RATIO QUALIFYING METHOD AS SPECIFIED BY HON'BLE SUPREME COURT IN ITS ORDER DATED 09.10.2023 IN CIVIL APPEAL NO. 8527-8529 OF 2009 IN M/S. DAKSHIN GUJARAT VIJ COMPANY LIMITED VERSUS M/S. GAYATRI SHAKTI PAPER AND BOARD LIMITED AND ANOTHER FOR VERIFYING THE GROUP CAPTIVE STATUS. - REFERENCE FROM KERC

8. The Forum was apprised of the reference received from KERC regarding the Supreme Court judgement on verification of group captive status and the principle of weighted average concerning electricity consumption requirements.
9. Chairperson, KERC informed that as per the Electricity Rules, 2005, the captive user(s) of a captive plant being operated by an Association of Persons shall hold not less than twenty six percent of the ownership of the plant in aggregate, and such captive user(s) shall consume not less than fifty one percent of the electricity generated, determined on an annual basis, in proportion to their shares in ownership of the power plant within a variation not exceeding ten percent. In its order, the Supreme Court has defined the unitary qualifying ratio being the consumption requirement divided by the shareholding requirement, that is, 51% divided by 26% i.e. 1.96% and has indicated that the owner of every 1% shareholding of the CGP should have a minimum consumption of 1.96% of the electricity generated by the CGP, with a variation of +10% being permissible. Therefore, the unitary qualifying ratio has to be within a range of 1.764% to 2.156%. However, the order does not specify the conditionalities in case where shareholding is more than 26 % and captive consumption is more than 51%.
10. The members were also of the view that since the Hon'ble Supreme Court, in its order, has illustrated the formula for consumption up to 51% by the captive users and having a shareholding of 26%, the same principle can be extrapolated where the actual consumption by the captive users is more than 51% and shareholding of captive users is more than 26%."

c) ELECTRICITY (AMENDMENT) RULES 2024 - REFERENCE FROM KERC

13. The Forum was apprised of the Electricity (Amendment) Rules, 2024, notified by the Ministry of Power on 10th January 2024, and the reference to them received from KERC, wherein it was highlighted that as per the Amendments to Rules, the additional surcharge levied on any Open Access Consumer is not to be more than the per unit fixed cost of power purchase of the distribution licensee concerned and is to be linearly reduced and eliminated within four years from the date of grant of such access. Also, the Rules say that an additional surcharge shall not be applicable for Open Access Consumer to the extent that contract demand is being maintained with the distribution licensees. Chairperson KERC emphasized that all these steps may have an impact on the financial health of the Discoms.
14. The members discussed the applicability of additional charges to the new open access consumers who intend to be connected to or get connected to the ISTS/ STU system for drawal of power under open access but are not consumers of the Discoms. It was deliberated that since they are not part of the Discom's network, the applicability of additional surcharges on them may not be appropriate. The members further noted that the surcharge is of the nature of compensation levied on the existing consumer who intends to move away from procurement of power from the Discom. Since the full fixed cost that is incurred by the Discoms towards power procurement is not recovered under the demand charges claimed by the Discoms, and a large part of the same is being recovered as the energy charges, the levy of an additional surcharge on such consumers is justified. Regarding the administrative costs, these are claimed by the Discoms under the cross-subsidy surcharge.
15. After detailed discussions, the members noted the Rules for appropriate action by the respective SERCs. It was suggested that the issues raised and the comments offered by the members may be deliberated in detail by the Working Group on Harmonization of Rules.

d) CEA PROCEDURE FOR VERIFICATION OF GROUP CAPTIVE STATUS – REFERENCE FROM RERC

16. The Forum was apprised of the reference from RERC on the draft procedure issued by CEA for verifying the group captive status of such Generating plants, where CGP and its captive user(s) are located in more than one State. As per the draft procedure, if the captive generating plant (CGP), captive user, or distribution licensee disagrees with the status as determined by CEA, they can appeal to the Central Government within 30 days of communication from the Verifying Authority.
17. During the discussion, the members emphasized that the Central Commission is mandated to adjudicate upon Inter-State disputes. Thus, any dispute regarding the verification of the captive status of a CGP, wherein the CGP and Consumer(s) are situated in more than one State, would be an Inter-State dispute, which, as per settled procedure, falls under the jurisdiction of the Central Commission.
18. After discussion, it was decided that the Electricity Rules pertaining to captive generation including this aspect of verification of group captive status may be reviewed further by the Working Group on Harmonization of Rules, for suitable recommendation to the Ministry of Power.

e) MODEL REGULATIONS WITH REFERENCE TO CERC CONNECTIVITY AND GENERAL NETWORK ACCESS TO THE INTER-STATE TRANSMISSION SYSTEM) REGULATIONS 2022 – REFERENCE FROM KERC.

19. The Forum was briefed about the reference received from KERC regarding the framing of Model Connectivity and General Network Access for intra-state transactions in order to give effect to the CERC Regulations and also regulate connectivity to the STU, sharing of GNA, and other matters.

20. After discussion, the members decided that the same may be referred to the FOR Working Group on RE Policy for necessary action and framing of the Model Regulations.

AGENDA 3: REFERENCES FROM MOP

a) BIOMASS CO-FIRING IN TARIFF REGULATIONS

21. The Forum was apprised of the reference received from the Ministry of Power (MoP) on biomass utilization through co- firing in coal- based thermal power plants, wherein they had requested that the State Commissions incorporate provisions for biomass utilization in their Tariff Regulations in line with CERC Regulations. The Forum was also informed that a compilation prepared by the FOR Sectt indicated that some SERCs have already made provisions on Biomass Co-firing in their respective regulations. Hence, the remaining SERCs were requested to consider incorporating regulatory provisions on biomass co-firing.
22. The members of the Forum noted the same for appropriate action at their end.

b) ROP OF MINISTER MEETING – ACTION POINTS FOR FORUM OF REGULATORS

23. The Forum was apprised of the status of action points for FOR based on the ROP of the previous Minister meeting held on 3rd October 2023. It was informed that the FOR Sectt is in the process of finalising the consultants/agencies to assist in taking up the additional functions, and MOP has been requested to allocate funds for this purpose. With respect to issues on amendment to FOR Model Regulations on GEOA and Model Tariff Regulations, these are being taken by the two FOR Working Groups i.e, the WG on RE policy and on Harmonisation of Rules, respectively.
24. The Forum noted the same.

AGENDA 4: REGULATORY GOVERNANCE IN THE INDIAN POWER SECTOR – STUDY OF IIT KANPUR FOR NITI AAYOG – REFERENCE FROM IIT KANPUR

25. The Forum was informed that IIT Kanpur is conducting a study for NITI Aayog on Regulatory Governance and has requested to make a presentation before the Forum. Thereafter, Dr Anoop Singh, Professor, IIT Kanpur, presented the draft study report. (**Annexure - III**)
26. During the presentation, Dr Singh shared insights from the study, which was aimed at evaluating the broader regulatory governance structure within the sector, identifying factors hindering its effectiveness, and proposing measures to improve its strength. He covered topics on financial and functional autonomy, organizational capacity, accountability, and role clarity within the regulatory bodies. He highlighted that the process of getting approvals from the Government hinders the capacity of the regulators to take independent decisions. Furthermore, he underscored the capacity challenges faced by the regulatory bodies due to insufficient human resources. Lack of sufficient human resources significantly hinders the ability of the ERCs to keep up with the rapidly evolving power sector. He emphasized that the budget and human resource seem to be limited with growing demand of power market and are also being influenced by the dynamic political scenarios. He also suggested that there is a continuous need for capacity building and the improvement of the skills of the officers engaged in regulatory functions through focused certification programs in a periodic manner. He further highlighted that the annual reports of the SERCs should be published in the local language as well for better reach and ease of understanding.
27. The Forum noted the suggestions made by IIT- Kanpur.

AGENDA 5: ANY OTHER ITEM- BUDGET OF FOR WORKING GROUP

28. The Forum was apprised that some SERCs have informed the FOR sectt that the current ceiling of the reimbursement amount to the host ERC at Rs. 5 Lakh for conducting the Working Group meetings is insufficient as most of the meetings are held away from headquarters, and requested an enhancement in the limit.

29. After detailed deliberation, the Forum decided that the current ceiling of Rs. 5 Lakhs may be increased to Rs. 7.5 lakhs. The same shall be implemented prospectively, but including the Working Group meetings held in the recent past for which the final settlement of the expenses has not been completed. The Forum also recommended that the WG meetings be conducted alternately in Delhi and outside Delhi.

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

ANNEXURE – I

**LIST OF PARTICIPANTS OF THE SPECIAL MEETING OF THE FORUM OF
REGULATORS (“FOR”) HELD ON THURSDAY, 08TH FEBRUARY, 2024.
AT NEW DELHI (INDIA)**

S. No.	NAME	ERC
01.	Shri Jishnu Barua Chairperson	CERC/FOR – in Chair.
02.	Shri R.K. Joshi Chairperson	APSERC
03.	Shri Kumar Sanjay Krishna Chairperson	AERC
04.	Shri Hemant Verma Chairperson	CSERC
05.	Shri D.K. Sharma Chairperson	HPERC
06.	Shri P. Ravi Kumar Chairperson	KERC
07.	Shri S.P.S. Parihar Chairperson	MPERC
08.	Shri Sanjay Kumar Chairperson	MERC
09.	Shri P.W. Ingty Chairperson	MSERC
10.	Shri Viswajeet Khanna Chairperson	PSERC
11.	Shri K.B. Kunwar Chairperson	SSERC
12.	Shri M. Chandrasekar Chairperson	TNERC
13.	Shri T. Sriranga Rao Chairperson	TSERC
14.	Shri D. Radhakrishna Chairperson	TERC
15.	Shri Arvind Kumar Chairperson	UPERC
16.	Shri Gajendra Mohapatra Chairperson Incharge	OERC
17.	Shri Thakur Rama Singh Member	APERC
18.	Shri Arun Kumar Sinha Member	BERC

19.	Shri Mehul M. Gandhi Member	GERC
20.	Shri Atul Kumar Member	JSERC
21.	Shri A.J. Wilson Member	KSERC
22.	Shri Madan Lal Prasad Member	UERC
23.	Shri Pulak Kumar Tewari Member	WBERC
24.	Shri Harpreet Singh Pruthi Secretary	CERC/FOR
25.	Dr. Sushanta Kumar Chatterjee Chief (Regulatory Affairs)	CERC
SPECIAL INVITEES		
ERC		
26.	Shri Pravas Kumar Singh Member	CERC
27.	Shri Awdhesh Kumar Yadav Chief (Engg.)	CERC
28.	Shri Rajeev Pushkarna Chief (Fin.)	CERC
FOR SECRETARIAT		
29.	Ms. Rashmi Somasekharan Nair Dy. Chief (RA)	CERC
30.	Ms. Sukanya Mandal Assistant Secretary	FOR
31.	Shri Ravindra Kadam Sr. Adv. (RE)	CERC
32.	Shri Sauarabh P.R.O. (RA)	CERC
33.	Shri Sushil Kumar Arora Administrative Officer	CERC
34.	Ms. Nausheen Research Associate	CERC
35.	Shri Aman Raj Research Associate	CERC
36.	Ms. Medhavi Sarraf Research Associate	CERC

37.	Shri Davinder Kumar Technical Officer	IT Cell
38.	Shri Anirudh Panwar Site Engr.	IT Cell
OTHERS / GUESTS		
39.	Shri Ajit Pandit	Idam Infra-USAID-SAREP
40.	Dr. Anoop Singh	IIT-K

FOR RE Working Group

8th February 2024

Annexure-II



Agenda

- Context
- Highlights of WG Meetings
- Key Issues & Recommendations
 - ❖ Implementation Aspects of Banking of Energy
 - ❖ Tariff for Green Energy to be supplied by DISCOM
 - ❖ Renewable Purchase Obligation Vs Minimum RE consumption target

Context

The FOR, in its 86th meeting held on 26th June 2023 decided to constitute a Working Group for conducting a detailed examination of all RE related policy and regulatory issues.

Objective of WG: To identify and mitigate emerging issues on policy and regulatory fronts.

- 1 • Examine and review the policies and regulations on RE at the Center and in the States in light of the target set for RE capacity addition in the country.
- 2 • Identify and suggest measures for harmonization of RE policies and regulations.
- 3 • Assess the impact of increasing share of RE in the overall energy mix and suggest suitable policy & regulatory measures.
- 4 • Examine the issues involved in implementation of the distributed energy sources (group/ virtual net metering etc.) and suggest suitable measures.
- 5 • Examine RPO targets set by the Government and SERCs for harmonization;
- 6 • Assess and suggest measures for ensuring RPO compliance targets by the obligated entities.
- 7 • Any other matter related and incidental to the above.

Constitution of FOR Working Group

Chairperson, KERC - Chairperson of the Working Group

Chairperson, RERC - Member

Chairperson, HPERC - Member

Chairperson, TNERC – Member

Chairperson, MERC - Member

Chairperson, OERC – Member

Chairperson, APERC - Member

Chairperson, MSERC - Member

Member (Finance), CERC - Member

Chief (Regulatory Affairs), CERC – Member
Convenor

Highlights of WG Meetings

- As on January 15, 2024, the WG held three meetings to understand perspective and issues involved in RE policy and regulatory framework.

First Working Group Meeting	Second Working Group Meeting	Third Working Group Meeting
<ul style="list-style-type: none"> The WG held its first meeting on 15 September 2023. In the first meeting, Ministry of New and Renewable Energy (MNRE) presented the current policy and regulatory initiatives. Following key issues in RE related policy and regulatory framework identified: <ul style="list-style-type: none"> ❖ Uniform GEOA charges ❖ Avoid duplication of OA charges ❖ ISTS connectivity related issues ❖ Applicability of transmission charges in case of intra-state consumer opting ISTS GNA from multiple generators ❖ Promotion of rooftop solar with revised policy and regulatory framework ❖ Promote Energy Storage 	<ul style="list-style-type: none"> The WG held its second meeting on 27 October 2023 at New Delhi. The WG deliberated the regulatory provisions on key parameters across select states on the following topics vis-à-vis provisions under various Rules notified by MOP viz. Net Metering, Banking provisions under GEOA, NFFO and RPO framework. The WG decided to have further detailed discussion on the specific implementation aspects of these thematic issues such as: <ul style="list-style-type: none"> ❖ Net metering framework incl. VNM/GNM concepts ❖ Implementation aspects of Banking in case of Intra/Inter-State Green Energy Open Access ❖ Green Tariff mechanism ❖ Implication of non-fossil fuel obligations on RPO framework 	<ul style="list-style-type: none"> The WG held its third meeting on 4 January and 5 January 2024 at Mangalore, Karnataka. The third meeting of the WG included a detailed analysis of: <ul style="list-style-type: none"> ❖ Concept of banking of energy across the states of Maharashtra, Gujarat and Karnataka, ❖ Green Tariff Framework, and ❖ Minimum RE consumption targets Vs RPO targets. The WG decided to present key issues and recommendations on following two thematic issues: <ul style="list-style-type: none"> ❖ Implementation aspects of Banking of Energy ❖ Tariff for Green Energy to be supplied by DISCOM

Key Issues & Recommendations

- Implementation Aspects of Banking of Energy

Implementation Aspects of Banking of Energy

- During 2nd working group meeting, WG members deliberated on GEOA rules issued by MoP and regulations across various States.
- Banking of electricity was noted as an important consideration for operationalizing GEOA.
- Further, the provisions of banking and associated conditions vary across states. Hence, action point on “Implementation aspects of Banking in case of Intra/Inter-State Green Energy Open Access” was identified for further deliberation.
- Upon analyzing the regulations for GEOA notified by the states, it was noticed that:
 - ❖ Banking provisions were restricted to TOD slots with monthly banking cycle.
 - ❖ The minimum quantum of banked energy is restricted to 30%.
- This section covers issues identified and possible recommendations for further deliberations:
 - Issue-1: Applicable Banking Charges
 - Issue-2: Levy of Wheeling and Transmission Charges only once
 - Issue-3: Permitted Quantum or Limit on Banked Energy
 - Issue-4: Banking Cycle
 - Issue-5: Treatment of Unutilized Surplus Banked Energy / Entitlement to get REC
 - Issue-6: Inter-state Banking

Issue I: Applicable Banking Charges (I/2)

Whether the banking charges should be adjusted in kind or in Rs/kWh?

- **Analysis**

- Regarding adjusting banked energy in kind or in Rs/kWh, the WG deliberated that adjusting the banked energy in kind would be the simpler alternative to implement as it has already been practiced in the states for many years.
- Whereas, adjusting the banking charges in Rs/kWh can be calculated by linking energy banking with weighted average market clearing price in Power Exchanges, which is quite complex.

Recommendations – Banking charges should be adjusted in kind, which has been in practice in many states.

Whether the banking charges adjusting in kind as 8% of the energy banked should be lowered?

- **Analysis**

- The rate of banking charges as 8% in kind was deliberated at length by FOR WG on GEOA and subsequently endorsed by FOR in its 82nd meeting dated September 16, 2022, while approving the GEOA regulations.

Recommendations – Energy banked during the off-peak period shall be permitted to be withdrawn during the off peak period by paying the banking charges in kind as 8% of wheeled energy.

Issue I: Applicable Banking Charges (2/2)

Whether the additional charges be levied on the drawl of energy in peak period which was banked during off peak period?

- **Analysis**

- The power procurement costs for discoms during the peak period varies significantly from one state to another and are higher than the costs of power procurement during off peak period.
- Even off-peak to off-peak period banking has an element of cross subsidization, the impact of which is borne by the consumers.
- For instance, the average off-peak price in DAM during the year 2023 (up to November) was Rs. 5.11 per unit as against the average solar tariff around Rs. 3.00 per unit. Considering the banking charge of 8%, the discom can recover the cost only Rs. 3.24 per unit, which is much less than the average off peak price of Rs. 5.11 per unit.
- But the same dispensation if allowed for off-peak to peak period banking, the financial impact would be very severe on the discom, considering the peak price of Rs 7.57 per unit in DAM during year 2023 (up to November), as against the average solar price of Rs 3.00 per unit.
- Allowing levy of additional banking charges for off peak energy drawl during peak period, will discourage the development of energy storage systems in the country as the consumers would use the grid as a storage system.
- Further, states like HP, J&K and North Eastern States with hydro generation linked to snow-fed rivers and winter seasonality considerations, would find it difficult to operationalize banking provisions including the adjustments from off peak to peak period.
- State-specific parameters should be considered while allowing banking and associated conditions.

Recommendations – Appropriate Commission may specify the additional banking charges for the withdrawal of energy in peak period which was banked during off peak period taking into account state specific considerations.

Issue 2: Levy of Wheeling and Transmission Charges Only Once

- **Analysis**

- Based on analysis of FOR Model Regulations as well as the regulations notified by SERCs, the WG noted that the banking of energy is undertaken on the wheeled energy which is received at the consumer end after the levy of wheeling charges/losses and transmission charges/losses (if applicable).

- **Recommendations:**

- Wheeling charges and transmission charges shall be levied only once in case of adjustment of credit of banked energy.
- In order to avoid ambiguity and provide necessary clarifications to the stakeholders, following explanation can be incorporated by the SERCs in their GEOA Regulations.

“If Wheeling Charges and Losses have been levied on the full quantum to determine wheeled energy, then no further wheeling charges and losses shall be levied on banked energy during drawl.”

Issue 3: Permitted Quantum or Limit on Banked Energy

- **Analysis**

- GEOA Rules, 2022 stipulate that the permitted quantum of banked energy shall be “at least thirty percent of the total monthly consumption of electricity from the distribution licensee by the consumers”.
- The permitted quantum of ‘at least 30 percent’ gives an impression that a consumer intending to bank less than 30 per cent of its monthly consumption shall not be permitted the banking facility, which does not seem to be the intent.
- At the same time, allowing a consumer to bank 100 percent of its monthly consumption may adversely affect the finances of the DISCOM.
- The promotional measures of banking should be designed in such a way as to balance the interest of the consumers as well as the discoms.
- Hence, it is recommended that banking should be limited up to a maximum of 30% of the total monthly consumption of a consumer.

