MINUTES OF THE 89th MEETING OF THE FORUM OF REGULATORS (FOR)

Venue	**: Konark, Odisha (Hybrid Mode)**
Date /Day	**: 17.01.2024, Wednesday**
Time	**: 10 AM**
List of participants	**: Annexure-I**

At the outset, the Chairperson, Odisha ERC (OERC), extended a warm welcome to all the Members of FOR to Konark, Odisha. He thereafter gave an overview of recent developments in the power sector in Odisha and emphasized the role of Odisha as one of the hubs for the production of green hydrogen and green ammonia within the country in the near future. He added that Odisha is among the few SERCs to have notified the Green Energy Open Access Regulations, which allow the banking of green energy. He informed the Forum that the peak demand of the State is around 6000 MW with an energy requirement of about 32000 MU. Odisha also has a robust transmission network of about 16270 ckt km and a distribution network of 4 lakh ckt km, which caters to a consumer base of about 1 crore.

2. Thereafter, the Chairperson, CERC/FOR welcomed the members to the 89th FOR meeting. He acknowledged the efforts of Shri Suresh Mahapatra, Former Chairperson of Odisha ERC, and conveyed appreciation to Shri Gajendra Mahapatra, Chairperson in charge of OERC and the host for this FOR meeting. Reflecting on the 88th FOR meeting in Mussoorie, he referred to the formation of a dedicated Working Group to delve into the critical matter of the long-term sustainability and viability of DISCOMs. He expressed gratitude for the enduring commitment of the members of the FOR towards addressing the critical challenges and fostering sustainable growth within the power sector.

3. Giving a brief about Odisha's Power sector, he underscored the pivotal role that Odisha plays in shaping the eastern region's power sector. He highlighted that Odisha has made a substantial contribution to installed capacity and renewable energy, accounting for approximately 42% of the total renewable energy installed capacity in the eastern region.

4. The Chairperson FOR / CERC also informed the Forum that Shri D.P. Gairola, Chairperson in charge, UERC and Shri I.S.Jha, Member, CERC would be demitting office shortly and expressed heartfelt appreciation for their proactive engagement and insightful contributions to the Forum and extended best wishes for their future endeavours. He also lauded Shri Mahapatra and his team for their unwavering dedication to making the meeting a success.

5. Thereafter, the Forum took up the agenda items of the meeting for discussion.

AGENDA ITEM 1: CONFIRMATION OF:

a) MINUTES OF THE 88TH FOR MEETING HELD ON 13TH OCTOBER 2023

6. Dy Chief (RA), CERC apprised the Forum on the action taken on the decisions in the 88th FOR meeting after which the Forum confirmed the minutes of the 88th FOR meeting.

b) SPECIAL FOR MEETING HELD ON 15TH DECEMBER 2023

7. Dy Chief (RA), CERC, briefed the Forum on the action taken points on the minutes of the Special meeting of FOR held on December 15, 2023. Regarding the agenda item on the Global regulatory perspectives program for Chairpersons of SERCs, the Forum was informed that in line with the decision of the FOR in the previous meeting, FOR Secretariat has approached IICA (An autonomous Institute under the Ministry of Corporate Affairs) for a proposal to conduct the said program as they are the knowledge partner of the Forum of Indian Regulators (FOIR) and that they have been conducting various capacity building programs for FOIR.

8. After the discussion, the FOR ratified the decision to approach IICA for conducting the above said program during April and May 2024, with a budget of Rs. 2 Crore and travel as per entitlement class (business). Group booking should be the preferred mode for economizing costs, with an option for individual booking subject to a ceiling of Rs. 1.5 lakhs and flexibility in return journey date.

9. With the above decisions, the minutes of the special FOR meeting were confirmed.

AGENDA ITEM 2: PROCEDURE FOR IMPLEMENTATION OF UNIFORM RENEWABLE ENERGY TARIFF – REFERENCE FROM UPERC

10. A reference was received from UPERC in regard to the Electricity (Amendment) Rules 2022, wherein an Implementing Agency is tasked with computing the 'uniform renewable energy tariff' on a monthly basis for each category of the central pool. Subsequently, MoP vide its order dated 17.03.2023, has notified Grid Controller of India Ltd as the Implementing Agency. UPERC had requested for a presentation from the Grid Controller of India Ltd regarding the notified procedure for the implementation of the Uniform Renewable Energy Tariff (URET).

11. Accordingly, the representatives from Grid India made a presentation **(Annexure – II)** on the concept of URET and the procedure for its implementation. They informed the Forum that while the procedure prepared by Grid India has been approved by MoP on 25.10.2023, MoP is yet to notify the start date of each category of the Pool and the intermediary procurer. The presentation covered topics on timelines to be followed by various agencies, data flow (Monthly) for calculation of URET, eligibility conditions of generator/producer/ end procurer/ intermediary procurer, registration and computation of tariff. It was also informed that the end procurer is mandated to obtain approval from the respective State Commissions before procuring power from the pool at URET. It was further informed that the tariff computed for a month will be the weighted average of the tariffs of all the generators which are part of the Pool during that month.