- **Recommendations:**

- In order to balance the interest of the consumers and the discoms and also with a view to ensuring that the banking of energy does not discourage investment in energy storage system, MoP should be advised to amend Clause 8(2) of the GEOA Rules as under:

“8(2) The ~~permitted quantum of banked energy by the Green Energy Open Access consumers shall be~~ permitted to bank up to a maximum of ~~at least thirty percent of the total monthly consumption of electricity from the~~ green energy source in a banking cycle ~~distribution licensee by the consumers.~~”

Issue 4: Banking Cycle

- **Analysis**

- The WG debated on the appropriate duration of the banking cycle for the GEOA consumer.
- The provisions under GEOA Rules 8(1) have stipulated that period of banking cycle to be ‘at least’ monthly basis.
- Many states have defined a monthly banking cycle.
- Further, some of the RE technologies such as wind have seasonal generation (for four months) and might need banking cycle period of more than one month (quarterly, six monthly or annual).

- **Recommendations:**

- Appropriate Commission may specify the banking cycle for different RE sources considering their state specific scenarios.
- The Clause (d) of Regulation 10 of the FOR Model GEOA Regulations may be suitably modified to incorporate the concept of banking cycle as prescribed in the GEOA Rules with flexibility to states to decide the periodicity of billing cycle as per the state specific conditions to include the following :

“Banking shall be permitted at least on a monthly basis[] ([*] SERCs may specify different banking cycle for different RE sources), on payment of charges to compensate additional costs, if any, to the distribution licensee by the Banking and the Appropriate Commission shall fix the applicable charges.”*

Issue 5: Treatment of Unutilized Surplus Banked Energy

- **Analysis**

- GEOA Rules (First Amendment) dt 27-Jan-2023 specified that there will not be any compensation for un-utilized banked energy at the end of banking cycle, however, RE generating stations shall receive RE certificates to the extent of lapsed banked energy.
- However, a subsequent letter from MOP dated 27-Mar-2023 has advocated compensation for un-utilized banked energy at the end of banking cycle at the rate of 80% of tariff rate discovered through competitive bidding.
- The WG opined that issuance of RECs for un-utilized banked energy for RE generator might not be fair, as the banked energy credits are adjusted to the account of the consumers.
- The WG observed that the unutilized banked energy should be compensated to the consumers and the benefit of RPO credit should also be provided to the discom for providing banking facility.

- **Recommendations:**

- In order to pass on the benefit of unutilized banked energy to consumers and the benefit of RPO to Discom, the WG recommends that clause (d) of Regulation 10 of the FOR Model Regulations on GEOA and second proviso to Clause 3 of the GEOA Rules (First Amendment) be modified as under :

“Provided further that the unutilized banked energy shall be considered as lapsed at the end of each banking cycle and GEOA consumer shall be compensated at the rate of 75% of the last discovered SECI tender rate and the benefit of RPO shall be given to the distribution licensee for the corresponding unutilized banked energy.”

Issue 6: Inter State Banking

- **Analysis**

- The WG deliberated on the issue of inter-state banking.
- Inter-state transactions are based on the schedules (injection/ drawal schedule) and not on actual generation / drawal, and the difference between the schedule and actual is settled through DSM.
- Energy / deviation accounting framework for inter-state/regional energy accounting on weekly basis necessitate aggregations of schedules at state periphery irrespective of the source of energy (green or otherwise) and settlement of such transactions on weekly basis (Monday to Sunday), thus, segregation of banked energy accounts will not be possible in that case.

Recommendations –

- Banking of energy for inter-state wheeling transactions may not be feasible as it is not aligned with regional framework for energy and deviation accounting, and commercial settlement of inter-state transactions which are based on 15-minute time-block with weekly settlement cycles.
- Further, several other promotional measures to facilitate inter-state transactions for RE have been enabled such as, the tolerance band for deviation by solar and wind generators; special dispensation in the definition of error linked to Available Capacity (instead of Scheduled Generation), waiver of inter-state transmission charges and losses, etc.
- As such inter-state banking as another promotional measure may not be required.

Key Issues & Recommendations

- Tariff for Green Energy to be supplied by DISCOM

Context: Green Tariff

- Green tariff is offered to the consumers by many states such as Maharashtra, Gujarat, Karnataka, Andhra Pradesh, Tamil Nadu, and Madhya Pradesh, Punjab, and Haryana.
- As per MoP Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022 dated 6th June 2022,

“4. Renewable Purchase Obligation:

.....

(C) By requisition from distribution licensee—

(a) Any entity may elect to purchase green energy either up to a certain percentage of the consumption or its entire consumption and they may place a requisition for this with their distribution licensee, which shall procure such quantity of green energy and supply it and the consumer shall have the flexibility to give separate requisition for solar and non-solar;

(b) The consumer may purchase on a voluntary basis, more renewable energy, than he is obligated to do and for ease of implementation, this may be in steps of Twenty-five per cent and going up to Hundred per cent;

(c) The tariff for the green energy shall be determined separately by the Appropriate Commission, which shall comprise of the average pooled power purchase cost of the renewable energy, cross-subsidy charges if any, and service charges covering the prudent cost of the distribution licensee for providing the green energy;

(d) Any requisition for green energy from a distribution licensee shall be for a minimum period of one year;

.....”

Green Tariff Approved in Various States for FY 2023-24

State	Green Tariff for FY 2023-24
Maharashtra (MSEDCL)	INR 0.66/ Unit
Karnataka (BESCOM)	INR 0.50/ Unit
Andhra Pradesh	INR 0.75/ Unit
Tamil Nadu	10% extra charge over and above that applicable tariff for HT
Madhya Pradesh	A) For consumers availing green tariff to reduce carbon footprints: INR 0.97/ Unit
	B) Obligated and non-obligated entities as per MPERC (Co-generation and generation of electricity from Renewable sources of energy) Regulations, 2021 <ul style="list-style-type: none"> • Other RE: INR 0.96/ Unit • Wind: INR 0.25/ Unit • Hydro: INR 3.10/ Unit

Issue: Methodology for Green Tariff Computation (I/2)

- **Analysis**

- Green tariff is applicable as an incremental component over and above the applicable tariff to the respective consumer category.
- Such premium or incremental component is determined as proportion (say, 50% to 75%) of the difference in Tariff rate for RE power procurement and variable cost of non-RE (thermal) power procurement by the utility for the concerned financial year.
- DISCOMs get benefit of RPO by procuring green power as well as green tariff from consumers opting for green energy.
- As per MoP GEOA Rules, Green Tariff shall be determined based on APPC of RE, Cross Subsidy and other service charges and it shall be determined by the appropriate SERCs.
- In Maharashtra, green tariff determined is 50% of difference between RE & Non-RE (only variable) power purchase cost (PPC).
- In Karnataka, green tariff was determined based on difference in PPC of Conventional and Non-conventional sources as INR 1.00/ Unit in 2010 and reduced it to INR 0.50/ Unit in 2013 due to various comments received from stakeholders. From 2013 to present, green tariff of INR 0.50/ Unit is applicable for BESCOM.
- In [Madhya Pradesh](#), green tariff is determined with 2 approaches.
 1. 75% of difference between RE and non-RE power purchase cost for consumers availing green tariff only for reducing carbon footprints and certification.
 2. Incremental Green tariff for different RE sources and tariff categories

Issue: Methodology for Green Tariff Computation (2/2)

- **WG deliberations:**

- DISCOMs get the benefit of RPO by procuring green power for consumers opting for green energy.
- Procurement of RE power higher than RPO target (up to 100% green power) to meet the requirements of specific consumers availing green energy, would have cost implications which other consumers (not availing green tariff) will have to bear.
- The incremental/premium approach ensures the cost recovery as per retail tariff design trajectory and the option for willing consumers to avail green tariff (up to 100% RE power) at incremental cost.
- Availability of 24x7 green power is also a constraint.
- The second approach of MPERC is in lines of the GEOA Rules.
- But Green Tariff computed using GEOA Rules might result in green tariff being lower than ACoS in case of some states leading to revenue loss and tariff hike for other consumers.
- The WG deliberated on introducing the formulation prescribed by GEOA Rules to the select subsidized consumer categories (say, domestic, public service connections) to begin with as HT/large consumers also have option to avail GEOA instead of Green Tariff.
- Interpretation of the component under Clause 4 (C) (c) i.e., ‘service charge covering prudent cost of distribution licensee for providing green energy’ as per GEOA rules would influence the determination of Green Energy Tariff (GET)/Green Energy Charge.

- **Recommendations:** WG proposed following changes in GEOA rules as below:

1. For determination of Green Tariff, follow methodology and formulation adopted by MPERC for various components subject to the condition that Green Tariff so determined should not be lower than ABR (Average Billing Rate) for the respective consumer categories.
2. Further, a proviso should be added that green power for consumers availing green tariff shall be “subject to availability of RE.”

Key Issues & Recommendations

- Renewable Purchase Obligation & RE consumption obligation

Comparison of RPO and Minimum share of Non-fossil fuel Consumption Target (I/2)

Sr. No.	Particular	RPO & ESO Trajectory till 2029-30	Minimum Share of consumption from Non-Fossil Fuel (RE) Sources
1.	Notification Date	MoP Notification on 22 July 2022 & Corrigendum on 19 September 2022	MoP Notification on 20 October 2023
2.	Title	Renewable Purchase Obligation (RPO) and Energy Storage Obligation trajectory till 2029-30	Minimum Share of Consumption of Non-fossil Fuel Sources (RE) by designated consumers as energy or feedstock
3.	Effective Period	FY 2022-23 to FY 2029-30	FY 2024-25 to FY 2029-30
4.	Issuance under	<p><u>Electricity Act, 2003</u></p> <p>Section 86. (Functions of State Commission): — (1) The State Commission shall discharge the following functions, namely: -</p> <p>(e) promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee;</p>	<p><u>Energy Conservation Act, 2001</u></p> <p>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.....</p> <p><i>(Section 14 of EC Act: Power of Central Government to enforce efficient use of energy and its conservation)</i></p>
5.	Nodal Agency	POSOCO	Bureau of Energy Efficiency (BEE)
6.	Obligated Entities	<ul style="list-style-type: none"> • Distribution Licensees • Open Access Consumers • Captive Users 	<ul style="list-style-type: none"> • Designated Consumers and other Designated Consumers who are captive or open access consumers.

Comparison of RPO and Minimum share of Non-fossil fuel Consumption Target (2/2)

Sr. No.	Particular	RPO & ESO Trajectory till 2029-30	Minimum Share of consumption from Non-Fossil Fuel (RE) Sources
7.	RPO Targets categories	<ul style="list-style-type: none"> RPO-Wind HPO RPO-Other ESO 	<ul style="list-style-type: none"> Wind RE Hydro RE Distributed RE Other RE
8.	Role of SERCs	<ul style="list-style-type: none"> Under EA 2003, all the functions are given of framing the regulations to SERCs 	<p>Under EC (Amendment) act, 2022, SERCs shall make regulations for discharging the functions given in the EC act.</p> <p><i>(Section 27(A) on Power of State Commission to make regulations newly inserted)</i></p>
9.	Enforcement, monitoring & reporting	<ul style="list-style-type: none"> POSOCO shall maintain the data related to compliance of RPO. SERCs should come up with RPO targets in every control period and SLDCs/ SDAs operates as nodal agency to monitor RPO compliance of obligated entities. 	<ul style="list-style-type: none"> BEE shall maintain data related to compliance of renewable energy utilization by the designated consumer(s) and submit report to the Central Government. <i>(Clause 7 of MoP Notification)</i> Central Govt. in consultation with BEE directs every designated consumer to comply with energy consumption norms and standards; <i>(Section 14 of EC Act)</i> State govt. designates any agency as designated agency to coordinate, regulate & enforce provisions of EC Act within the State. <i>(Section 15 (d) of EC Act 2001)</i>
10.	Penalty	As decided by SERCs	<p><u>Penalty</u></p> <p>Shortfall in specified RE targets leads to non-compliance and incurs penalties as per section 26(3) of the EC Act Amendment, 2022</p> <ul style="list-style-type: none"> Max of INR 10 lakhs for each failure. Additional penalty which shall not exceed twice the price of every MToE prescribed under this Act, which is in excess of the prescribed norms.

Issue 1: Applicable Act/ legal status

Analysis:

- As per MoP Order dated 22 June 2022, RPO targets from FY 2022-23 to FY 2029-30 are defined in pursuance of Electricity Act 2003.
- As per MoP notification dated 20 October 2023, Minimum RE/Non-fossil fuel consumption target are notified in pursuance of EC Act 2001 from FY 2024-25 to FY 2029-30.

This notification shall come into force on the 1st day of April, 2024 and till such time, the RPO trajectory specified in paragraphs 5 to 14 vide the Ministry of Power Order No. 9/13/2021-RCM, dated 22nd July, 2022 read with Corrigendum, dated the 19th September, 2022, shall remain in force

Key deliberations:

- Which Act would prevail (EC 2001 or EA 2003) and whether introduction of RCO under subsequent central act (I.e, EC Act 2001) would replace/override the provisions of RPO target setting and powers of SERC stipulated under EA 2003.
- Is there a need to issue separate regulations to notify non-fossil fuel targets to DCs or notification issued by MoP suffice (like targets given to DCs under Perform, Achieve & Trade Scheme)?

Recommendations –

- Upon detailed deliberations and careful investigation of the provisions of the S86(1)(e) of EA 2003 and provisions of S14 of EC Act 2001, the WG inferred that both RPO target provisions under EA 2003 and RCO provisions under EC Act 2001 can co-exist.
- State can fix RPO targets duly considering RCO trajectory notified by MoP under EC2001 for designated consumers including distribution licensees.

Issue 2: Type of technologies covered under RPO Vs RCO targets

Analysis

- Under Non-fossil fuel consumption target notification, RE consumption obligation has been specified for wind, hydro, DER and other technologies.
- However, potential for harnessing renewable energy for different technologies varies significantly from one state to another.

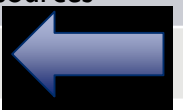
Recommendations –

- States (SERCs) can be allowed to set their state specific RE technology wise RPO targets while duly factoring the RCO targets specified by MOP for designated consumers, wherever applicable, so that the duplication or duality of target setting can be avoided.

Comparison of RPO and Minimum Non-fossil Fuel Consumption Targets

	RPO & ESO Trajectory till 2029-30					Minimum Share of consumption from Non-Fossil Fuel (RE) Sources				
Year	Wind RPO	HPO	Other RPO	Total RPO	ESO	Wind RE	Hydro RE	Distributed RE*	Other RE	Total RE
2022-23	0.81%	0.35%	23.44%	24.61%	-	-	-	-	-	-
2023-24	1.60%	0.66%	24.81%	27.08%	1.0%	-	-	-	-	-
2024-25	2.46%	1.08%	26.37%	29.91%	1.5%	0.67%	0.38%	1.50%	27.35%	29.91%
2025-26	3.36%	1.48%	28.17%	33.01%	2.0%	1.45%	1.22%	2.10%	28.24%	33.01%
2026-27	4.29%	1.80%	29.86%	35.95%	2.5%	1.97%	1.34%	2.70%	29.94%	35.95%
2027-28	5.23%	2.15%	31.43%	38.81%	3.0%	2.45%	1.42%	3.30%	31.64%	38.81%
2028-29	6.16%	2.51%	32.69%	41.36%	3.5%	2.95%	1.42%	3.90%	33.10%	41.36%
2029-30	6.94%	2.82%	33.57%	43.33%	4.0%	3.48%	1.33%	4.50%	34.02%	43.33%

Particular	RPO & ESO Trajectory till 2029-30	Minimum RE Consumption for Designated Consumers
Total Target	Total RPO target is inline with Total RE consumption target	
Wind Target	WPPs commissioned after 31 March 2022 and Wind Energy consumed over & above 7% from WPPs commissioned till 31 March 2022	WPPs commissioned after March 31, 2024
Hydro	HPPs (including PSPs and SHPs) commissioned after 8 March 2019	HPPs (including PSP & SHP) commissioned after March 31, 2024
Distributed RE	-	Distributed RE sourced from projects less than 10 MW. *For hilly and North-Eastern States/Union Territories, DER target shall be 50% of the given targets.
Other	any RE project not mentioned in Wind RPO & HPO sources	any RE project not specified in Wind RE, Hydro RE & DRE component sources



Issue 3: Compliance Monitoring & Enforcement framework

Analysis

- Under RPO, DISCOMs, OA Consumers and Captive consumers are the obligated entities.
- Whereas under minimum RE consumption targets, different designated consumers in respect of electricity distribution licensee and other designated consumers who are open access consumers or captive users are the obligated entities.
- As per MoP Notification dated 20 October 2023, Minimum RE Consumption target are applicable for designated consumers and other designated consumers who are Open Access and Captive Consumers.

Recommendations –

- Provisions of the compliance monitoring, reporting and enforcement would follow from respective Acts.
- There would not be any conflict in its implementation if the cogent reading and congruent interpretation of the provisions of both Acts is undertaken with the clear understanding that intent/purpose of both Acts, being different, its monitoring, reporting and enforcement will also have to be governed as per respective provisions under concerned Acts.

Sample illustration

RPO targets for MSEDCL as per MERC RPO regulations, 2019 for FY 2024-25 Vs Minimum RE consumption targets for FY 2024-25

As per MERC RPO Regulations 2019	MSEDCL	As per minimum Non-fossil Fuel consumption target notification/ RE Consumption Obligation (RCO)	MSEDCL	As per minimum Non-fossil Fuel consumption target notification/ RE Consumption Obligation (RCO)	MSEDCL
Power Purchase Quantum (MU)	1,48,137	Energy available for sale	1,27,913	Energy required for self consumption and T&D loss of DISCOM	20,224
RPO target:Total (%)	25.00%	RCO:Total (%)	29.91%	RCO:Total (%)	29.91%
RPO target: Solar (%)	13.50%	RCO: wind (%)	0.67%	RCO: wind (%)	0.67%
RPO target: Non solar(%)	11.50%	RCO: hydro (%)	0.38%	RCO: hydro (%)	0.38%
		RCO: DER (%)	1.50%	RCO: DER (%)	1.50%
		RCO: Other (%)	27.35%	RCO: Other (%)	27.35%
RPO target:Total (MU)	37,034	RCO:Total (MU)	38,258.78	RCO:Total (MU)	6,049.00
RPO target: Solar (MU)	19,998	RCO: wind (MU)	857.02	RCO: wind (MU)	135.50
RPO target: non-solar (MU)	17,036	RCO: hydro (MU)	486.07	RCO: hydro (MU)	76.85
		RCO: DER (MU)	1,918.70	RCO: DER (MU)	303.36
		RCO: Other (MU)	34,984.21	RCO: Other (MU)	5,531.26

- If RCO are made applicable on consumption by Obligated Entity (or sale of electricity within area of obligated entities), then there won't be significant difference in absolute quantum of RE purchase, as higher RCO targets will offset T&D loss factor.
- If RCO is applicable on self-consumption and T&D loss of DISCOMs, RE purchase of DISCOMs will be much lower.



-Thank you

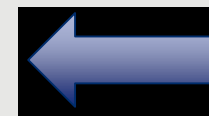
Madhya Pradesh : Green Tariff Determination Method (I/2)

MPERC has separately determined the Green Energy Charges/Tariff and Modalities for two types of Green Energy transactions as follows:

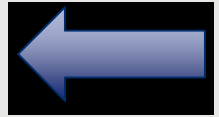
- a) Green tariff for consumers availing Green Energy only for the purpose of reducing their carbon footprint and seeking Certification: 75% of the difference in weighted average rate of RE power and weighted average rate of Energy charge (Variable Charges) of Non-RE sources

Table 93 : Green Energy Charges (for the consumers who wish to procure RE Power for the purpose of reducing their carbon footprint and seeking Certification to this effect) approved by the Commission for FY 2023-24

RE Power Procurement for the Period FY 2023-24			Non-RE Power Procurement (Only Variable) for the Period FY 2023-24			Difference between RE & Non-RE Power	Approved Green Energy Charges
MU	Rs. Crore	Rs/Unit	MU	Rs. Crore	Rs/Unit	Rs/Unit	Rs/Unit
A	B	C	D	E	F	$G = (C - F)$	$H = G * 75\%$
25,096.85	8,352.17	3.33	64,851.76	13,238.06	2.04	1.29	0.97



Madhya Pradesh : Green Tariff Determination Method (2/2)



b) Green tariff for consumers availing Green Energy from Distribution Licensee as per MPERC (Co-generation and generation of electricity from Renewable sources of energy) Regulations, 2021 and amendments thereof.

Table 95 : Computation of Incremental Green Energy Charges for consumers for FY 2023-24

Category of consumers	Effective Cost of Pooled Power Purchase Cost of RE (Rs/kWh)			ABR (Rs/kWh)	Cross Subsidy (Rs/kWh)	Services Charges (Rs/kWh)		Green Energy Tariff Applicable (Rs/kWh)			Incremental Green Energy Charges (Rs/kWh)		
	Others	Wind	Hydro			Fixed Cost of Power Purchase including Transmission Charges	Other ARR Components	Other	Wind	Hydro	Other	Wind	Hydro
A	B	C	D	E	F	G	H	I=B+F+G+H	J=C+F+G+H	K=D+F+G+H	L=I-E	M=J-E	N=K-E
LV-2: Non Domestic	4.86	4.15	7.00	9.45	2.66	1.64	1.25	10.41	9.70	12.55	0.96	0.25	3.10
LV-3: Public Water Works				6.98	0.19			7.94	7.23	10.08			
LV-4: LT Industries				8.99	2.20			9.95	9.24	12.09			
LV-5: Agriculture & allied activities				6.02	(0.77)			6.98	6.27	9.12			
LV-6: E-Vehicle/ E-Rickshaws Charging Stations				6.79	0.00			7.75	7.04	9.89			
HV-1: Railway Traction				5.42	(1.37)			6.38	5.67	8.52			
HV-2: Coal Mines				8.73	1.93			9.68	8.97	11.83			
HV-3: HT Industrial, Non-Industrial and Shopping Malls				7.55	0.76			8.51	7.80	10.65			
HV-4: Seasonal & Non Seasonal				8.42	1.63			9.38	8.67	11.53			
HV-5: Irrigation, Public Water Works and Other than Agricultural				7.85	1.05			8.80	8.09	10.95			
HV-6: Bulk Residential Users				7.57	0.78			8.53	7.82	10.67			
HV-7: Synchronization and Start-Up Power				10.95	4.15			11.90	11.19	14.05			
HV 8: E-Vehicle/ E-Rickshaws Charging Stations				6.79	0.00			7.75	7.04	9.89			
HV 9: Metro Rail				6.79	0.00			7.75	7.04	9.89			

Queries on banking by UPERC

1. Do we have a compilation of Banking of Energy provisions for Captive/ non captive RE generators in various State Regulations. Are the provisions different for captive?
2. On what time period is the % of Banking computed. Is it on 15 minute time slot, or on a per day or month or quarter basis?
3. What is the % of Banking provided in various Regulations?
4. Is the % of banking computed as % of Generation or of Consumption? UP CRE Regulations provide for 100% banking of generation.
5. Is banking agreement signed with RE generators for their full capacity irrespective of connected load of its consumers, or is it provided as a % of connected load or consumption irrespective of generation.
6. What is the period provided within which the banked energy can be consumed? UP CRE 2019 Regulations provide for utilization within Q+2.
7. What happens to the balance energy after settlement period? Does it stand sold to licensee. If so, at what rate/unit ? Is it in terms of % Units banked or % of value?
8. What are the rates of banking charges/ Is it taken as % of units banked?
9. What is the time period of the day in which banked energy can be utilized? Is it that it can be consumed in same 15-minute slot in which it was banked, or is it in a TOD slot, or is the period much larger like peak and off-peak, or is it provided that it can be used any time of the day?
10. Is it provided in any State that banked power in a time slot during the day can be utilized in any other time slot irrespective of peak or off-peak hours? Are higher rates of banking charges provided in such cases. For example, if banking charges are 6% for off-peak to off-peak, do we have higher rates say 12% if we bank in off-peak and use it in peak hours.
11. Who banks power if generator and user located in different DISCOMs within a State or different States, one example being consumer in NPCL and generator in UPPCL.

Approach for determination of green tariff

Case I

A: Determination of RE Power Purchase Cost (incl. Transmission charges & T&D losses)



B: Determine Cross Subsidy Charge as diffn in ABR-ACoS or as determined by SERCs or subject to cap of 20% of ACoS)



C: Determine wheeling charges



D. Green Tariff: A+B+C

Case II

A: Determination of RE Power Purchase Cost (incl. Transmission charges & T&D losses)



B: Determine Cross Subsidy Charge as diffn in ABR-ACoS or as determined by SERCs or subject to cap of 20% of ACoS)



C: Determine fixed cost of power purchase from conventional generators



D: Determine distribution cost/ service charge



E. Green Tariff: A+B+C+D



F: Green Energy Charge for Consumer category incremental above **ABR** of respective consumer category

Case III

A: Determination of RE Power Purchase Cost (incl. Transmission charges & T&D losses)



B: Determine Cross Subsidy Charge as diffn in ABR-ACoS or as determined by SERCs or subject to cap of 20% of ACoS)



C: Determine distribution cost/ service charge



D. Green Tariff: A+B+C

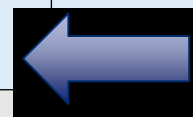


E: Green Energy Charge for Consumer category incremental above **ACoS**

Case I: Green Tariff Computation as per GEOA Rules

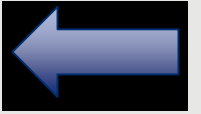
- Green tariff is computed as per the method given in Case I for 8 DISCOMs in Maharashtra, Karnataka, Andhra Pradesh and Madhya Pradesh.

Particulars		MSEDCL	TPC-D	AEML-D	BESCOM	HESCOM	APSPDCL	APCPDCL	MP DISCOMs
Average pooled power purchase cost of RE (INR/ Unit)	A	3.64	3.25	3.49	3.22	2.63	3.57	3.57	3.33
PU transmission charges	A1	0.68	0.50	0.45	0.96	0.86	0.56	0.55	0.60
T&D Loss factor	A2	13.5%	3.8%	12.4%	12.5%	17.5%	9.5%	10.6%	19.8%
Average pooled power purchase cost of RE adjusted for T&D Loss factor & Tx charges (INR/ Unit)	$A3 = A / (1 - A2) + A1$	4.89	3.88	4.43	4.64	4.04	4.51	4.55	4.75
Cross subsidy charge (INR/ Unit)	B	1.23	0.75	0.41	0.45	1.74	1.51	1.52	0.61
Wheeling charge (INR/ Unit)	C	0.60	0.97	1.00	0.33	0.42	0.47	0.47	0.16
Green tariff (INR/ Unit)	D = A3+B+C	6.72	5.60	5.84	5.42	6.20	6.48	6.54	



Case II: Green Tariff Computation as per MPERC Methodology incremental above ABR

- Green Energy Charge is computed as per the approach adopted by MPERC in FY 2023-24 tariff order for 8 DISCOMs in Maharashtra, Karnataka, Andhra Pradesh and Madhya Pradesh.
- Further incremental green energy charge is determined on and above ABR for HT Industry category.

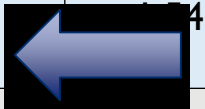


Particulars		MSEDCL	TPC-D	AEML-D	BESCOM	HESCOM	APSPDCL	APCPDCL	MP DISCOMs
Average pooled power purchase cost of RE adjusted for T&D Loss factor & Tx charges (INR/ Unit)	A	4.89	3.88	4.43	4.64	4.04	4.51	4.55	4.75
Cross subsidy charge (INR/ Unit)	B	1.23	0.75	0.41	0.45	1.74	1.51	1.52	0.61
Fixed cost of power purchase (INR/ Unit)	E	1.76	1.35	1.05	2.42	1.58	1.40	1.41	1.72
Distribution Cost / Prudent Service Charge (INR/Unit)	F	1.72	1.44	2.56	1.73	1.84	2.20	2.19	1.25
Green tariff (INR/ Unit)	G = A+B+E+F	9.60	7.42	8.44	9.24	9.20	9.61	9.67	8.33
ABR- HT Industry	H	9.69	9.17	8.98	10.07	11.39	9.37	9.45	7.40
Green Energy Charge (GEC) = GT – ABR (incremental above ABR)	I = G-H	-	-	- 45	-	-	0.24	0.22	0.93

Case III: Green Tariff Computation as per MPERC Methodology incremental above ACoS

- Green Energy Charge is computed as per the approach adopted by MPERC in FY 2023-24 tariff order for 8 DISCOMs in Maharashtra, Karnataka, Andhra Pradesh and Madhya Pradesh.
- Further incremental green energy charge is determined on and above ACoS.

Particulars		MSEDCL	TPC-D	AEML-D	BESCOM	HESCOM	APSPDCL	APCPDCL	MP DISCOMs
Average pooled power purchase cost of RE adjusted for T&D Loss factor & Tx charges (INR/ Unit)	A	4.89	3.88	4.43	4.64	4.04	4.51	4.55	4.75
Cross subsidy charge (INR/ Unit)	B	1.23	0.75	0.41	0.45	1.74	1.51	1.52	0.61
Distribution Cost / Prudent Service Charge (INR/Unit)	F	1.72	1.44	2.56	1.73	1.84	2.20	2.19	1.25
Green tariff (INR/ Unit)	G = A+B+F	7.84	6.07	7.40	6.82	7.62	8.21	8.25	6.61
ACoS (INR/ Unit)	H	8.46	8.42	8.57	9.62	8.69	7.53	7.59	6.79
Green Energy Charge (GEC) = GT – ACoS (incremental above ABR)	I = G-H	1.14	-	-	-	0.51	2.08	2.08	1.14



Results of Green Tariff determined as per the 3 Cases

Green Tariff is determined as per the 3 cases in table below for HT Category of selected DISCOMs:

Particulars		MSEDCL	TPC-D	AEML-D	BESCOM	HESCOM	APSPDCL	APCPDCL	MP DISCOMs
Applicable Tariff for HT Industry Incl. Green energy Tariff (INR/ Unit)	Case 1: Green Tariff as per GEOA Rules	6.72	5.60	5.84	5.42	6.20	6.48	6.54	5.52
	Case 2: Green Tariff as per MPERC method (Incremental above ABR)	9.60	7.42	8.44	9.24	9.20	9.61	9.67	8.33
	Case 3: Green Tariff as per MPERC method (Incremental above ACoS)	7.84	6.07	7.40	6.82	7.62	8.21	8.25	6.61
ACoS (INR/ Unit)		8.46	8.42	8.57	9.62	8.69	7.53	7.59	6.79
% Green tariff w.r.t. ACoS	Case 1: Green Tariff as per GEOA Rules	79%	67%	68%	56%	71%	86%	86%	81%
	Case 2: Green Tariff as per MPERC method (Incremental above ABR)	113%	88%	99%	96%	106%	128%	127%	123%
	Case 3: Green Tariff as per MPERC method (Incremental above ACoS)	93%	72%	86%	71%	88%	109%	109%	97%

Analysis of Renewable Purchase Obligation & RE consumption obligation

Comparison of RPO and Minimum share of Non-fossil fuel Consumption Target (I/2)

Sr. No.	Particular	RPO & ESO Trajectory till 2029-30	Minimum Share of consumption from Non-Fossil Fuel (RE) Sources
1.	Notification Date	MoP Notification on 22 July 2022 & Corrigendum on 19 September 2022	MoP Notification on 20 October 2023
2.	Title	Renewable Purchase Obligation (RPO) and Energy Storage Obligation trajectory till 2029-30	Minimum Share of Consumption of Non-fossil Fuel Sources (RE) by designated consumers as energy or feedstock
3.	Effective Period	FY 2022-23 to FY 2029-30	FY 2024-25 to FY 2029-30
4.	Issuance under	<p><u>Electricity Act, 2003</u></p> <p>Section 86. (Functions of State Commission): — (1) The State Commission shall discharge the following functions, namely: -</p> <p>(e) promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee;</p>	<p><u>Energy Conservation Act, 2001</u></p> <p>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.....</p> <p><i>(Section 14 of EC Act: Power of Central Government to enforce efficient use of energy and its conservation)</i></p>
5.	Nodal Agency	POSOCO	Bureau of Energy Efficiency (BEE)
6.	Obligated Entities	<ul style="list-style-type: none"> Distribution Licensees Open Access Consumers Captive Users 	<ul style="list-style-type: none"> Designated Consumers and other Designated Consumers who are captive or open access consumers.

Comparison of RPO and Minimum share of Non-fossil fuel Consumption Target (2/2)

Sr. No.	Particular	RPO & ESO Trajectory till 2029-30	Minimum Share of consumption from Non-Fossil Fuel (RE) Sources
7.	RPO Targets categories	<ul style="list-style-type: none"> RPO-Wind HPO RPO-Other ESO 	<ul style="list-style-type: none"> Wind RE Hydro RE Distributed RE Other RE
8.	Role of SERCs	<ul style="list-style-type: none"> Under EA 2003, all the functions are given of framing the regulations to SERCs 	<p>Under EC (Amendment) act, 2022, SERCs shall make regulations for discharging the functions given in the EC act.</p> <p><i>(Section 27(A) on Power of State Commission to make regulations newly inserted)</i></p>
9.	Enforcement, monitoring & reporting	<ul style="list-style-type: none"> POSOCO shall maintain the data related to compliance of RPO. SERCs should come up with RPO targets in every control period and SLDCs/ SDAs operates as nodal agency to monitor RPO compliance of obligated entities. 	<ul style="list-style-type: none"> BEE shall maintain data related to compliance of renewable energy utilization by the designated consumer(s) and submit report to the Central Government. <i>(Clause 7 of MoP Notification)</i> Central Govt. in consultation with BEE directs every designated consumer to comply with energy consumption norms and standards; <i>(Section 14 of EC Act)</i> State govt. designates any agency as designated agency to coordinate, regulate & enforce provisions of EC Act within the State. <i>(Section 15 (d) of EC Act 2001)</i>
10.	Penalty	As decided by SERCs	<p><u>Penalty</u></p> <p>Shortfall in specified RE targets leads to non-compliance and incurs penalties as per section 26(3) of the EC Act Amendment, 2022</p> <ul style="list-style-type: none"> Max of INR 10 lakhs for each failure. Additional penalty which shall not exceed twice the price of every MToE prescribed under this Act, which is in excess of the prescribed norms.

Comparison of RPO and Minimum Non-fossil Fuel Consumption Targets

	RPO & ESO Trajectory till 2029-30					Minimum Share of consumption from Non-Fossil Fuel (RE) Sources				
Year	Wind RPO	HPO	Other RPO	Total RPO	ESO	Wind RE	Hydro RE	Distributed RE*	Other RE	Total RE
2022-23	0.81%	0.35%	23.44%	24.61%	-	-	-	-	-	-
2023-24	1.60%	0.66%	24.81%	27.08%	1.0%	-	-	-	-	-
2024-25	2.46%	1.08%	26.37%	29.91%	1.5%	0.67%	0.38%	1.50%	27.35%	29.91%
2025-26	3.36%	1.48%	28.17%	33.01%	2.0%	1.45%	1.22%	2.10%	28.24%	33.01%
2026-27	4.29%	1.80%	29.86%	35.95%	2.5%	1.97%	1.34%	2.70%	29.94%	35.95%
2027-28	5.23%	2.15%	31.43%	38.81%	3.0%	2.45%	1.42%	3.30%	31.64%	38.81%
2028-29	6.16%	2.51%	32.69%	41.36%	3.5%	2.95%	1.42%	3.90%	33.10%	41.36%
2029-30	6.94%	2.82%	33.57%	43.33%	4.0%	3.48%	1.33%	4.50%	34.02%	43.33%

Particular	RPO & ESO Trajectory till 2029-30	Minimum RE Consumption for Designated Consumers
Total Target	Total RPO target is inline with Total RE consumption target	
Wind Target	WPPs commissioned after 31 March 2022 and Wind Energy consumed over & above 7% from WPPs commissioned till 31 March 2022	WPPs commissioned after March 31, 2024
Hydro	HPPs (including PSPs and SHPs) commissioned after 8 March 2019	HPPs (including PSP & SHP) commissioned after March 31, 2024
Distributed RE	-	Distributed RE sourced from projects less than 10 MW. *For hilly and North-Eastern States/Union Territories, DER target shall be 50% of the given targets.
Other	any RE project not mentioned in Wind RPO & HPO sources	any RE project not specified in Wind RE, Hydro RE & DRE component sources

Key Findings and Points for Discussion (1/3)

Key Issues/ Findings	Discussion Point
<p>Issue-1:Applicability of RPO Framework</p> <ul style="list-style-type: none"> • As per MoP Order dated 22 June 2022, RPO targets from FY 2022-23 to FY 2029-30 are defined in pursuance of Electricity Act 2003. • As per MoP notification dated 20 October 2023, Minimum RE/Non-fossil fuel consumption target are notified in pursuance of EC Act 2001 from FY 2024-25 to FY 2029-30. • <i>This notification shall come into force on the 1st day of April, 2024 and till such time, the RPO trajectory specified in paragraphs 5 to 14 vide the Ministry of Power Order No. 9/13/2021-RCM, dated 22nd July, 2022 read with Corrigendum, dated the 19th September, 2022, shall remain in force</i> 	<ul style="list-style-type: none"> • Will Non-fossil fuel consumption obligation (or renewable consumption obligation - RCO) as specified by MoP replace existing Renewable Purchase Obligation (RPO) framework specified by SERCs under S86(1)(e) under EA2003?
<p><u>Issue-2:Applicable Act/ legal status:</u></p> <ul style="list-style-type: none"> • Under Section 86 (1)(e) of EA 2003, SERCs have been assigned responsibility to define RPO targets. • Under Section 27 of EC Act 2001, SERC has been assigned a responsibility to appoint any of its members as an “Adjudicating Officer”. • As per EC Act (Amendment), 2022, Section 27A, SERCs shall make regulations for discharging the functions given in the EC Act 2001. 	<ul style="list-style-type: none"> • Is there a need to issue separate regulations to notify non-fossil fuel targets to DCs or notification issued by MoP suffice (like targets given to DCs under Perform,Achieve & Trade Scheme)? • Can SERCs frame regulations u/s 181 of EA2003 for minimum non-fossil fuel consumption) targets under Section 27A of EC Act Amendment 2022 or the scope of such Regulations will have to be limited to issues of enforcement and adjudication?

Key Findings and Points for Discussion (2/3)

Key Issues/ Findings	Discussion Point
<p><u>Issue-3: Targets to be met on purchase or consumption of electricity/ energy :</u></p> <ul style="list-style-type: none">• RPO targets are set on purchase of electricity as per EA, 2003 and regulations issued by SERCs.• It appears that, minimum non-fossil fuel consumption targets will be applicable on energy consumed by DCs as energy or feedstock.• DISCOM being DCs, will the targets be applicable on DISCOMs self-consumption/ auxiliary consumption including energy lost in T&D losses or it will be applicable on overall energy sales of DISCOMs?	<ul style="list-style-type: none">• Whether minimum RE consumption targets to be applicable on energy consumption / electricity consumption of DCs?
<p><u>Issue-4: Unit to be considered to meet RE consumption targets:</u></p> <ul style="list-style-type: none">• RPO targets are applicable on energy consumption of obligated entities in MUs.• Whereas as per EC Act 2001, designated consumers shall meet minimum RE consumption targets based on their consumption of energy or feedstock.• Baseline energy consumption norms and standards for designated consumers except DISCOMs are in metric tonnes of oil equivalent (TOE).• 1 TOE = 11,630 kWh	<ul style="list-style-type: none">• While framing regulations of minimum RE consumption, the factor of unit shall be mentioned specifically for DISCOMs and designated consumers.