12. The Forum deliberated on the scheme and observed that the intermediary agency could be SECI or NVVNL (to be notified by MoP), who shall be procuring renewable (RE)power on behalf of the Discoms. Hence, Discoms are required first to obtain approval from State Commissions for procuring renewable (RE) power from the Central Pool at URET. Following approval, they shall request the intermediary agency to procure RE power. Theintermediary agency will invite bids for selecting the RE generators through the competitive bidding process and thereafter sign individual PPA which requires approval of the Appropriate Commission. Subsequently, the PSA will be signed between the intermediary agency and

Discoms at a dynamic tariff, which shall be computed by Grid India every month. There was a general understanding that tariffs for renewable sources may be reduced further in the future, and as new generators will get added to the Central Pool, the URET, being the weighted average of tariffs of all generators, shall gradually reduce.

13. Following a detailed discussion, the members of the Forum made a note of it for suitable action at their end. It was also decided that this matter may be referred to the FOR Working Group on RE Policy for further deliberations.

AGENDA ITEM 3: FOR STUDY ON "CEILING TARIFF FOR THE DISTRIBUTION SECTOR"

14. The FOR, in its 74th meeting held on 9th April 2021 had approved the proposal for conducting a study on Ceiling Tariff for Distribution Sector in India. For carrying out the study, the FOR Secretariat engaged corporate consultant M/s.Deloitte. The study report has been finalized in consultation with FOR.

15. Subsequently, the Consultant made a presentation **(Annexure – III**) detailing the study, the key findings and recommendations made under the study. After detailed deliberation, the FOR made the following suggestions for updating the report:

i. Ceiling tariff may be relevant for areas with multiple parallel licensees in the same area of supply.
ii. The ceiling tariff should be so designed to ensure it does not lead to an under-recovery, significant loss for the incumbent licensee and undue profits for the efficient licensees.
iii. A benchmark power purchase cost should be determined based on market data analysis for the purpose of ceiling tariff with a trajectory for the incumbent licensee to improve to keep its power purchase cost below this benchmark.
iv. The treatment of existing PPAs, cross-subsidy, and technical and commercial loss be explained in greater detail.

16. The FOR adopted the study report as a possible model, subject to the incorporation of the above-indicated suggestions. The FOR also decided that the model indicated under the study shall be suggestive in nature and that the State Commissions shall have the flexibility to refine the suggested model based on the conditions prevailing in their respective States.

AGENDA ITEM 4: PRELIMINARY REPORT OF FOR WG ON RE POLICY

17. The Forum was apprised of the Working Group (WG) constituted to address various emerging issues of Renewable Energy related to Policy and Regulatory matters. In this context, a Preliminary Report was prepared based on the deliberations in three meetings of the WG covering two key issues, namely, Banking of Green Energy and Green Energy Tariffs. The consultant assisting the WG presented the Preliminary Report highlighting the recommendations of the WG related to the two issues (**Annexure – IV).**

18. After discussion, the Forum made the following recommendations:

i. The energy banked during the off-peak period shall be permitted to be drawn back during the off-peak period by paying the banking charges in kind as 8%. However, if the same arrangement is allowed for off-peak to peak period banking, it would create a financial burden on DISCOMs and would hinder the development of energy storage as the consumers will opt to use the grid as a storage system.

ii. Inter-state wheeling/banking of RE power may not be feasible as it is not aligned with a regional framework for energy and deviation accounting and commercial settlement of inter-state transactions, which are based on a 15-minute time-block with weekly settlement cycles.

iii. Green Energy Open Access (GEOA) consumers are to be permitted to bank up to a maximum of thirty per cent of the total monthly consumption of electricity from the green energy source in a banking cycle.

iv. The recommendation of the WG that the Green Energy tariff should be determined as per formulation and methodology adopted by MPERC for determination of various components of the Green Energy Tariff, stipulated under GEOA Rules, was agreed upon. The Forum also recommended that such a Green Energy Tariff should not be lower than the Average Billing Rate for the respective consumer category.

It was also suggested that FOR may propose to MoP to incorporate the above recommendations in the GEOA Rules through suitable amendments.

19. The Forum also decided that as the number of issues to be discussed remains, the same may be continued in the next meeting of the FOR

ANY OTHER AGENDA ITEM AND CONCLUSION

20. The Forum felicitated Shri D.P. Gairola, Chairperson in charge UERC, as he would be demitting office before the next full FOR meeting. Shri D.P.Gairola, Chairperson in charge, UERC, thanked the Forum for the enriching discussion in all its meetings. He stated that he had a lot to learn from such meetings.