Key Findings and Points for discussion (3/3)

Key Issues/ Findings	Discussion Point
<p><u>Issue-5: Obligated Entities</u></p> <ul style="list-style-type: none"> Under RPO, DISCOMs, OA Consumers and Captive consumers are the obligated entities. Whereas under minimum RE consumption targets, different designated consumers in respect of electricity distribution licensee and other designated consumers who are open access consumers or captive users are the obligated entities. <p><i>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.....</i></p> <ul style="list-style-type: none"> At present, total 13 energy intensive sectors are under PAT Scheme such as Aluminium, Cement, Iron & Steel, Chlor-Alkali, DISCOM, Fertilizer, Pulp & Paper, Textile, Building (Hotels), Thermal Power Plants, Petrochemical, Petroleum Refinery and Railways. It covers around 1196 designated consumers (as on PAT Cycle VII). Further, open access consumers: 5,628 (4967 & 661 under IEX & PXIL in FY 2021-22) No. of industries under captive: 8,556 (FY 2020-21 as per CEA General Review Report) 	<ul style="list-style-type: none"> Only Designated Consumers and other Designated Consumers who are open access consumers or captive users are covered under non-fossil fuel obligation. Open Access Consumers & Captive Consumers which are not from Designated Sectors will be left out. Treatment for left out obligated entities which are presently covered under RPO framework shall be clearly defined.
<p><u>Issue-6: Compliance Monitoring & Enforcement of RPO for designated consumers:</u></p> <ul style="list-style-type: none"> As per MoP Notification dated 20 October 2023, Minimum RE Consumption target are applicable for designated consumers and other designated consumers who are Open Access and Captive Consumers. It is important to set effective monitoring & compliance framework. 	<ul style="list-style-type: none"> Detailed guidelines are required defining roles & responsibilities of Central & State Agencies for compliance monitoring, reporting and enforcement.

Sample illustration

RPO targets for MSEDCL as per MERC RPO regulations, 2019 for FY 2024-25 Vs Minimum RE consumption targets for FY 2024-25

As per MERC RPO Regulations 2019	MSEDCL	As per minimum Non-fossil Fuel consumption target notification/ RE Consumption Obligation (RCO)	MSEDCL	As per minimum Non-fossil Fuel consumption target notification/ RE Consumption Obligation (RCO)	MSEDCL
Power Purchase Quantum (MU)	1,48,137	Energy available for sale	1,27,913	Energy required for self consumption and T&D loss of DISCOM	20,224
RPO target: Total (%)	25.00%	RCO: Total (%)	29.91%	RCO: Total (%)	29.91%
RPO target: Solar (%)	13.50%	RCO: wind (%)	0.67%	RCO: wind (%)	0.67%
RPO target: Non solar(%)	11.50%	RCO: hydro (%)	0.38%	RCO: hydro (%)	0.38%
		RCO: DER (%)	1.50%	RCO: DER (%)	1.50%
		RCO: Other (%)	27.35%	RCO: Other (%)	27.35%
RPO target: Total (MU)	37,034	RCO: Total (MU)	38,258.78	RCO: Total (MU)	6,049.00
RPO target: Solar (MU)	19,998	RCO: wind (MU)	857.02	RCO: wind (MU)	135.50
RPO target: non-solar (MU)	17,036	RCO: hydro (MU)	486.07	RCO: hydro (MU)	76.85
		RCO: DER (MU)	1,918.70	RCO: DER (MU)	303.36
		RCO: Other (MU)	34,984.21	RCO: Other (MU)	5,531.26

- If RCO are made applicable on consumption by Obligated Entity (or sale of electricity within area of obligated entities), then there won't be significant difference in absolute quantum of RE purchase, as higher RCO targets will offset T&D loss factor.
- If RCO is applicable on self-consumption and T&D loss of DISCOMs, RE purchase of DISCOMs will be much lower.



Way forward for deliberation : RPO Vs Minimum RE Consumption Targets

- Managing conflicts for RCO mandates under EC Act 2001 and RPO targets under EA 2003
 - Regulatory framework for RPO under EC Act 2001: *Clarity shall be provided to SERCs to develop regulatory framework in line with MoP notification on Minimum RE Consumption targets.*
 - Nodal agency for Monitoring and Enforcement (BEE/SNA and SERC): *Clarity shall be provided on roles and responsibilities of nodal agencies involved.*
 - Designated Consumers and Obligated Entities: *Detailed procedure and framework for enrolment, monitoring and reporting of designated consumers will be mandatory.*
 - Enforcement and compliance penalties

“Improving the Effectiveness of Regulatory Framework in the Electricity Sector”



Anoop Singh
Centre for Energy Regulation (CER)

Department of Management Sciences (DoMS)

Indian Institute of Technology Kanpur

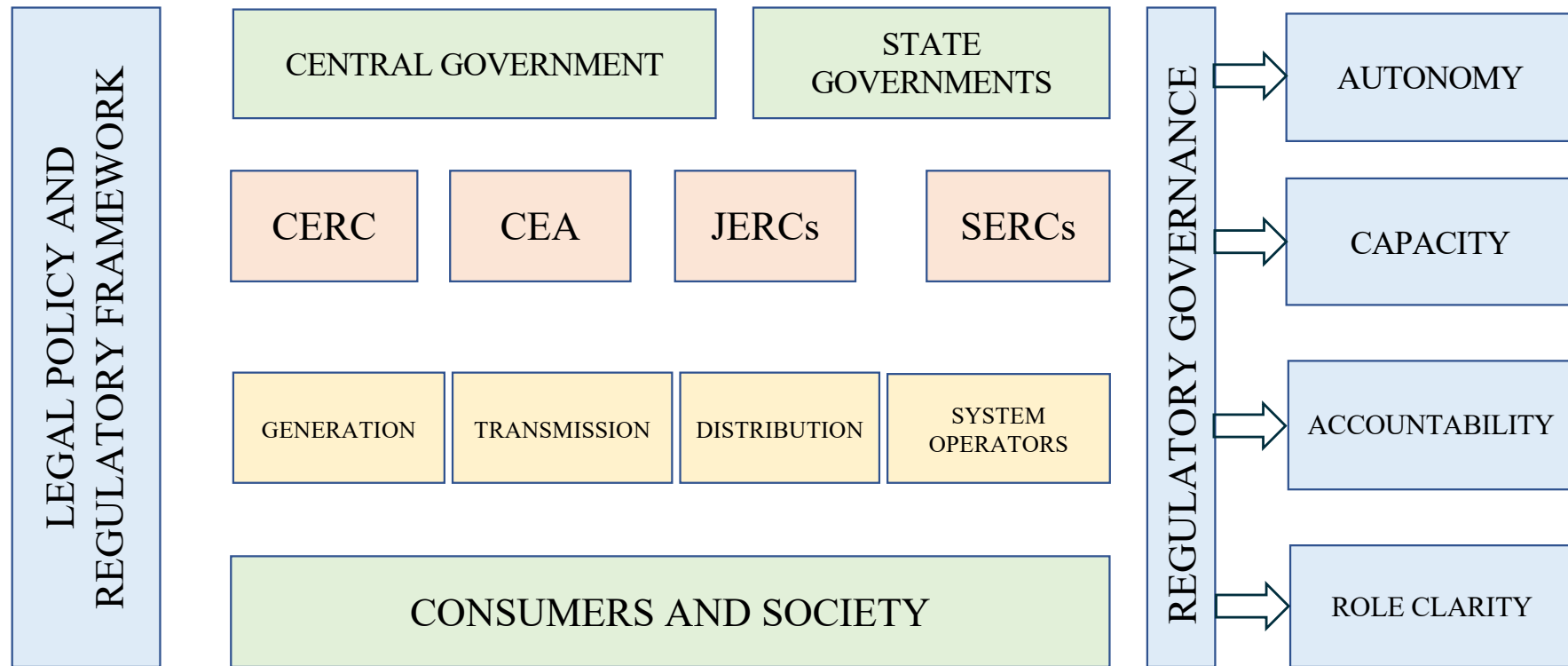
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Contents

- Objectives
- Research Agenda
- Methodology
- Financial Autonomy
- Functional Autonomy
- Role Clarity
- Capacity
- Accountability

Regulatory Governance in the Indian Power Sector



So.: CER, IIT Kanpur

Objectives

- To study the current electricity regulatory governance scenario in the country, both at the Union and State levels.
- To identify the factors that hinder regulatory effectiveness.
- To identify legislative, policy and regulatory changes to improve the regulatory framework in the electricity sector.

Research Agenda

Comparative analysis of the governance framework within ERCs by examining the following key aspects (but not limited to)

- Autonomy
- Capacity
- Accountability
- Role Clarity

Methodology

- i. Literature Review - Regulatory Landscape - Indian Power Sector
- ii. Literature Review - Regulatory Governance - International Context
- iii. Identify relevant parameters related to the regulatory governance/ processes across parameters covering Autonomy, Role Clarity, Capacity and Accountability
- iv. Data collection from secondary sources
- v. Design of questionnaires for additional data collection
- vi. Data analysis and preliminary results
- vii. Stakeholder consultation
- viii. Additional data collection, analysis leading to final results
- ix. Recommendations

Questionnaire

List of Meetings with stakeholders

S.No.	Meetings	Meeting held on
1	Mr. V P Raja	04.11.2022
2	Mrs Anjuli Chandra	08.11.2022
3	Mr. Pramod Deo	19.11.2022
4	Mr. Sanjay Srivastava	12.12.2022
5	UPERC	14.12.2022
6	UERC	09.12.2022
7	CSERC	09.12.2022
8	WBERC	18.01.2023
9	JERC M&M	09.01.2023
10	DERC	12.01.2023
11	TERC	12.01.2023
12	APSERC	13.01.2023
13	MSERC	13.01.2023
14	RERC	18.01.2023
15	JERC Goa & UTs	23.01.2023

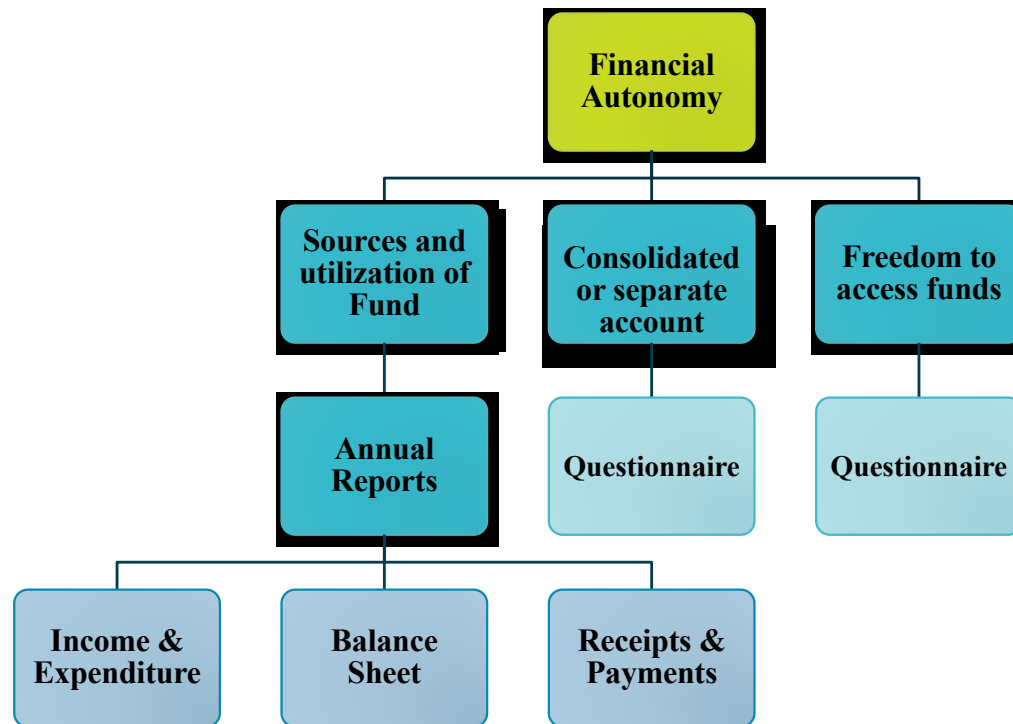
Questionnaires Received

S. No.	ERC	Questionnaires received on
1	MSERC	31.01.2023
2	JERC M&M	07.02.2023
3	CSERC	08.02.2023
4	HPERC	10.02.2023
5	UPERC	22.02.2023
6	SSERC	15.02.2023
7	RERC	26.05.2023
8	TNERC	11.09.2023

Note: Reminder through mail and call has been given to each ERC on 28.12.2022, 11.01.2023, 29.01.2023 and 08.02.2023, 16.10.2023.

Financial Autonomy

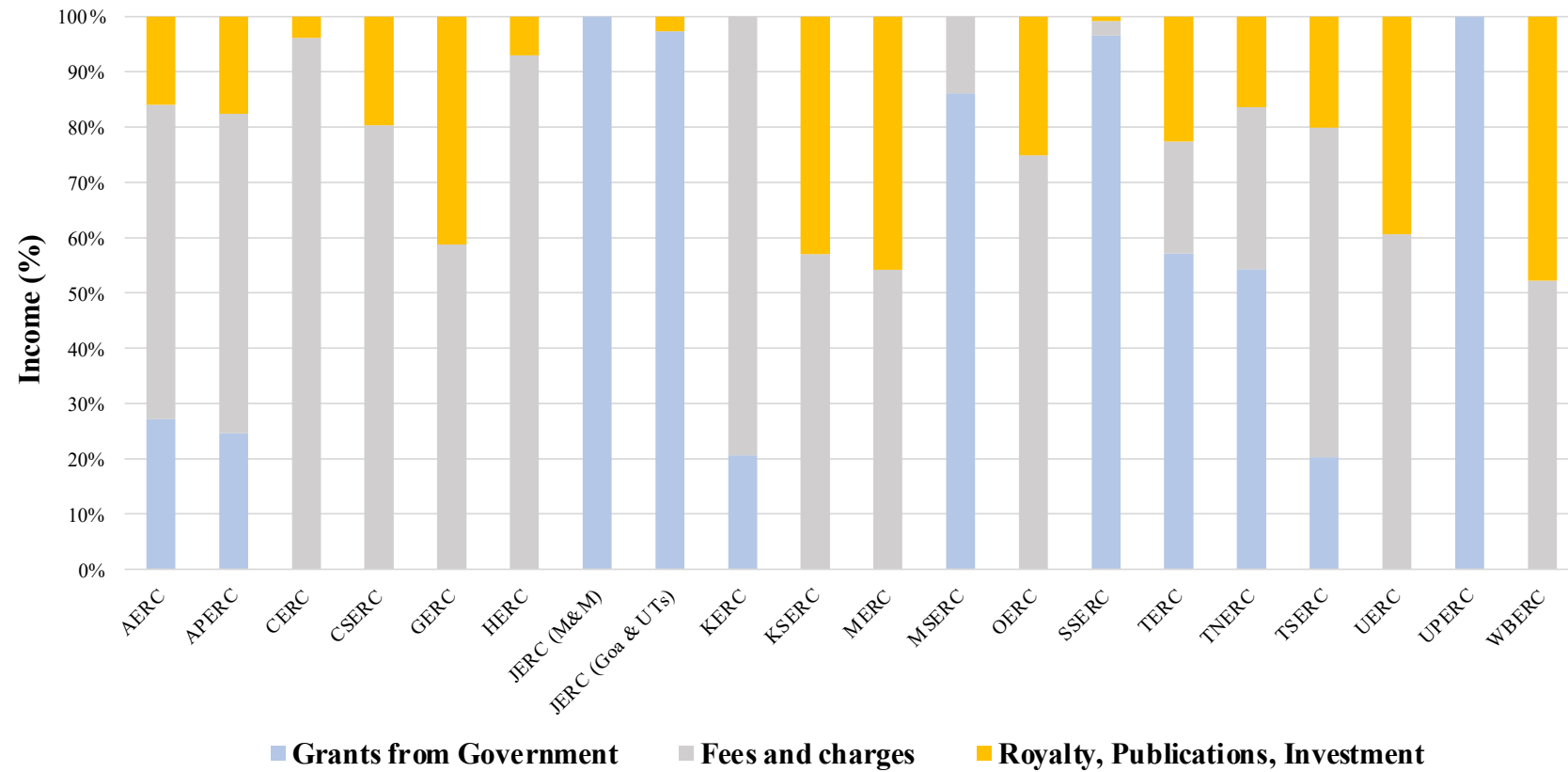
Financial Autonomy



Establishment of ERC Fund

ERC Name	Establishment of ERC Fund as per Section 99/103 of the Act
AERC	FY-05
APERC	FY-15
CERC	FY-19
GERC	FY-05
HERC	FY-15
JERC (Goa & UTs)	Prior to FY-10
KERC	FY-13
MSERC	FY-14
OERC	FY-06
PSERC	FY-07
RERC	Prior to FY-10
SSERC	Prior to FY-11
TNERC	FY-07
TSERC	FY-15

Sources of Income (FY-20)

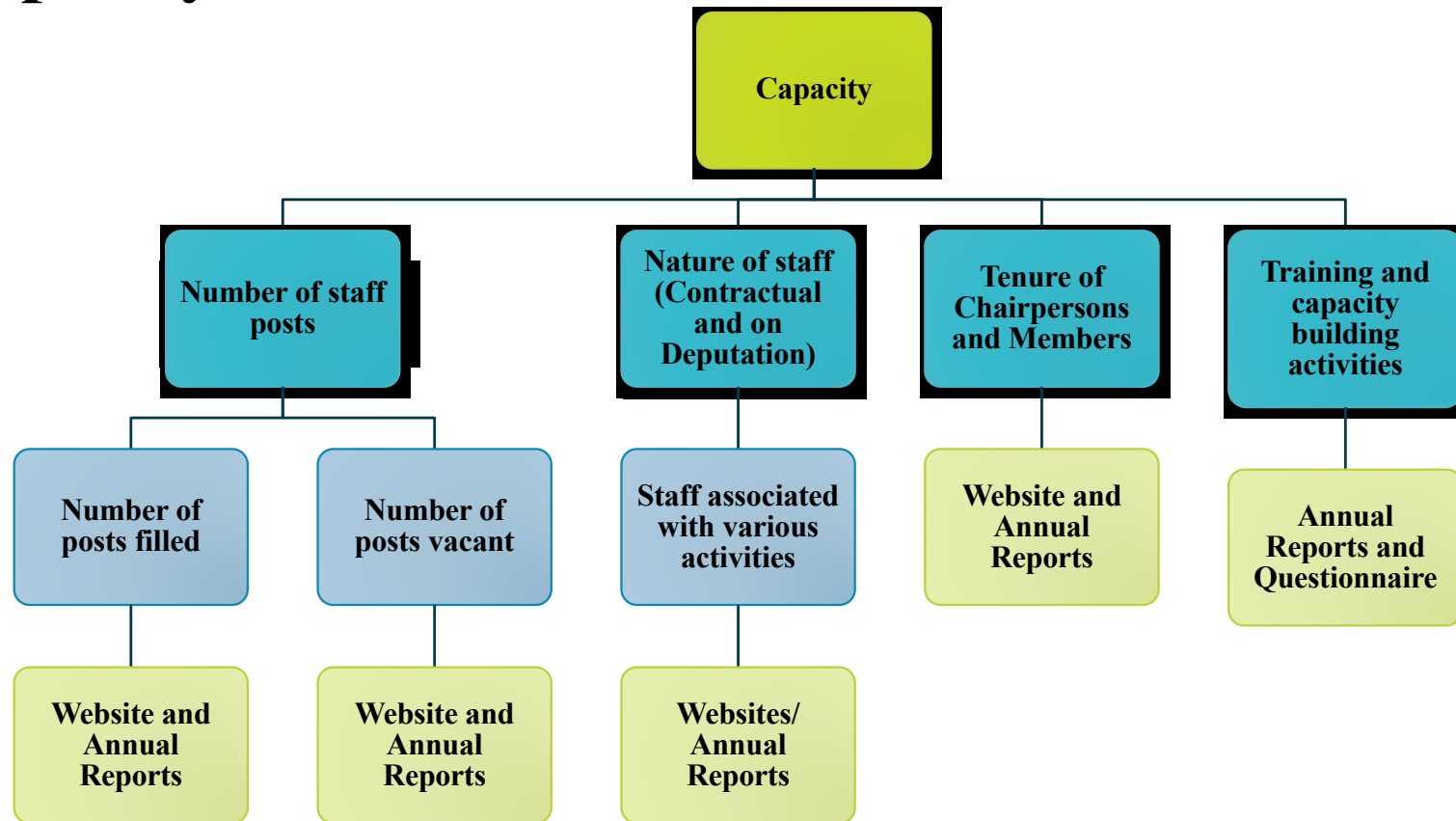


Capacity

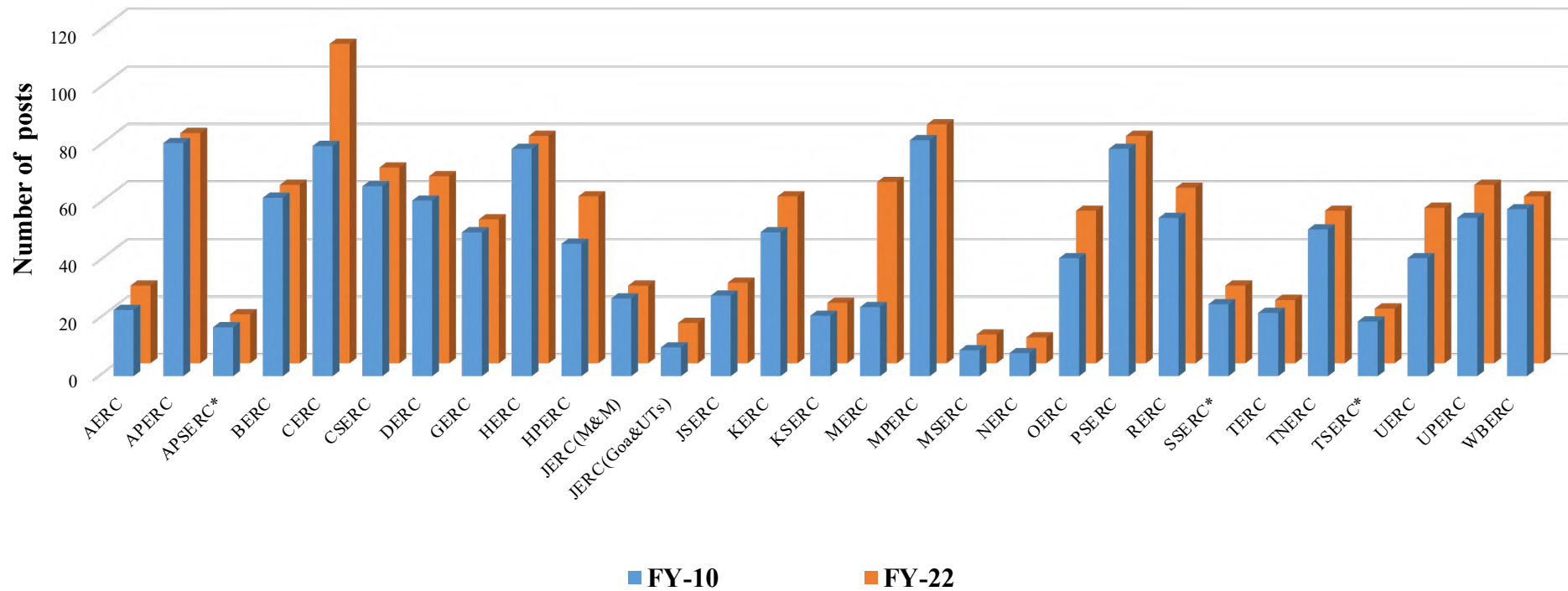
Capacity

- ERCs need sufficient human resources with required technical expertise to carry out various functions.
- An overview of capacity of ERCs are analysed with emphasis on -
 - a. Number of Posts Sanctioned and Posts Filled
 - b. Nature of staff posts and Training
 - c. Capacity building activities of ERCs

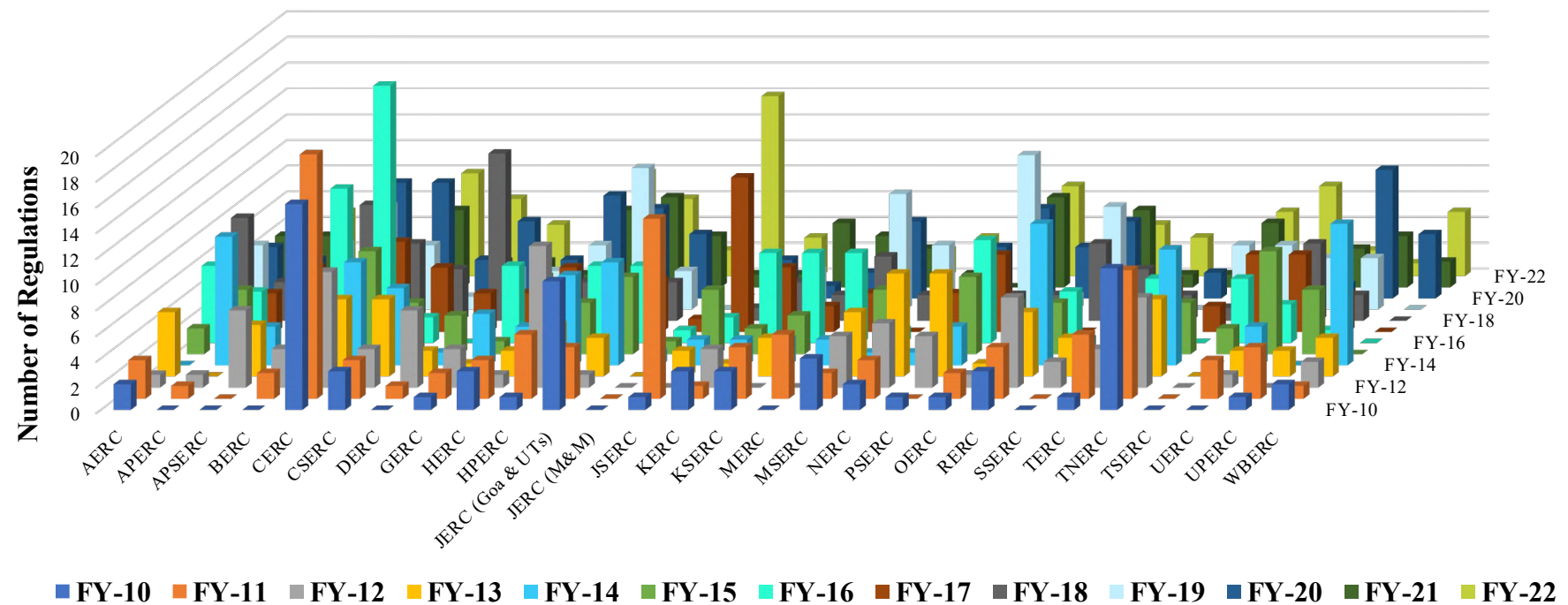
Capacity



Sanctioned Posts in ERCs (2009-10, 2021-22)

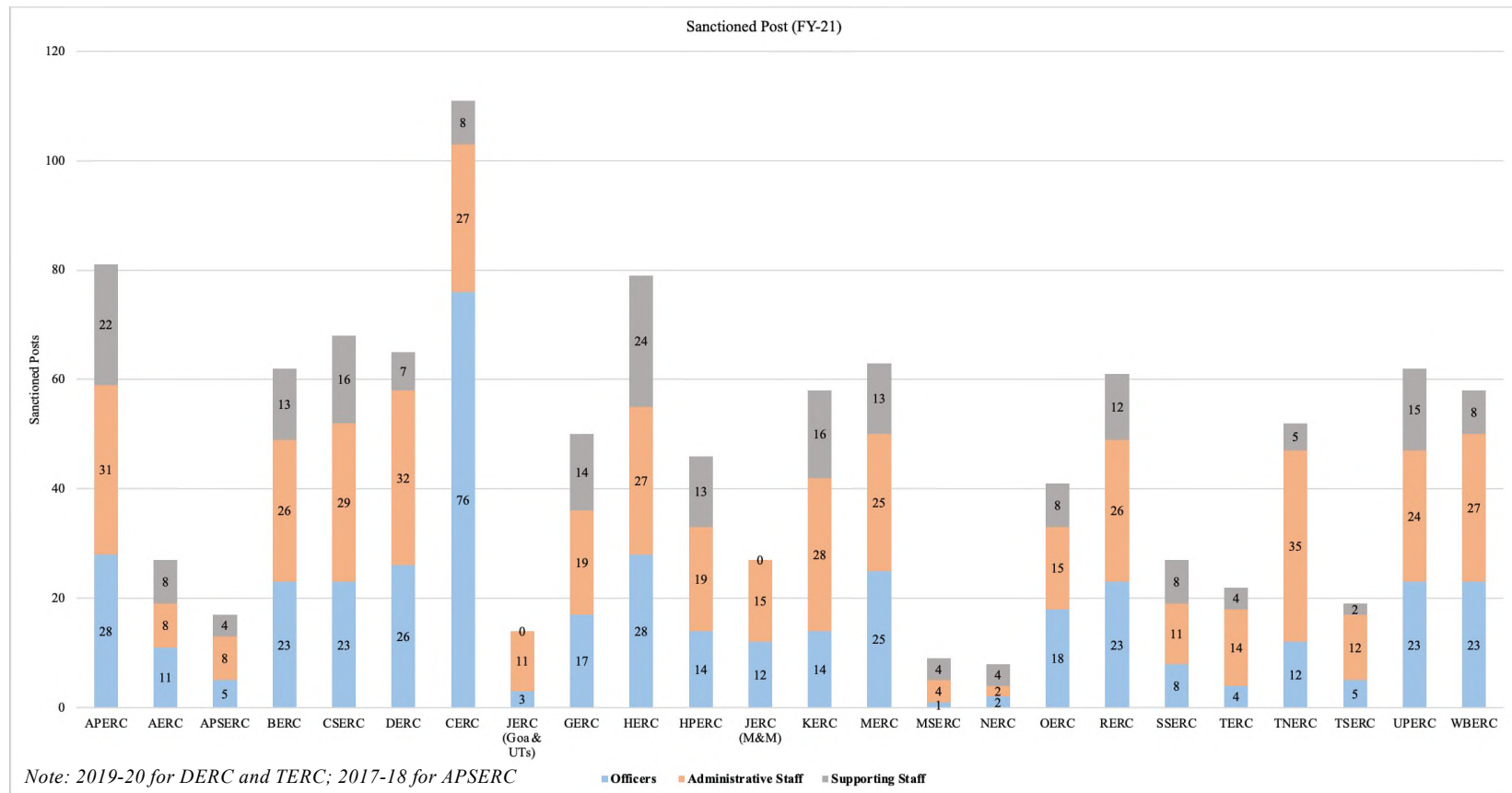


Total Number of Regulations



- Note.* 1. An average of 50 regulations were published on ERCs' web portals from 2009 to 2022.
 2. ERCs with over 70 Regulations HPERC and PSERC.
 3. ERCs with less than 30 Regulations: NERC, OERC, SSERC TSERC and JERC (Goa & UTs).
 4. CERC had the highest total regulations (127), while SSERC had the lowest (12).

Sanctioned Posts (2020-21)

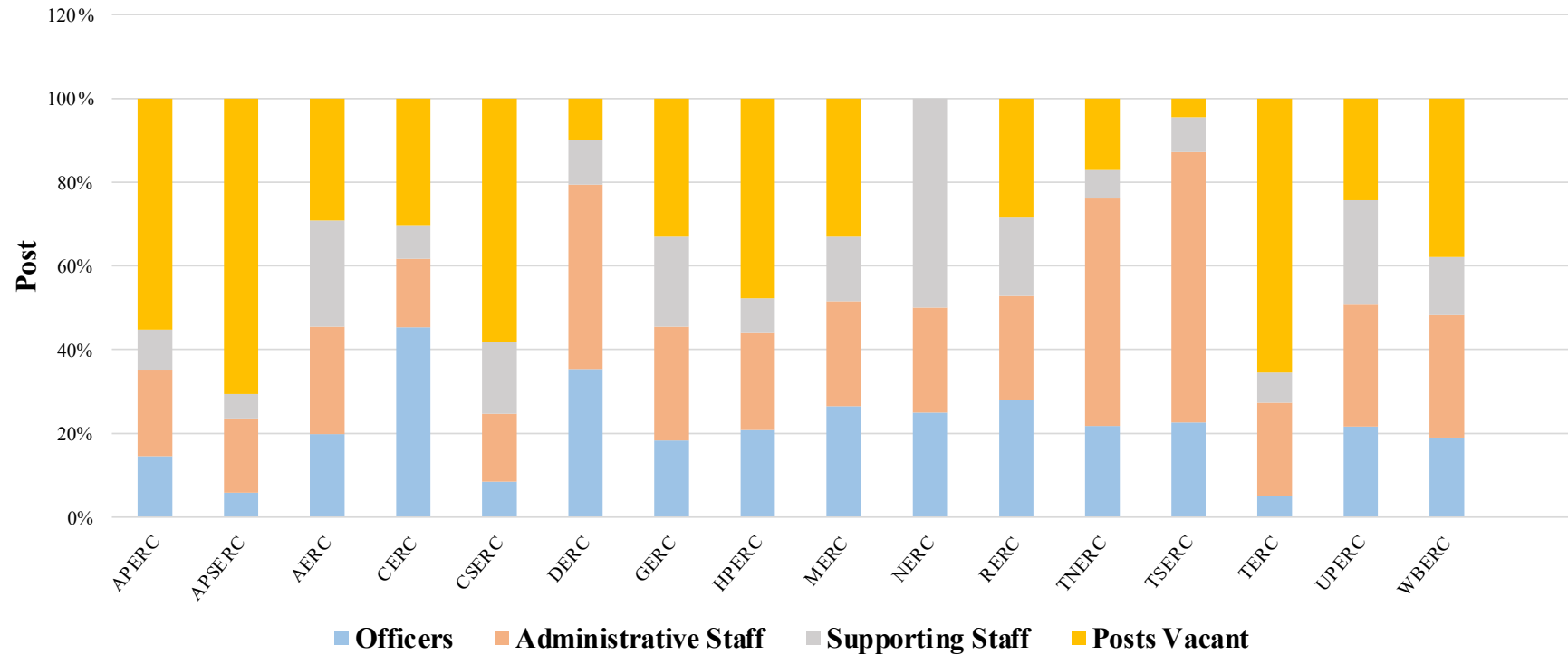


Average Posts Filled (FY-10 to FY-21)

Posts Filled* (%)	ERCs Name					
Below 40%	TERC					
40% to 50%	APERC	CSERC	JERC (Goa & UTs)			
50% to 60%	WBERC	HPERC				
60% to 70%	AERC	GERC	HERC	JERC (M&M)	RERC	CERC
70% to 80%	KSERC	MERC	SSERC	UPERC	UERC	
80% to 90%	KERC	TNERC				
above 90%	APSERC	DERC	MSERC	NERC	OERC	TSERC

Note. 1. '*' denotes the Average Posts Filled throughout the years 2009-10 to 2021-22.
 2. Data of posts filled are not available for MPERC, PSERC, JSERC, and BERC.

Average Filled Posts w.r.t. Sanctioned Posts (FY-10 to FY-21)



Note. Filled post are high w.r.t. sanctioned post due to contract posts additionally filled for MSERC.
Highest number of officers filled in CERC as well as Administrative Staffs are higher in TSERC, MSERC.

Officer's engaged on Deputation, Contract or Permanent basis (FY-10 to FY-22)

Post Name - Commission's Secretary													
ERC	FY-10	FY-11	FY-12	FY-13	FY-14	FY-15	FY-16	FY-17	FY-18	FY-19	FY-20	FY-21	FY-22
AERC													
APERC													
CERC													
CSERC													
DERC													
GERC													
HERC													
JERC (Goa & UTs)													
KERC													
OERC													
TSERC													
WBERC													

	Filled on Permanent basis
	Filled through Deputations
	Filled on Contractual basis
	Vacant
	Data NA
	Not Mentioned
	Private Secretary
	Data from Organization Chart

Note:

APERC Addl. Charge from 2014-15 to 2020-21, Pvt. Secy. for FY-2021-22.

DERC Secretary taken from Organization chart: FY-2011-12 to FY-2019-20.

JERC (Goa & UTs) Addl. Charge from for FY 2009-10, Based on annual report Chart table, it is taken as permanent from FY-2015-16.

KERC For FY-2014-15 - Sri. Capt. Dr. K. Rajendra, KAS serving as secretary, from FY- 2015 to FY-2016.

TSERC Pvt Secy. from FY-2014 to FY-2015.

Officer's engaged on Deputation, Contract or Permanent basis (FY-10 to FY-22)

Post Name - Director (Tariff/ Economics)													
ERC	FY-10	FY-11	FY-12	FY-13	FY-14	FY-15	FY-16	FY-17	FY-18	FY-19	FY-20	FY-21	FY-22
AERC													
APERC													
CERC													
CSERC													
DERC													
GERC													
HERC													
JERC (Goa & UTs)													
KERC													
OERC													
TSERC													
WBERC													

	Filled on Permanent basis
	Filled through Deputations
	Filled on Contractual basis
	Vacant
	Data NA
	Not Mentioned
	Private Secretary
	Data from Organization Chart
	Advisor/ consultant

Note:

APERC **Jt. Director** from FY-2012-13 to FY-2013-14.

CSERC **Jt. Director-** from FY-2014-15 to FY-2019-20.

DERC **Executive Director taken From Organization chart:** FY-2011-12 to FY-2019-20.

TSERC **Deputy Director - TE** from FY-2014-15 to FY-2016-17.

Joint Director – Tariff Engg. from FY-2017-18 to FY-2020-21.

CERC **Chief Advisor (Eco)** for FY-10, FY-11, FY-12, FY-13

Officer's engaged on Deputation, Contract or Permanent basis (FY-10 to FY-22)

Post Name - Director Technical													
ERC	FY-10	FY-11	FY-12	FY-13	FY-14	FY-15	FY-16	FY-17	FY-18	FY-19	FY-20	FY-21	FY-22
AERC													
APERC													
CERC													
CSERC													
DERC													
GERC													
HERC													
JERC (Goa & UTs)													
KERC													
OERC													
TSERC													

	Filled on Permanent basis
	Filled through Deputations
	Filled on Contractual basis
	Vacant
	Data NA
	Not Mentioned
	Data from Organization Chart

Note:

CERC Chief (Engg.) from FY-2009 to FY-2010.

DERC Executive Director taken from Organization chart: From FY-2011-12 to FY-2019-20.

GERC Jt. Director for FY-2009 to FY-10, (from FY-2010-11 to FY-2021-22- not clear for table from Annual Report).

JERC (Goa & UTs) Based on Annual Report chart table.

KERC For FY-2014 to FY-15 Consultants (Tech) from FY-2015-16, FY 2016-17, FY 2017-18.

TSERC Joint Director - IT- from FY-2014-15 to FY-2017-18.

Secretary (FAC) & Joint Director –IT- from FY-2018-19, FY-2019-20, FY-2020-21.

Officer's engaged on Deputation, Contract or Permanent basis (FY-10 to FY-22)

Post Name - Director Finance													
ERC	FY-10	FY-11	FY-12	FY-13	FY-14	FY-15	FY-16	FY-17	FY-18	FY-19	FY-20	FY-21	FY-22
AERC													
APERC													
CERC													
CSERC													
DERC													
GERC													
HERC													
JERC (Goa & UTs)													
KERC													
OERC													
TSERC													

	Filled on Permanent basis
	Filled through Deputations
	Filled on Contractual basis
	Vacant
	Data NA
	Not Mentioned
	Data from Organization Chart
	Advisor/ consultant

Note: AERC **Jt. Director** for FY-18.
 APERC **Jt. Director** from FY-12 to FY-14 and post name for Finance is 'pay and account' from FY-15 to FY-22.
 CERC **Chief (Finance)** from FY-10.
 CSERC **Financial Analyst**- FY-12, FY-15, FY-17, FY-18, FY-19.
 DERC **From Organization chart: Dy. Director for Pay and Accounts** from FY-11 to FY-20.
 GERC **Dy. Director (Admin and Account)** for FY-10, (from FY-11 to FY-22 - not clear for table from annual report).
 JERC (Goa & UTs) **Shri H. K. Ahuja, a DANICS Officer joined as Director (Finance & Law) w.e.f. 15.04.2009 on deputation basis. On deputation till 14.04.2010 and then Vacant, Anish Garg was in Finance & Law from FY-13 to FY-15.**
 KERC **Senior Financial Analyst** for FY-12.
 OERC **Sr. Financial Analyst** for FY-2009-10, FY-2011-12.
Jt. Director (Financial Analyst) – From FY-13, to FY-21.