21. The Forum also felicitated Shri I S Jha, Member, CERC / FOR Secretariat, as he would also be demitting office shortly. Shri I S Jha thanked the Forum for acknowledging his contribution to the Forum, stating that the meetings of the Forum were highly enriching. He also had an opportunity to head the FOR Standing Technical Committee and the FOR WG on Resource adequacy, which has made important recommendations for the sector. He expressed his gratitude to the Forum for the opportunities given to him.

VOTE OF THANKS

22. At the end of the meeting, the Secretary, CERC/FOR expressed gratitude to the distinguished Chairpersons, Members, Working Groups, Consultants, and Grid-India for the engrossing session and their valuable contributions to the meeting. He also extended sincere appreciation to Shri Suresh Mahapatra, former Chairperson of OERC and Shri Gajendra Mahapatra, Chairperson-in charge, OERC for the wonderful arrangements and warm hospitality and to the entire team of OERC for organizing a memorable meeting. He also thanked the FOR secretariat for their dedicated efforts.

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

*****

/ ANNEXURE – I /

LIST OF PARTICIPANTS OF THE

89TH FORUM OF REGULATORS ("FOR") MEETING

HELD ON WEDNESDAY, 17TH JANUARY, 2024.

AT KONARK (ODISHA)

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.	Justice (Shri) Amitav Kumar Gupta Chairperson	JSERC
06.	Shri Alok Tandon Chairperson	JERC for State of Goa & UTs
07.	Shri Lokesh Dutt Jha Chairperson	JERC for UTs of J&K and Ladakh
08.	Shri Rengthanvela Thanga Chairperson	JERC for M & M
09.	Shri P. Ravi Kumar Chairperson	KERC
10.	Shri S.P.S. Parihar Chairperson	MPERC
11.	Shri Sanjay Kumar Chairperson	MERC
12.	Shri P.W. Ingty Chairperson	MSERC
13.	Shri Viswajeet Khanna Chairperson	PSERC
14.	Dr. B.N. Sharma Chairperson	RERC
15.	Shri K.B. Kunwar Chairperson	SSERC
16.	Shri M. Chandrasekar Chairperson	TNERC
17.	Shri T. Sriranga Rao Chairperson	TSERC
18.	Shri D. Radhakrishna Chairperson	TERC

19.	Shri Arvind Kumar Chairperson	UPERC
20.	Dr. M.V. Rao Chairperson	WBERC
21.	Shri Gajendra Mohapatra Chairperson Incharge	OERC
22.	Shri D.P. Gairola Chairperson Incharge	UERC
23.	Shri Thakur Rama Singh Member	APERC
24.	Shri Parshuram Singh Yadav Member	BERC
25.	Shri Mehul M. Gandhi Member	GERC
26.	Shri Naresh Sardana Member	HERC
27.	Shri A.J. Wilson Member	KSERC
28.	Shri Harpreet Singh Pruthi Secretary	CERC/FOR
29.	Dr. Sushanta Kumar Chatterjee Chief (Regulatory Affairs)	CERC
SPECIAL INVITEES		
ERC		
30.	Shri I.S. Jha Member	CERC
31.	Shri Pravas Kumar Singh Member	CERC
FOR SECRETARIAT		
32.	Ms. Rashmi Somasekharan Nair Dy. Chief (RA)	CERC
OTHERS / GUESTS		
33.	Shri S.S. Barpanda Director (Mkt. Operations) – online	Grid Controller of India
34.	Shri Manoj Kumar Agrawal, Executive Director (SP&M, ET&S and Contracts) – online	Grid Controller of India
35.	Shri Ajit Pandit	Idam Infra-USAID-SAREP
36.	Shri Rajat Goel	Deloitte
37.	Shri Pankaj Kumar Goinka	Deloitte

MINUTES OF THE 88TH MEETING OF THE FORUM OF REGULATORS (FOR)

Venue: Mussoorie, Uttarakhand

Date: 13th October, 2023 (Friday)

Time: 10:00 hrs

List of participants: Annexure-I

Chairperson, Uttarakhand ERC (UERC) welcomed the Chairperson, FOR/CERC and the Chairpersons / Members of all the State and Joint Commissions for joining the 88th FOR meeting being hosted by UERC. In his welcome remarks, the Chairperson, Uttarakhand ERC appreciated the role being played by the Forum of Regulators as a crucial platform for power sector regulators to converge, collaborate, and enhance the sustainability and regulation of the power industry. Giving a brief overview of the Uttarakhand power sector, he informed that the Uttarakhand power sector comprises predominantly hydro generators with State-owned generating companies having installed hydro capacity of 1420 MW and private gas-based power plants supplying 321 MW. Besides, around 600 MW of solar power plants have been installed in the State. During different seasons, the State faces varying power demands, with reliance on state generating stations, allocations from the central sector generating stations, and short-term purchases including through traders, power exchange, market, etc. to meet these demands. During winter, due to reduced hydro generation in the State, there is greater dependence on short-term purchases to meet the deficit. He added that the transmission system in the State is managed by PTCUL, while distribution and retail supply are handled by UPCL, the sole distribution licensee serving approx. 28.5 lacs consumers in the State. On the consumer empowerment front, there are a total of 9 CGRFs spanning across the State.

2. Thereafter, the Chairperson, FOR/ CERC extended a warm welcome to all the members and thanked the Chairperson, Uttarakhand ERC (UERC) for hosting the meeting. He highlighted the past accomplishments of the Forum in addressing challenges within the power sector and its role in the harmonious and holistic development of the power sector. Reflecting on the 87th FOR meeting in Tripura held in August 2023, he referred to the deliberations held and lauded the active participation and efforts of the members on the way forward for meeting the challenges faced by the Commissions and the power sector as a whole.

3. The Chairperson FOR / CERC also informed the Forum that Uttarakhand is blessed with huge hydro potential. Notedly, the State does not have any coal, diesel or nuclear-based

generation. Uttarakhand also holds significant untapped potential for small hydropower generation. He applauded UERC's commendable effort towards the development of the sector. He also took the opportunity to acknowledge the role and contribution of Shri R.K. Pachnanda, Chairperson, HERC, who will be demitting office soon, for his contribution to the functioning of the Forum and wished him every luck in all his future endeavours. He also thanked the Chairperson, UERC for his enthusiasm and tireless effort along with his team for hosting the event.

Subsequently, the agenda items were taken up for discussion.

AGENDA ITEM. NO. 1: CONFIRMATION OF THE MINUTES OF THE 87TH FOR MEETING HELD ON 25th AUGUST 2023

4. Dy Chief (RA), CERC apprised the Forum of the discussions of the 87th FOR meeting and action taken points of the said minutes. After deliberations, the Forum unanimously approved the minutes of the 87th FOR meeting.

AGENDA ITEM NO. 2: REFRENCES FROM HPERC

A) FIXATION OF TRAJECTORY BY THE STATE ELECTRICITY REGULATORY COMMISSION (SERCS) OF THE DISCOMS FOR LOSSES REDUCTION ON THE BASIS OF AT&C AND AS AGREED BY DISCOMS WITH GOI AS PRESCRIBED IN THE ELECTRICITY (SECOND AMENDMENT) RULES, 2023.

5. The Forum was apprised of the reference from Himachal Pradesh ERC about the implementation of the rules issued by the Ministry of Power (MOP) regarding the approval of Aggregate Technical and Commercial (AT&C) losses. According to the Rules, State Commissions are supposed to approve AT&C loss figures based on agreements between State and central governments in national schemes. However, HPERC has stated that there are some implementation issues in this context.

6. Chairperson, HPERC informed that MOP's rules mandate the use of AT&C loss figures for fixing loss reduction trajectory, but since these figures are as suggested by the Discoms,

often ignore the efficiency improvement target set by the regulations. Also, with the introduction of the Revamped Distribution Strengthening Scheme (RDSS), AT&C losses have been reported to be increasing in Himachal Pradesh which earlier had a decreasing trend. The trajectory given by the Government of India was already achieved by the State. Further, in Himachal Pradesh, AT&C losses are low due to nearly 100% metering and efficient bill collection, with exceptions like delayed payments by government bodies. Hence, the government's direction to SERCs to follow the Discom-provided trajectory for AT&C losses may need to be reviewed.

7. Chairpersons of JERC (Goa & UTs), Madhya Pradesh, Uttarakhand and Uttar Pradesh ERC also expressed similar concerns.

8. After detailed deliberation, the Forum decided that SERCs may provide data related to AT&C losses (in a format) to the FOR Secretariat, which will compile, analyse and send the information to the Ministry of Power for reconsideration.

B) LONG TERM SUSTAINABILITY OF THE DISCOMS —COMMITTEE TO FORMULATE GUIDELINES FOR REDUCING EMPLOYEE COST OF THE DISCOMS.

9. Chairperson, HPERC apprised the Forum that the sustainability of the Discoms is a matter of concern as they continue to operate at a loss. The focus seems to be on addressing losses rather than improving efficiency. In Himachal Pradesh, the employee cost is exceptionally high, accounting for about 33% to 35% of expenses. The Commission's approval is required for new recruitments, except for technical positions, which has created friction between Discoms and the Commission. Additionally, there is a trend of creating numerous divisions and subdivisions near residences, which adds to the inefficiencies and further leads to an increase in tariffs. Discoms also blame SERCs for not allowing their prudent costs.