Officer's engaged on Deputation, Contract or Permanent basis (FY-10 to FY-22)

Post Name - Director Legal													
ERC	FY-10	FY-11	FY-12	FY-13	FY-14	FY-15	FY-16	FY-17	FY-18	FY-19	FY-20	FY-21	FY-22
AERC													
APERC													
CERC													
CSERC													
DERC													
GERC													
HERC													
JERC (Goa & UTs)													
KERC													
OERC													
TSERC													

Note:

	Filled on Permanent basis
	Filled through Deputations
	Filled on Contract basis
	Vacant
	Data NA
	Not Mentioned
	Private Secretary
	Data from Organization Chart
	Advisor/ consultant

APERC

CERC

CSERC

DERC

HERC

JERC (Goa & UTs)

KERC

OERC

Jt. Director from FY-16 to FY-21.

Chief (Legal) from FY-10, **Chief Advisor (Legal)** for FY-11. Dy. **Chief (Legal)** for FY-20, FY-21. **Joint chief (Legal)** for FY-2021to FY-22 by B.Shrikumar, T.D.Pant and V.Sreenivas.

Law officer for FY-2011-12.

Snr. Law officer for FY-13, FY-15, FY-16, FY-17, FY-18, FY-19, FY-20.

Executive Director taken From Organization chart: FY-12, FY-13, FY-15, FY-16 to FY-20.

Law Officer for FY-10 to FY-13, FY-16, FY-21.

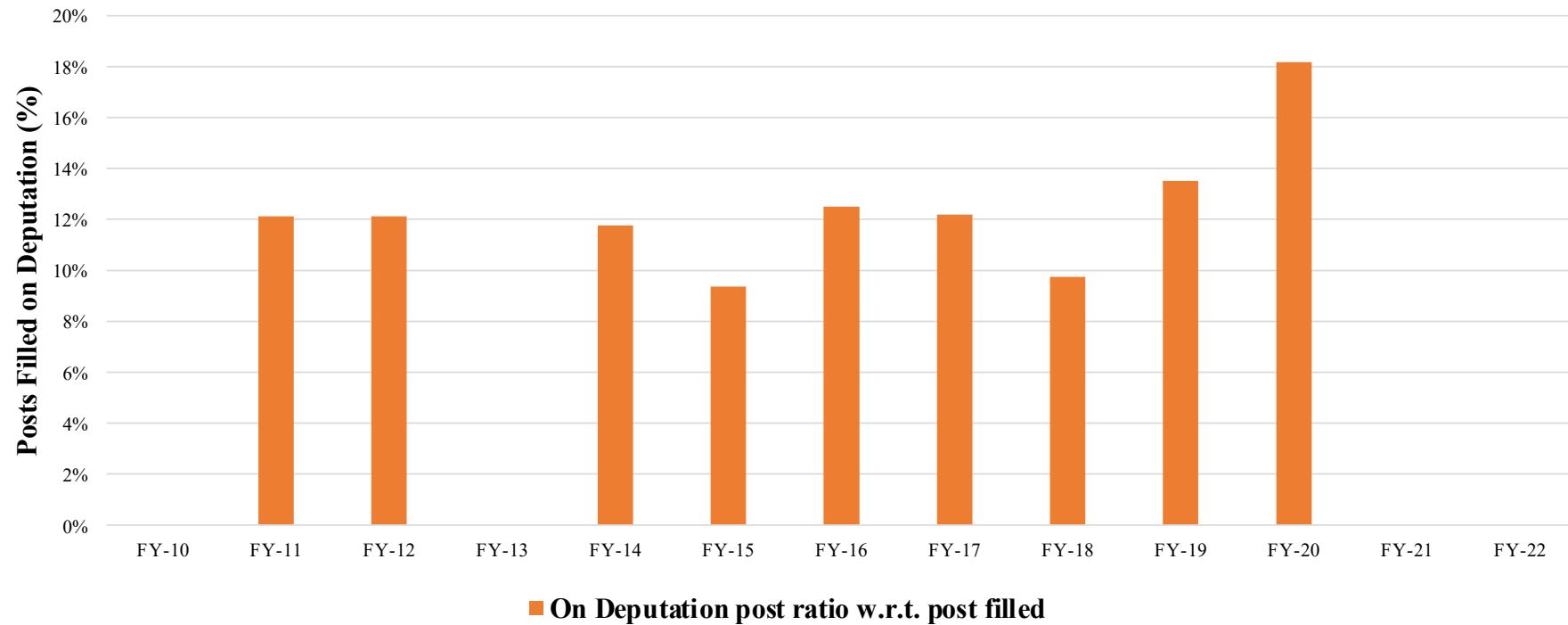
Joint Director (Law) from FY-14 and FY-15.

Shri H. K. Ahuja, a DANICS Officer joined as Director (Finance & Law) w.e.f. 15.04.2009 on deputation basis. On deputation till 14.04.2010 and then Vacant, **Anish Garg** was in Finance & Law from FY-13 to FY-15. **Rinku Gautum** from FY-16.

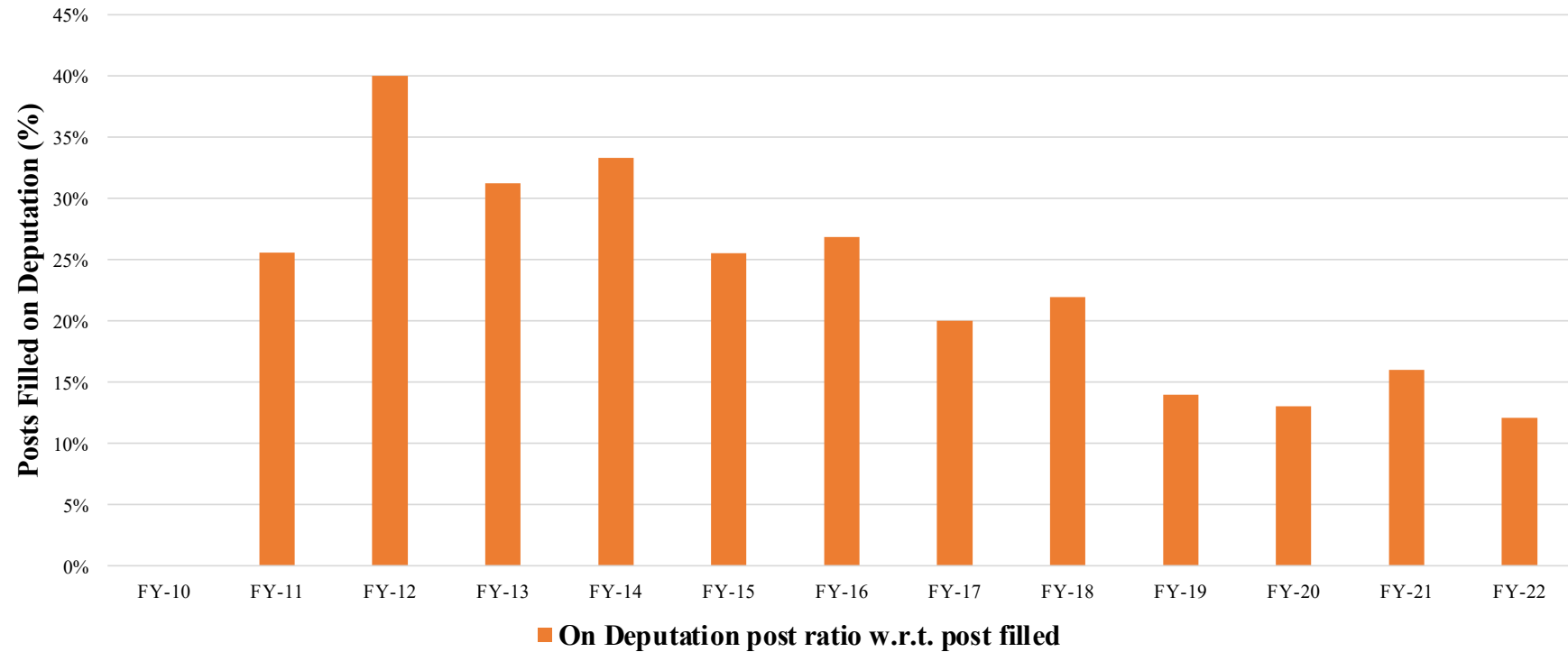
For FY-2014-15- (taken permanent as default), **Consultants (Legal)** for FY-2015-16, 2016-17, 2017-18

Deputy Director – Law - from FY to FY-17, **Joint Director – Law -** from FY-18 to FY-21.

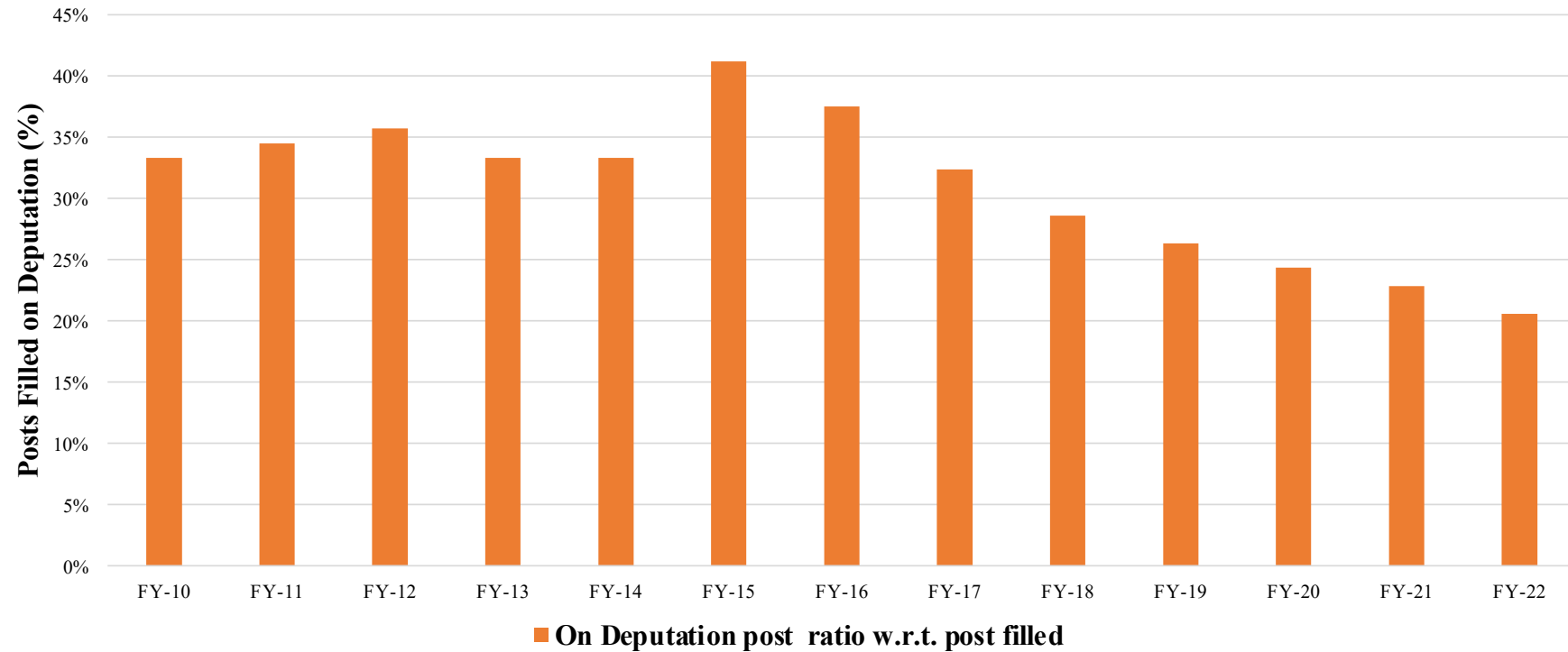
Post Filled on Deputation (%) w.r.t. Total post filled - WBERC



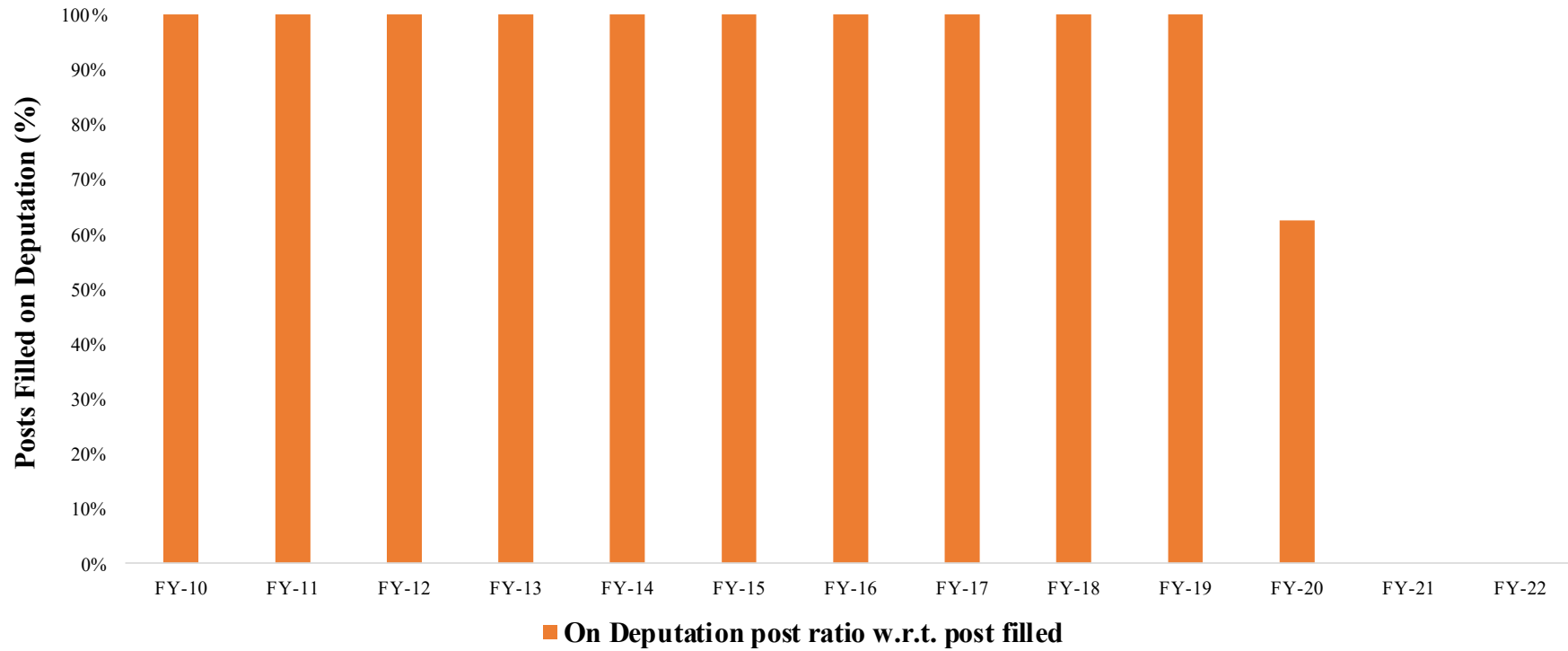
Post Filled on Deputation (%) w.r.t. Total post filled - KERC



Post Filled on Deputation (%) w.r.t. Total post filled - GERC



Post Filled on Deputation (%) w.r.t. Total post filled - TERC



Service Regulations in ERCs

ERC Name (Constituted Year)	Regulations & Subsequent Amendments	ERC Name (Constituted Year)	Regulations & Subsequent Amendments
APERC (1999)	1999, 2013, 2022	MPERC (1998)	2012, 2012
AERC (2001)	2006, 2017	MERC (1999)	2007, 2011
APSERC (2011)	2015, 2018	MSERC (2006)	2006
BERC (2002)	2014, 2015	NERC (2008)	2009, 2017
CSERC (2002)	2005, 2021	OERC (1996)	1997
DERC (1999)	2001, 2003, 2007	PSERC (1999)	2015
JERC (Goa & UTs) (2005, 2008)	2009	RERC (1999)	2005, 2012, 2012, 2013, 2014, 2019, 2020
GERC (1998)	2010	SSERC (2011)	2014, 2017, 2018
HERC (1998)	2007, 2011, 2018, 2022, 2022, 2022	TERC (2004)	2009, 2022 [Draft]
HPERC (2000)	2013, 2020, 2020, 2021	TNERC (1999)	
JSERC (2000)		TSERC (2014)	2022 (Amendment (Age) of Regulations 1999)
JERC (M&M) (2005)	2008, 2021	UPERC (1998)	2004, 2006, 2019
KERC (1999)	2000, 2018	UERC (2002)	
KSERC (2003)	2016, 2018	WBERC (1999)	2004, 2006

FOR (Framing Model Staff Regulations, Dec 2023)

- **The scope:** The objective of the report is to fulfill the basic need of enhancing staff strength and provide model framework for development of staff regulations for the ERCs while taking the references of SEBI, PFDR, etc.
- **Areas broadly discussed with certain Recommendations :**
 - a) Structure/ Format of Model Service Regulations - Staff Structure to be defined as in accordance with functional division, Model of SEBI's Staff service regulations.
 - b) Pay & Allowances - SERCs should adopt the pay and allowances as applicable to CERC employees which is to be in line with SEBI's pay scale, inter-regulatory commission transfer of manpower.
 - c) Medical Facilities - Similar to CERC and SEBI's circular.
 - d) Accommodation - HRA as applicable for SEBI/ Central Government employees.
 - e) Tour/ Visit Abroad - Allowed with the approval of the Chairperson of the ERC.
 - f) **Deputation & Promotion** - Deputation from ERCs/ Central Govt./ State Govt./ PSUs/ Autonomous organizations to be the primary mode of recruitment and from other educational institutions to be restricted.
 - g) **Absorption** - The provision for permanent absorption to be only at the entry-level with a minimum of two (2) years and Advance increments restricted to five (5).
 - h) **Training/ higher education** - ERCs may nominate officials to those programs which are conducted under any MoU by any ERC (national or international) as a part of an exchange program.
 - i) Leaves - Multivariate leaves such as - accident leave, sick leave, etc. were also added for special circumstances.