10. After detailed deliberation, the Forum decided that a Working Group may be constituted to study the viability of Discoms with a special focus on loss reduction, employee and other issues affecting the viability of the Discoms. A benchmarking may be done for employee related costs and losses depending on the topographical structure of the State. The composition of the said WG will be as follows:

i.	Chairperson, MPERC	-	Chairman of the Working Group
ii.	Chairperson, HPERC	-	Member
iii.	Chairperson, CSERC	-	Member
iv.	Chairperson, PSERC	-	Member
v.	Chairperson, APSERC	-	Member
vi.	Chairperson, TERC	-	Member
vii.	Chairperson, RERC	-	Member
viii.	Chairperson, JERC (Goa & UTs)	-	Member
ix.	Member (Finance), CERC	-	Member

AGENDA ITEM NO. 3: SELF-SUSTAINING MODEL FOR SMART METER IMPLEMENTATION UNDER RDSS- REFRENCES FROM MINISTRY OF POWER

11. Dy Chief (RA), CERC apprised the Forum about a reference from the Ministry of Power regarding smart meter implementation under RDSS which was a self-financing model. The MoP letter mentioned, inter-alia about APDCL of Assam having installed smart meters for 15 feeders resulting in a gain of around Rs. 40 per meter per month. Thereafter, the representatives of APDCL made a presentation on their experience **(Annexure-II).**

12. The representatives of APDCL explained the context of Smart Metering with Advanced Metering Infrastructure (AMI), the smart meter ecosystem, its associated benefits and the status of smart meters in APDCL. The representatives of APDCL informed that the attendees that they have conducted a comparative analysis to study the behavioural change of consumers after installing smart meters. They found that consumers have become more aware of their electricity usage leading to a trend of decreased consumption. Smart meter installations have also helped them increase billing and collection efficiency and reduction of technical and commercial losses of the Discoms resulting in financial gains. They also informed that they had conducted a performance analysis post-installation of smart meters for a sample set of consumers which indicated significant savings per consumer with an increasing trend in savings. Finally, they presented various consumer engagement initiatives that APDCL had undertaken.

13. After detailed deliberation, members of the Forum requested APDCL to conduct a counter-factual analysis for the previous years and establish a correlation between the increase in revenue and installation of smart meters, which would in turn reflect the revenue increase solely attributable to smart meters installation. The report may be forwarded to the FOR secretariat which could then be circulated to the other SERCs.

AGENDA ITEM NO. 4: IMPLEMENTATION OF CERC REGULATIONS ON IEGC, GNA AND SHARING OF TRANSMISSION CHARGES AND LOSSES - PRESENTATION BY REPRESENTATIVE OF CERC

14. The Forum was informed of the recent CERC notifications on IEGC, GNA, and the Sharing of Transmission Charges and Losses. Chief (RA), CERC mentioned that as per the Electricity Act, 2003, the State Grid Codes have to be in accordance with the Grid Code notified by CERC. As such, the new Grid Code issued by CERC and made effective from the 1st October 2023 assumes importance. States' Regulations to align in concordance with the notifications issued in compliance with the Electricity Act 2003. Thereafter, Jt Chief (Engineering), CERC made a presentation on the above-mentioned CERC Regulations **(Annexure-III).**

15. Jt. Chief (Engg.), CERC stated that IEGC is the mother code for the Indian Power Sector that defines the roles of various organizations, optimal power systems operations, power market support, planning, connection, commissioning, reactive power compensation and various other verticals. During the presentation, she elaborated on the ideation behind the Resource Planning Code, Connection Code, Protection Code, Commissioning and Commercial Operating Code, Scheduling and Dispatch Code which included SCED and SCUC, and Cyber Security Code. Chief (RA), CERC drew attention to the important provisions of Resource Adequacy and reserves, which are a must for the safe and secure operation of the grid and for meeting the consumer demand in all time horizons optimally. He also emphasized upon the concept of obligation to supply by the Gencos even if they opt for Unit Shut Down (USD). Jt. Chief (Engg.), CERC further briefed the Forum about provisions of the GNA Regulations, specifically on the enhanced flexibility and improved power dispatch capabilities under the new GNA regime.

16. Chairperson, TNERC requested the Forum to develop a Model GNA framework so that the same can be adopted by the SERCs.

17. The Forum noted the same and decided that the same may be referred to the Standing Technical Committee for a suitable recommendation for consideration by the Forum.

ANEGDA ITEM NO. 5: REPORT OF THE FOR SECRETARIAT ON DATA CAPTURED ON REGULATORY WEBTOOL MAINTAINED BY IITK - REFERENCE FROM FOR SECRETARIAT

18. Dy Chief (RA), CERC apprised the Forum about a report prepared by the FOR Secretariat on data captured in the Regulatory Webtool maintained by IITK, on two topics viz. timelines of Tariff and ACoS-ABR ratio. It was highlighted that some States have not updated the data, resulting in gaps. Furthermore, it was informed that the nodal officers of the ERCs are expected to provide the data into the tool, which would be verified by IIT Kanpur.