Regulatory Commissions - International Context

Regulatory Commissions	Country	Currency	Income (millions)		Expenditure (millions)		Budget	Employees	
			FY-21	FY-22	FY-21	FY-22		FY-21	FY-22
Ofgem	UK	GBP (£)	109.12	142.81	121.11	129.87		1,187	1,246
FERC	USA	USD (\$)	419.72	456.04	419.72	456.04	604.96		1,566*
EMA	Singapore	SGD(\$)	8.03	105.01	74.92	105.63		6,030	6,280
AER	Australia	AUD(\$)	267.32	293.10	274.44	306.19	298.04	1,172	1,201

Note: *As on September 1, 2023

<https://www.ferc.gov/sites/default/files/2023-09/FY%202024%20Commission%20Lapse%20in%20Appropriation%20Plan.pdf> (Pg. 5)

Sources:

Ofgem (UK) - https://www.ofgem.gov.uk/sites/default/files/2022-07/OFG2169%20Ofgem%20ARA%202022_Web.pdf (Pg. 87)

FERC (USA) - <https://www.ferc.gov/media/fy-2022-agency-financial-report> (Pg. 29)

Singapore (EMA) - <https://www.ema.gov.sg/content/dam/corporate/resources/corporate-publications/annual-reports/pdf-files/EMA-Annual-Report-Smart-Energy-Sustainable-Future-2021-2022.pdf> (Pg. 4)

Australia (AER) - <https://www.accc.gov.au/system/files/ACCC%20and%20AER%20annual%20report%202021-22.pdf> (Pg. 203)

Other Indian Regulatory Organisations

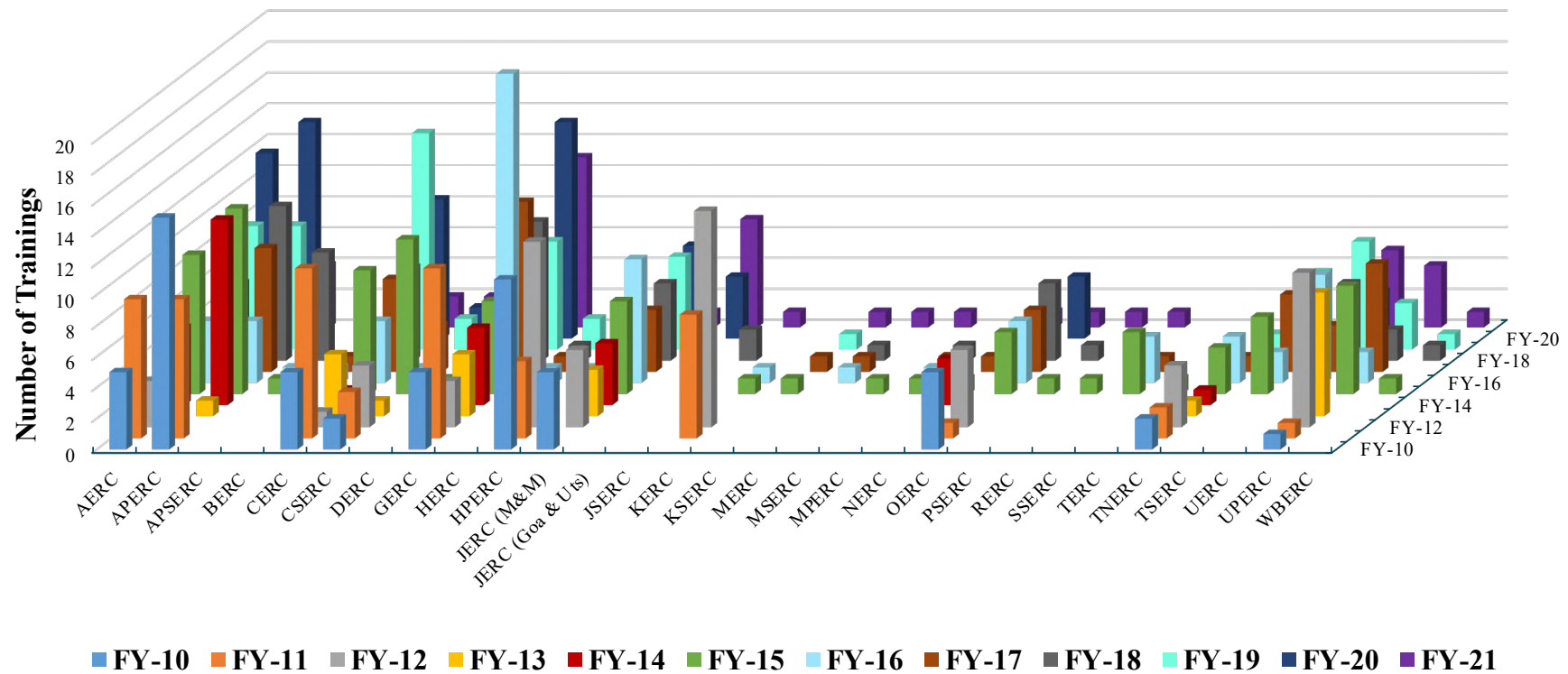
2020-21				2021-22			
Regulatory Organisations	Income (Rs. Crore)	Expenditure (Rs. Crore)	Employees	Regulatory Organisations	Income (Rs. Crore)	Expenditure (Rs. Crore)	Employees
SEBI	825.67	667.20	850	SEBI	1,236.84	749.43	980
AERA	10.367	10.44	21	AERA	15.77	15.02	21
TRAI	2.05	1.87	180	TRAI	2.22	2.18	186
PNGRB	50.06	25.97	44#	PNGRB	135.98	27.73	44#

Note: # - Employee sanctioned strength excluding chairperson, members and Secretary

Note: # - Employee sanctioned strength excluding chairperson, members and Secretary

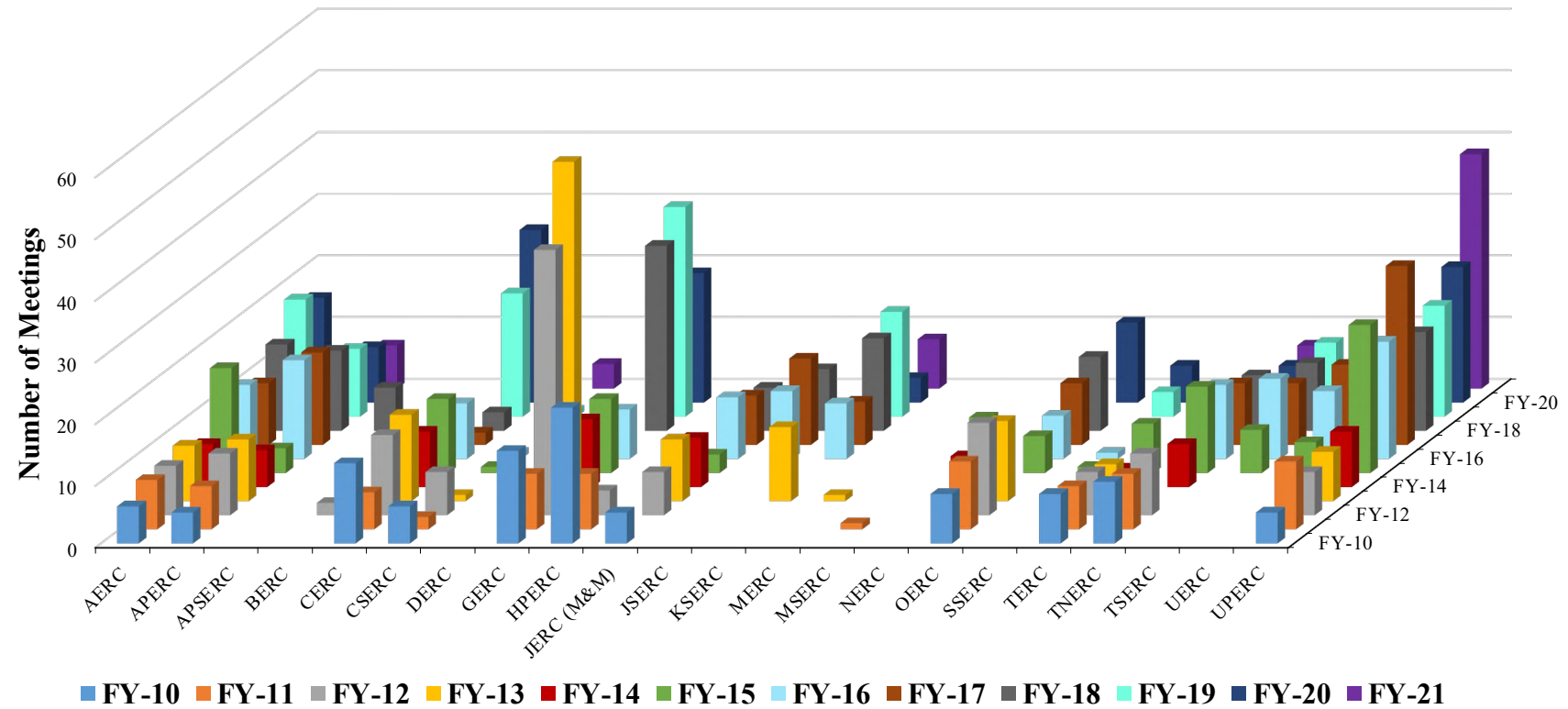
Capacity Building

Trainings Attended by Officers



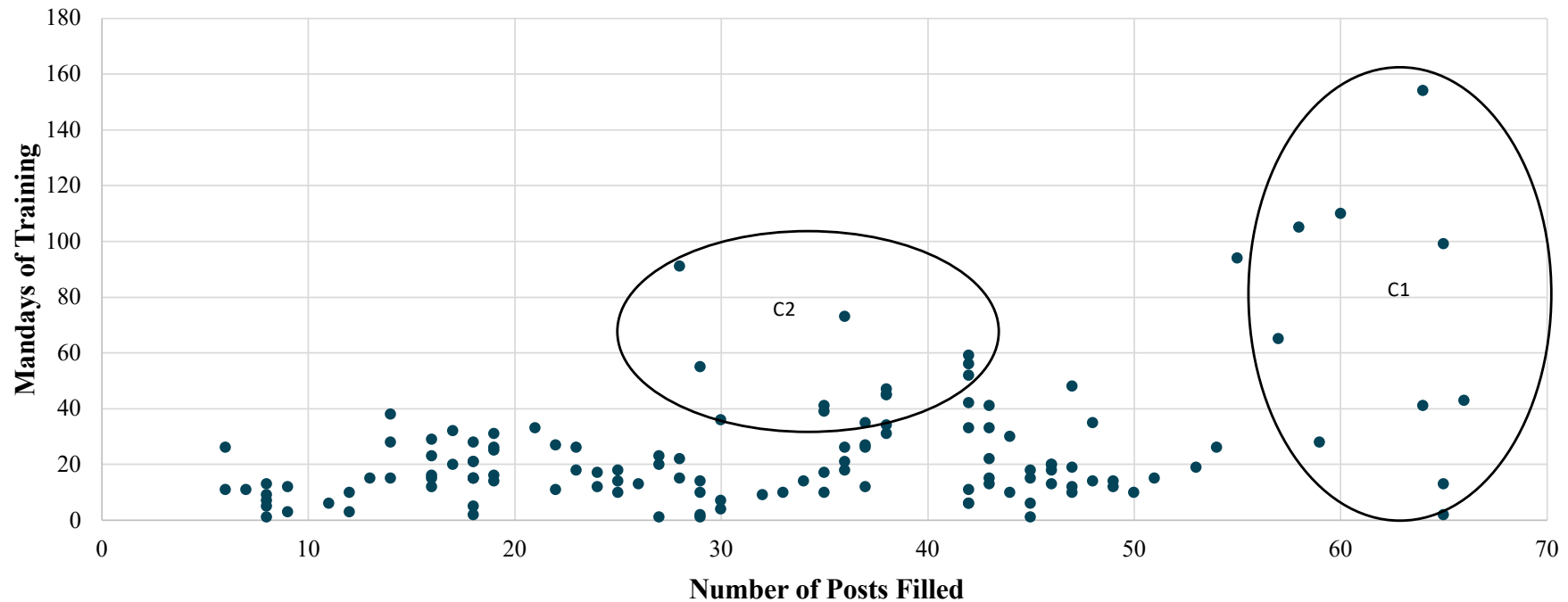
Note: Trainings includes Capacity Building Programs as well

Meetings Attended by Officers



Note: Meetings include - Meetings conducted by FOR, FOIR, SAFIR, Region Specific Forums(FORENS, SERF, etc.);
Conferences conducted by CII, IPPAI, APTEL, CIGRE, ASSOCHAM, FICCI and CERC as mentioned in annual report.

Posts Filled vs Man-days of Training



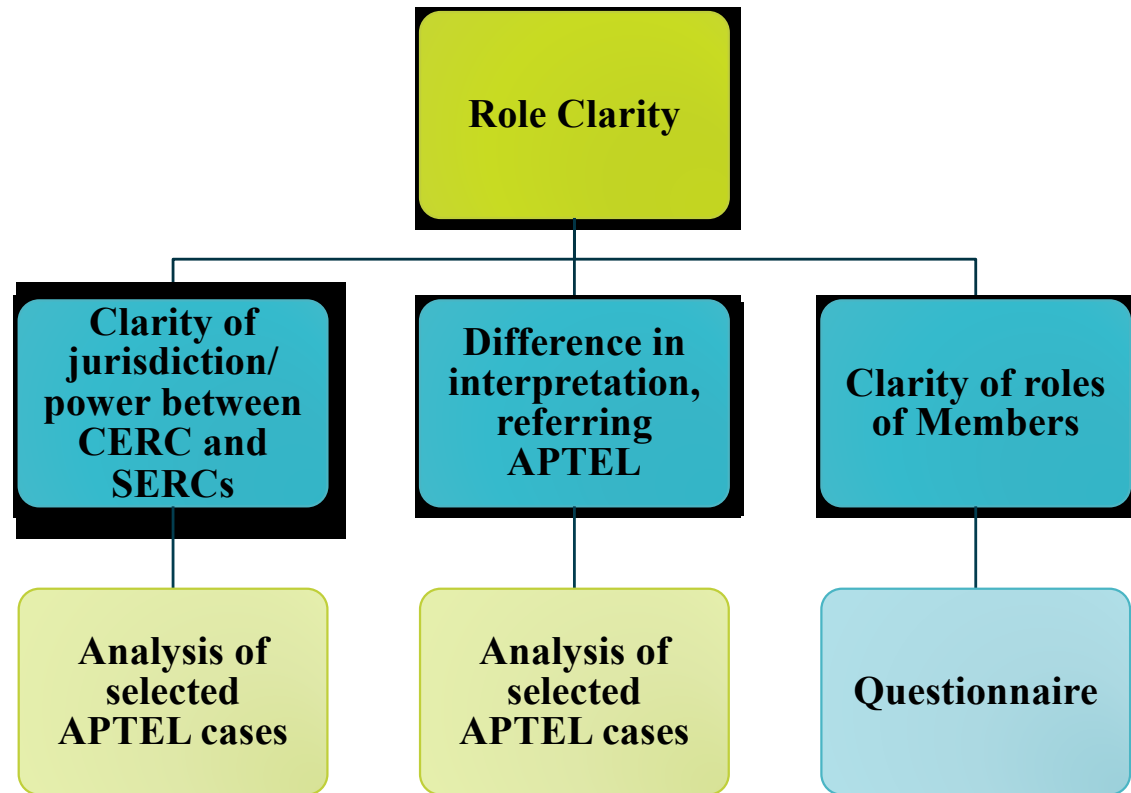
Note: State Represented by

C1: CERC (FY-10 to FY-20)

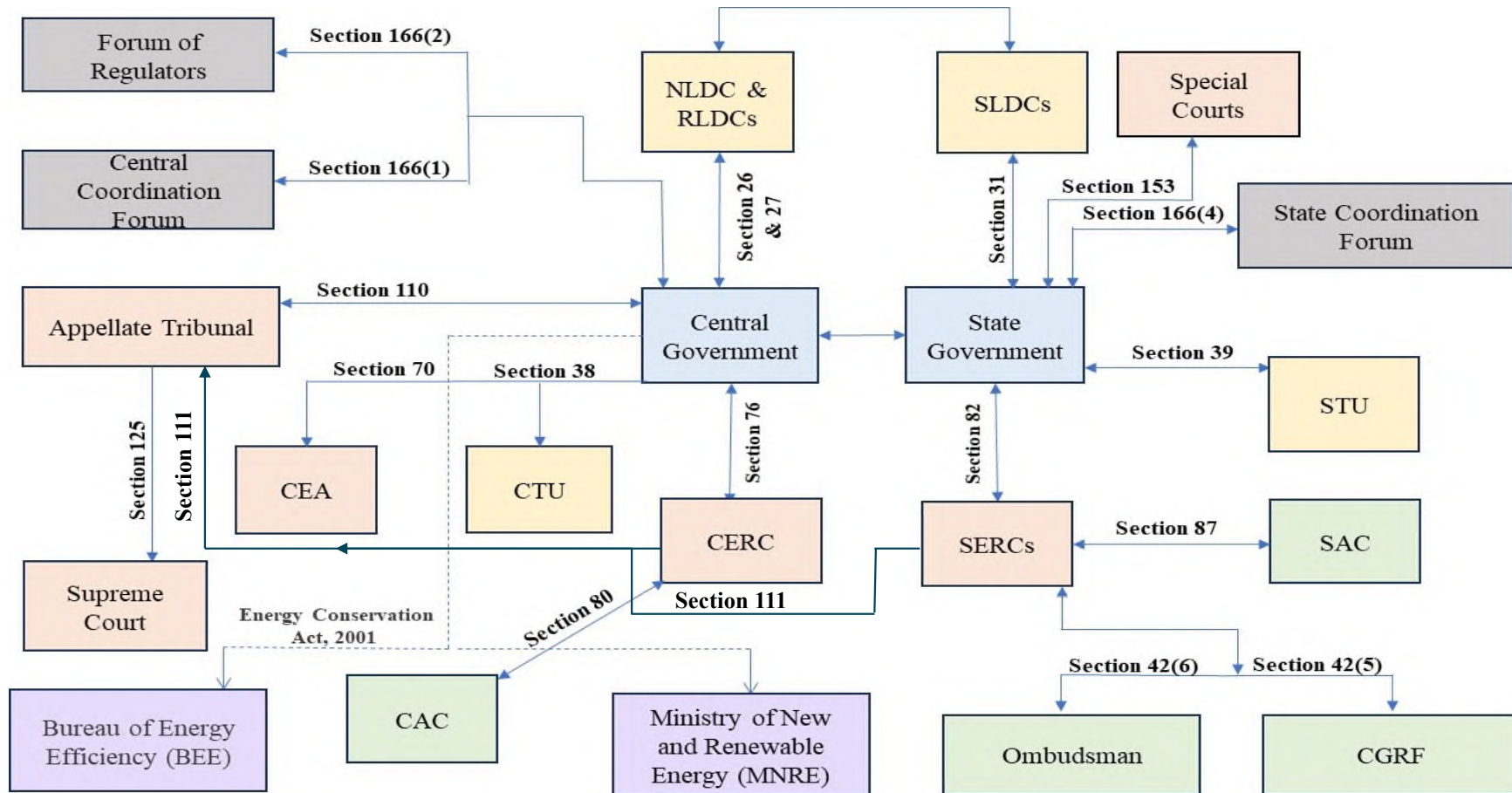
C2: OERC (FY-10, to FY-12, FY-18), GERC (FY-12, FY-13, FY-19), UPERC (FY-15 to FY-17, FY-21), HPERC (FY-10)

Role Clarity

Role Clarity



Institutional Governance Framework (Indian Power Sector)



Jurisdictional Issues

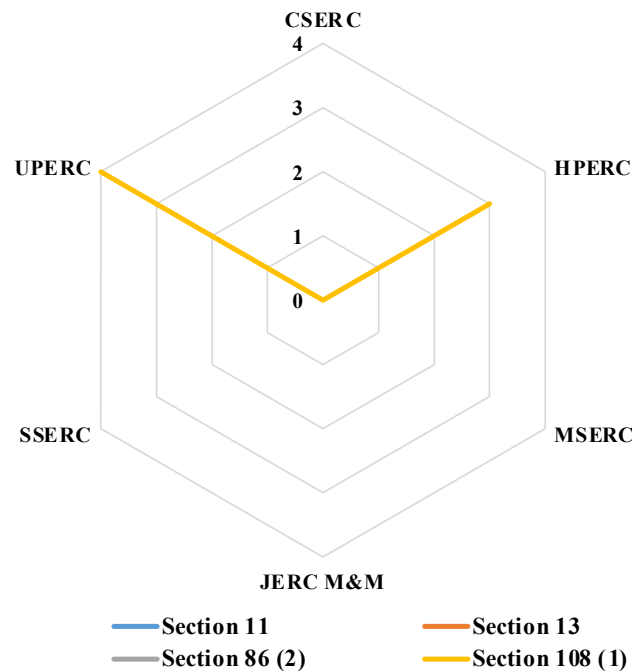
- In cases like **KSK Mahanadi Power Company Limited vs GERC**, the APTEL opined that the State Commission had erred in adjudicating the dispute between an inter-state Trader and a DISCOM even while the case was outside its jurisdiction as defined under Section 86(1) of the Act.
- In cases like **Solar Energy Corporation of India Limited vs DERC**, the State Commission had altered the trading margin (Inter-State) during adoption of tariff as discovered during the competitive bidding. It was held by APTEL that, it was beyond the jurisdiction of the State Commission.

So: CER, IIT Kanpur, “Policy research to identify interventions to reduce disputes in Power Sector”,
Submitted to Ministry of Power

Directions from Respective Government

Section 11: ERC may offset the adverse financial impact of the directions referred to in 11 (1) on any generating company in such manner as it considers appropriate.

Section 13: State Government can recommended exemption from provisions of Section 12 (grant of license) to the identified identities as per Section 13 related to transmission, distribution and trading.



Section 86 (2): ERC can advise the State Government on some matters related to promotion of competition, investment, re-organization and restructuring, etc.

Section 108 (1): State Government can guide and give in writing to an ERC in matters of policy involving public interest.

Directions to ERCs u/s 108(1)

HPERC

1. **Revaluation of Power Purchase:** Dated 02.07.2018, pertaining to the revaluation or fresh determination of tariff for power purchase and potentially other related issues.
2. **Deferment of Free Power Provision:** Dated 28.09.2018, concerning the postponement or deferment of providing free power for the initial 12 years, likely as a measure to manage financial obligations or resources.
3. **Waiver of Intra-State Transmission Charges for Solar Power Developers:** Dated 11.10.2022, involving the state government recommending the waiver of 50% of intra-State transmission charges or similar fees for solar power developers, potentially as an incentive to promote solar energy generation.