19. Chairpersons of TNERC, HERC and BERC informed that data with regard to their States were either missing or not correct. Chairperson, HPERC raised concerns about this process and suggested the need for software development that can extract the data automatically from the Commission website, without requiring direct intervention from nominated officials. Members also sought the list of nodal officers available with the FOR Secretariat for their information.

20. After discussion, the Forum agreed on the need for better engagement with the nodal officers on the issue and also endorsed the idea of exploring the development of software solutions that can automate the process of capturing and populating the Regulatory Tool website.

ANY OTHER AGENDA ITEM AND CONCLUSION

22. VENUE OF NEXT FOR MEETING

Chairperson, OERC offered to host the next meeting of the Forum in Konark, Orissa in January, which was accepted by the Forum.

23. ADDRESS BY OUTGOING CHAIRPERSON, HERC

Chairperson, HERC, in his address, stated that it was a great privilege and honour for him to be part of the Forum. He added that the Forum has been executing its functions with great firmness be it conducting meetings, forming sub-committees, research work and generating ideas. He stated that being part of FOR was extremely enriching. He wished FOR for its further glory and success.

24. VOTE OF THANKS

Delivering the vote of thanks Secretary, FOR/CERC extended his heartfelt gratitude to all the members of the Forum for their valuable contribution and active participation in enriching the discussion. He extended his special thanks to the Chairperson, FOR / CERC for his guidance and inspiration. He also took the opportunity to express special thanks to the Chairperson, UERC and his team who have made wonderful arrangements to ensure that the event is a success and also for a very hospitable stay. He also appreciated the efforts of the FOR secretariat for the efforts they have put for conducting the meetings and making them a success.

***

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

Date: 15th December 2023 - Friday

Platform: M S Teams (Virtual Mode)

List of participants: Annexure – I

1. At the outset, Shri Jishnu Barua, Chairperson, CERC / FOR welcomed all the members to the special meeting of FOR. He informed the Forum that the special FOR meeting has been convened to discuss certain important agenda items.

2. Reflecting on the agenda items, he informed the Forum that the first discussion would be on the FOR-Model Staff Regulations, considering the fact that Commissions are struggling to get quality manpower and that officers and Staff of the Commission need to be motivated enough by giving better salary structure and perquisites as also enabling inter-Commission transfers. He thanked Dr. B. N. Sharma, Chairperson of RERC and the members of the WG for bringing out an elaborate Model Staff Regulation which could be considered by FOR. Chairperson FOR added that the second agenda item is a discussion on the overseas orientation programs for Chairpersons of SERCs, while the last item is with respect to Pay and Allowances for Chairpersons and Members of the Electricity Regulatory Commissions.

3. Thereafter, the agenda items were taken up for discussion.

AGENDA 1: MODEL STAFF REGULATIONS

4. The Forum was briefed about the decision of the FOR in its 83rd meeting held on

18th November 2022, where a need was felt to assess the staffing requirements in the Central and State Commissions vis-à-vis other sector regulators such as SEBI, PFRDA, IRDAI, CCI, NFRA etc. and examine the constraints faced by them in attracting personnel with requisite skill level, and find appropriate solutions. Accordingly, a Working group was constituted under the chairmanship of Dr B.N Sharma, Chairperson, RERC, with Chairpersons of Assam ERC, Delhi ERC, Himachal Pradesh ERC, Karnataka ERC and West Bengal ERC as Members.

5. The Members of the WG informed the Forum about the deliberations of the WG on different aspects of the Model Regulations, including pay, structure etc and placed its report for consideration by the Forum

6. Thereafter, Asst Secretary (P&A), CERC made a presentation on the salient features of the report and Model Staff Regulations **(Annexure-II)**

7. The Forum members deliberated on the need for flexibility in the Model regulations as the staff structure and needs of various SERCs were different. After deliberation, the following was agreed by the FOR:

a) Designations of various positions be left at the discretion of the respective ERC.

b) Deputation from educational institutions should be restricted from such institutions owned and controlled by the government (centre/state).

c) Provision for absorption only at the entry-level after an employee has served a minimum of two (2) years in the post.

d) The minimum qualification for the post of Secretary should be a Master's degree with a degree in law as desirable.

e) Advance increments on absorption to be restricted to five (5).

f) The Model regulations to define functional divisions.

8. The Forum adopted the Model Staff regulations and directed the FOR Secretariat

to incorporate the above suggestions and circulate the same to all the members of the Forum

AGENDA 2: ORIENTATION PROGRAMS FOR CHAIRPERSONS OF ERCS

9. The Forum was briefed on the previous Orientation Programs for Chairpersons of the ERCs, which included an international visit component. Last year, two batches travelled to Brussels and Oslo in collaboration with USAID. While the FOR Secretariat reimbursed the return business class airfare from New Delhi to the destination country for the Chairpersons, USAID incurred all other costs with respect to the program.