UPERC

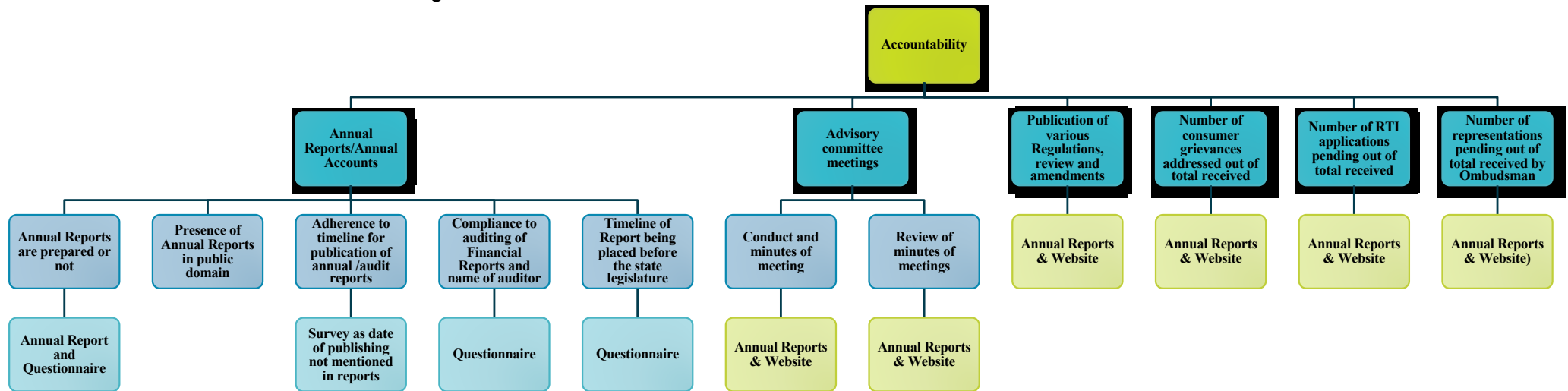
1. **Informing Commission about Subsidy Rates - Ongoing Review:** The Uttar Pradesh Government informs the Commission about subsidy rates, subject to finalization pending non-subsidized tariff assessment. A transparent subsidy transfer plan for 2021-22, effective from April 01, 2022, was approved.
2. **Reduction of Electricity Rates for Rural Tube Well Consumers:** UP Govt. directs Commission to provide subsidy for the metered/ un-metered connection in rural areas.
3. **Directive regarding the Tariff Determination of Electricity Consumers and Government Aid:** The UP Govt. informed the UPERC regarding the consumer category/sub category/ slab wise government aid amount and per unit rates. It was also informed that finalisation of the subsidy under the UP Government assigned consumer category could be calculated only after the calculation of the non-subsidized tariff.
4. **Direction for Classification of Sub-Tariff Categories:** UPERC schedules a meeting chaired by Additional Chief Secretary, Energy Dept., on 21.06.2021 in his office at Building, following government letter no. 1330/24-P-3-2021-9/2014 dated 16:06 2021. This meeting will address the direction to the UPERC for the classification of sub-tariff categories under LMV-2 or LMV-6.

Accountability

Accountability to the Stakeholders

- Accountability to the Legislature
 - ➔ • Annual Report and Accounts
- Accountability to the Society & Consumers
 - ➔ • SAC, Public Consultation, RTI, Ombudsman
- Accountability to the Regulated Entities
 - ➔ • Disposal of Petitions

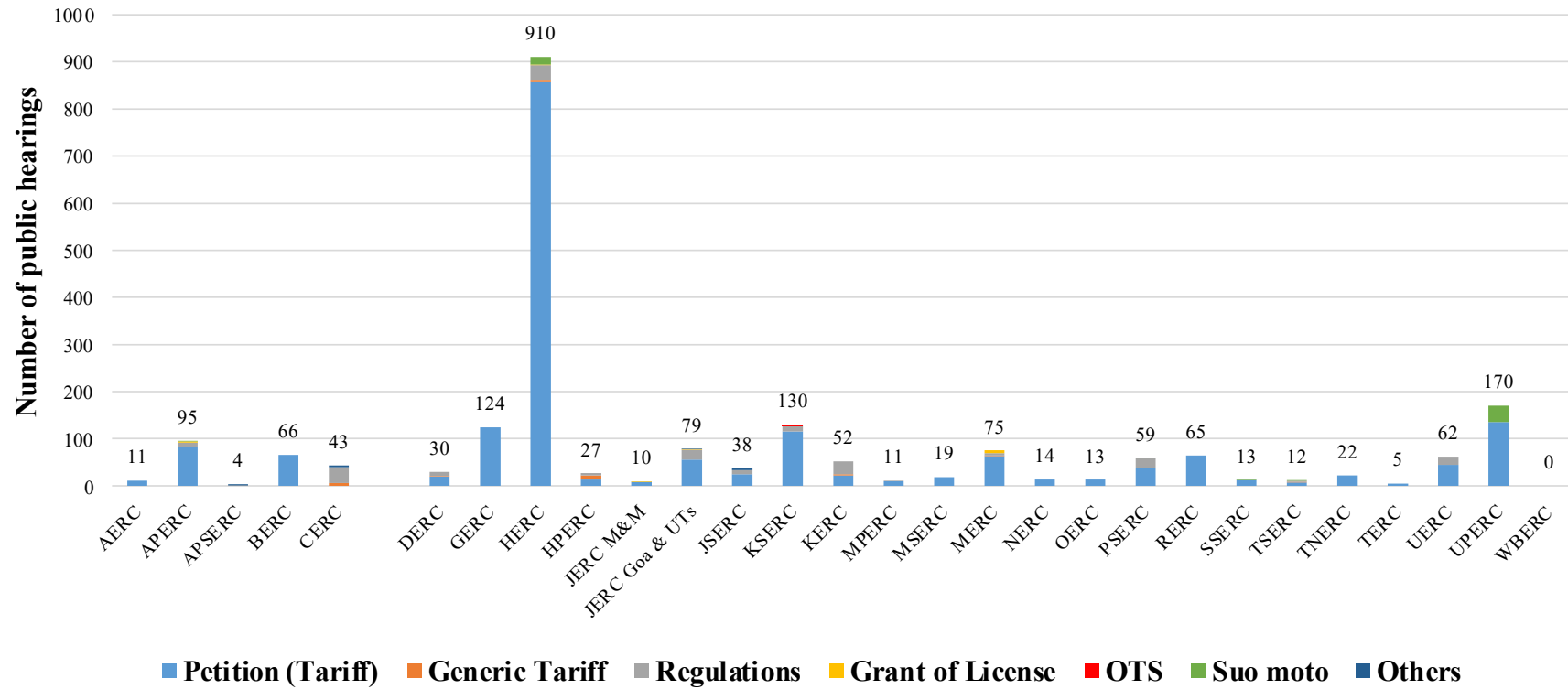
Accountability



Accountability

- Accountability emphasises on the responsibility and transparency of ERCs towards its stakeholders (legislature, regulated entities, consumers, etc.).
- Effective regulation not only requires an overview of performance of their functions but also updates of achievement of their objectives.
- Points taken under analysis broadly includes-
 - a. Engagement with Stakeholders
 - b. Timeline of publishing of annual reports
 - c. RTI information availability
 - d. Redressal of public grievances
 - e. Consistency in conducting SAC meetings
 - f. Disposal of Petitions

Public Hearings on Various Subjects (FY-10 to FY-21)



Central/ State Advisory Committee

Functional Aspects of Central/State Advisory Committee

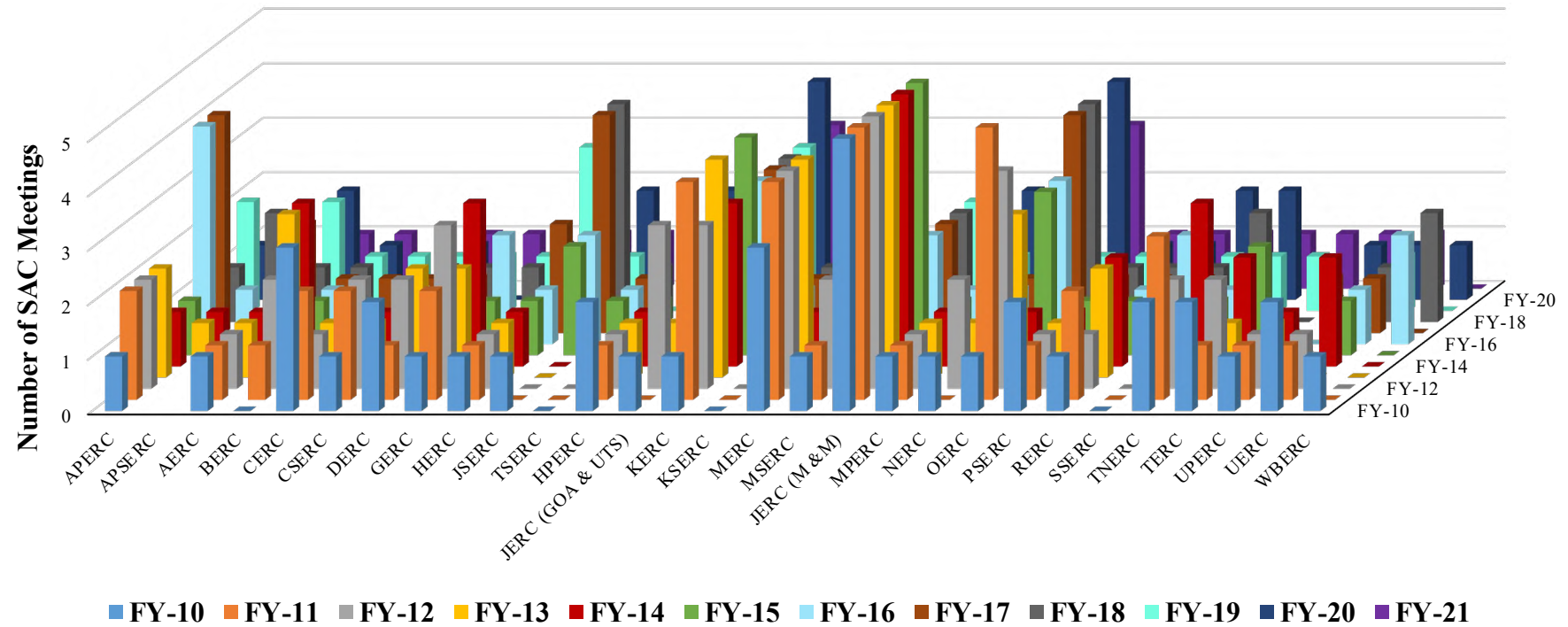
Composition

Meetings

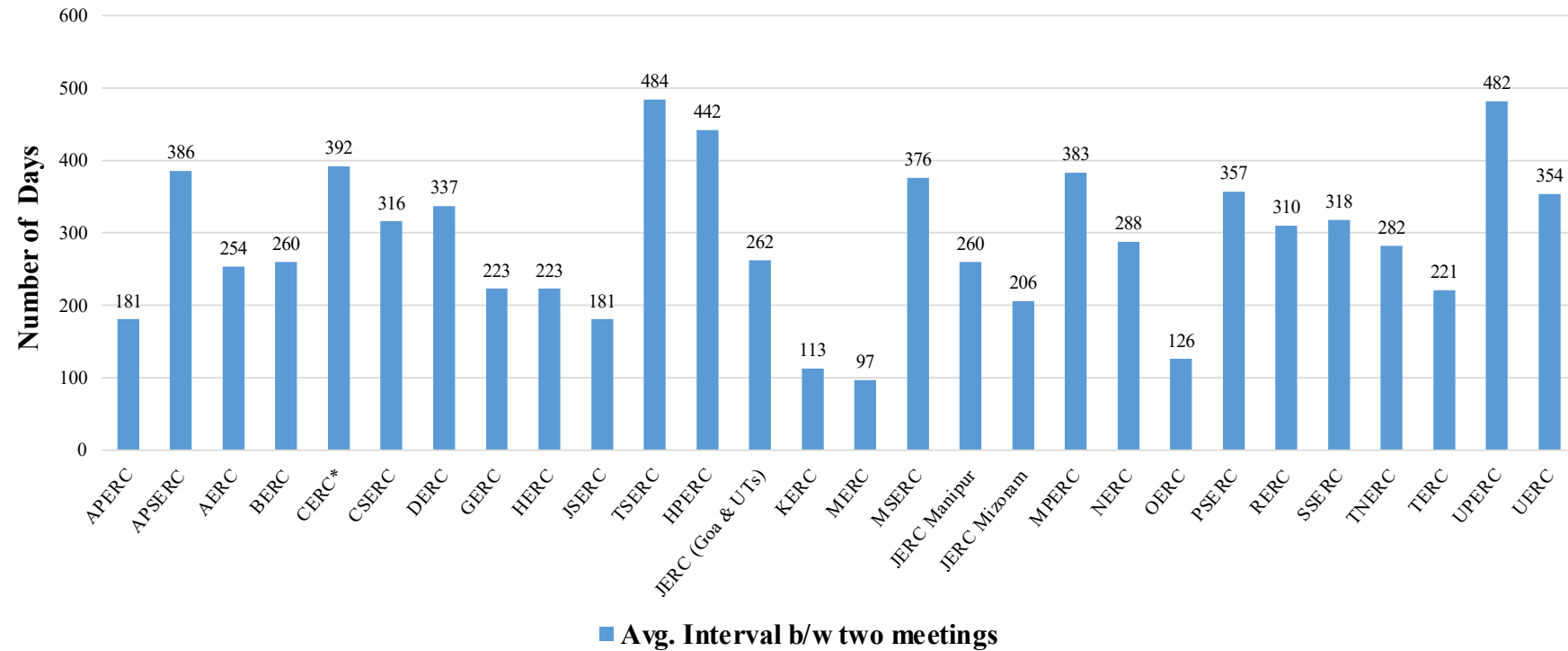
Agenda

Timeliness of Meeting

Total Number of SAC Meetings



Overall Average Interval b/w two SAC Meetings



Note: *Central Advisory Committee (CAC) for CERC.

Annual Report

Availability of Annual Reports (FY-10 to FY-22)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
CERC													
APERC													
APSERC		NA											
AERC													
BERC		NA											
CSERC													
DERC													
GERC													
HERC													
HPERC													
JSERC													
KERC													
KSERC													
MPERC													
MERC													
JERC M&M													
MSERC													
NERC		NA											
OERC													
PSERC													
RERC													
SSERC		NA											
TNERC													
TSERC			NA										
TERC													
UERC													
UPERC													
WBERC													
JERC Goa & UT													
	Annual Reports are available on the website								Combined Annual Reports are available on the website				
	Annual Reports received through email								NA/Not Established				
	Annual Reports not available on the website (and not received on email)												

Coverage of Annual Reports across ERCs

1	About the Commission / Profile of the Chairperson and Members of the Commission	12	Legal Matters
2	Power Scenario - An overview / Licences, Investment Approvals, etc.	13	Tariffs
3	Mission Statement	14	Public Hearing
4	Activities during the year/ Petitions Disposed of during the Year / Regulations/ Notifications and Approved Documents	15	Right to Information
5	Outcome of Regulatory Process in terms of benefit to consumers and development of the sector	16	State Advisory Committee
6	Major Concerns before the Commission to address	17	Annexures to the report
7	Organisational Setup & Administration / Existing Manpower	18	Subsidy programmes, including the allocations and the beneficiaries
8	Meetings/ Conferences/ Training	19	Recipients of concessions, permits or authorizations granted
9	Functioning of CGRFs and Ombudsman	20	Categories of documents held by the Commission or under its control incl. in electronic form
10	Proposed Activities for FY 2021-22.	21	Facilities available to citizens for obtaining information, including library or reading room, if maintained, for public use
11	Annual Accounts		

Contents of Annual Report

	AERC	APERC	APERC	BERC	CERC	CSERC	DERC	GERC	HERC	HPERC	JERC M&M	JERC Goa & UT	JSERC	KERC	KSERC	MERC	MSERC	MPERC	NERC	OERC	RERC	SSERC	TNERC	TSERC	TERC	UERC	UPERC	WBERC
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	Content Available
	Content Not Available

Note: PSERC annual report N.A., DERC only revenue receipts available in AR and no other information regarding financial accounts available.
List of Contents in Annexure 1

Recommendations – Annual Report

- **Standardised format for Annual Report and Annual Accounts**
- **Timeline for Preparation of Annual Report and Annual Accounts**
- **Status of Annual Report**
 - Under preparation
 - Tabled in the legislature
 - Published
- **Status of Annual Accounts**
 - Under preparation
 - Audited
 - Tabled in the legislature
 - Published
- **Language**
 - English and,
 - local official language
- **Format**
 - In case of signed/scanned copy being uploaded, a Pdf/doc version

Focus areas for Strengthening Regulatory Governance

Capacity

- Enhancement of sanctioned strengthen of the ERCs
- Periodic Assessment of Capacity and Capacity Building Needs of ERCs

Accountability

- Timely preparation and dissemination of the Annual Report and Annual Accounts
- Standardised and expanded format for Annual Report
- Standardised format for Financial Statement of Accounts
- Accountability towards consumers – information disclosures

Regulatory Impact Assessment (RIA)

- Statement of Reasons
- Objective and Final impact on consumers – Regulations and Orders
- Mapping of objectives and achievements thereof through periodic assessments

Independence

- Reduce dependence on deputation
- Cadre for Regulatory Officials

Way Forward

Urgent need for data sharing for the analysis

Assessment of Gaps

Discussion with Stakeholders

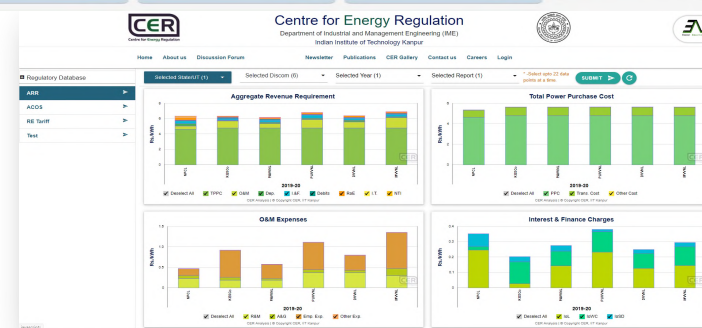
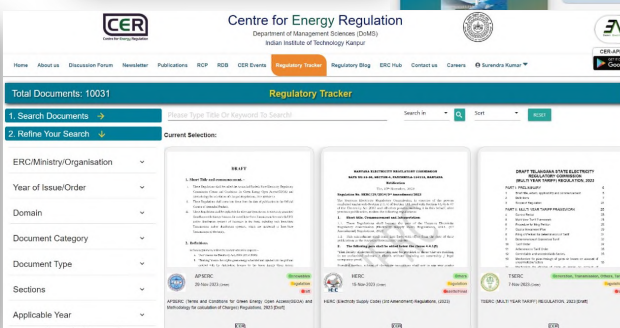
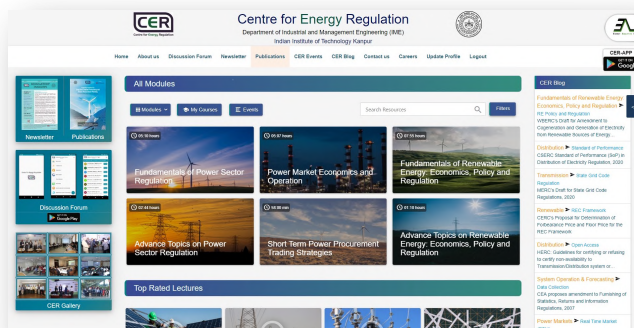
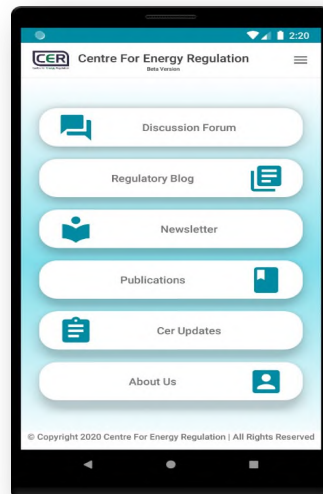
Enhancing Transparency and Accountability

Working Group of FoR

National and International Consultations

Begin talking about it.....

Centre for Energy Regulation – Contributions to Regulatory and Policymaking Process



Thank You



PhD

M.Tech.

PGP VLM

eMasters