10. However, as the proposal from USAID for the current financial year has been delayed inordinately due to internal permissions at their end, and funds are available with FOR for the said program for the current financial year, it was suggested that the FOR secretariat can explore proposals from other organizations, having the capacity to handle overseas programs. It was also proposed that FOR consider reimbursing economy airfare.

11. After detailed deliberation, the Forum agreed on the following points:

a. For any international component of the orientation program for Chairpersons of SERCs, FOR to allow business class airfare.
b. All expenses for conducting such programs will be borne by FOR. In case of paucity of funds, the visit-specific differential amount, if any, is to be allocated among the visiting SERCs as an additional contribution for the year.
c. There should be flexibility for the SERCs to choose whether they want to travel in group booking or as per their own plan. As such, options are to be solicited

from the SERCs while planning the program. If any Chairperson opts to travel as per his/her own plan, the FOR Secretariat shall specify a ceiling amount which shall be reimbursed to the SERC, and all extra costs incurred shall be borne by the respective Commission.

d. For the current financial year, the FOR secretariat will explore proposals from other organizations to conduct the program at Rome, Florence in the last week of April 2024
e. FOR Secretariat to conduct a separate program for Chairpersons/ Members of Joint ERCs and CERC.

AGENDA 3: ALLOWANCES / SALARY FOR COMMISSIONERS

12. The Forum noted that there is a wide diversity in the status, pay and allowances of Chairpersons and Members of various ERCs. After discussion, it was decided that the would be discussed further in the next FoR meeting .

CONCLUSION

13. At the end of the meeting, the Secretary, FOR /CERC thanked all members for their valuable inputs on the agenda items.

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

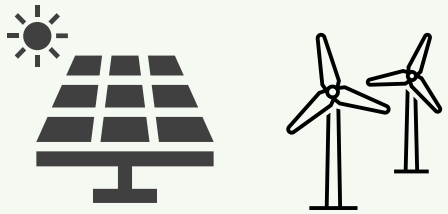
*****

89th Meeting of the Forum of Regulators (FOR)

[redacted]

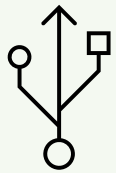
17/01/2024

Central Pool validity of 5 years



Generator/Producer
ISTS Connected

PPA

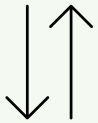


Intermediary
Procurer
(SECI, NTPC, SJVNL, NHPC)

PSA

End Procurer
DISCOM/ Open Access Consumer

Data sharing by IP to IA related to PPA/PSA along with the contracted energy supplied



URET
Apply to power procured by end procurer only

The URET shall be determined by dividing the total amount to be paid under the PSA for a given month by the total amount of electricity supplied

ग्रिड-इंडिया
GRID-INDIA

Implementing Agency

Grid-India to compute the uniform renewable energy tariff on a monthly basis

Chronology

Rules – Notification date - 29.12.2022

- Electricity (Amendment) Rules, 2022

Implementing Agency – 17.03.2023

- GRID-INDIA notified as Implementing Agency

Amendment - 30.06.2023

- Electricity (Amendment) Rules, 2023

Approval of Procedure - 25.10.2023

- Procedure Approved by Central Govt.

Action Points:

- Start Date for each category of the central pool
- Notification of Intermediary Procurer

Implementation of Uniform Renewable Energy Tariff

MoP vide gazette notification dated 29.12.2022 notified Electricity (Amendment) Rules, 2022 and subsequent amendment dated 30.06.2023 which, inter-alia, included implementation of Uniform Renewable Energy Tariff. The salient points from the relevant rules are presented below:

- Different central pool for each sector of renewable energy sources
- Duration of central pool: 5 years; New pool to be formed every 5 years
- All Contractual obligations among the generators, IP and end procurer (EP) to be governed by bidding documents and will have no bearing on URET
- URET does not affect the renewable energy tariff discovered through competitive bidding
- The Appropriate Commission shall adopt the tariff discovered under section 63 and as per provisions of Bidding guidelines
- End procurer requires approval from State Commission for procurement from pool at URET tariff.

Implementation of Uniform Renewable Energy Tariff

- Implementing Agency (IA):
  - To compute Monthly Uniform renewable energy tariff (URET)
  - Monthly account statements for adjustment of surplus/deficit tariff among intermediary procurers
  - No liability except computing tariff, and shall be kept indemnified
  - Frame procedure for these rules with approval of central govt
- Intermediary Procurer (IP) to pay to the other IP as per the monthly account statements within 15 days
- Change in law - Shall be reflected in the pooled tariff in accordance with the bidding documents
- Scheduling to be done as per the bilateral agreement directly from generators to end procurers
- Scheduling, accounting, deviation settlement mechanism as per existing regulations of appropriate commission
- Trading margin – payable by end procurer to intermediary procurer
- IP shall raise monthly bill as per URET in accordance with PPA

Procedure

- The start date of the central pool will be separately notified by Central Government
- IP to align bidding documents with the Rules and the procedure.
- Any deviation from the Standard Bidding Guidelines (SBG) will require necessary approvals
- The sale of electricity due to excess generation/early commissioning shall be governed by the respective PPA/PSA

STEPS involved:

- Registration of Intermediary Procurer (IP)
  - one time exercise for each IP
- Submission of Monthly data by IP
- Computation of URET by IA
- Publication of URET on the website

Timelines to be followed by various agencies

Intermediary Procurer (IP):

- It shall submit energy details to the Implementing Agency within 4 days of publication of REA
- An IP shall within fifteen days make the payment as per the monthly account statements to the other intermediary procurer

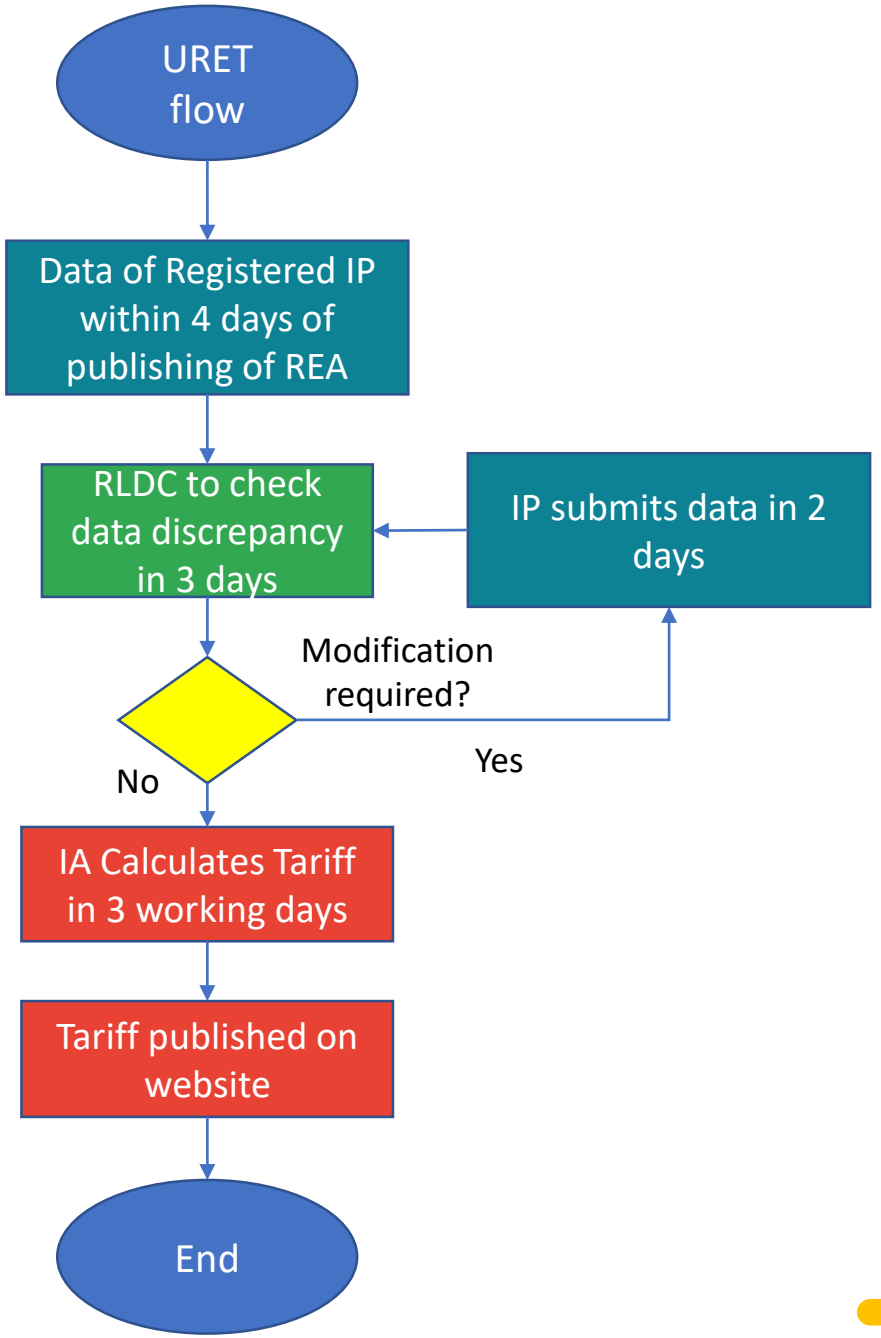
RLDCs:

- The submitted data shall be verified by respective RLDCs within 3 days and submit it to IA
- In the event of any discrepancy in the data, IP needs to be informed within 2 days . Therefore, IP shall submit the data as per the discrepancy identified by RLDCs.

Implementing Agency (IA)

- IA will publish Uniform Renewable Energy Tariff for each Source-wise Central Pool on its website within 3 working days
- The Tariff Adjustment Addend and Monthly Account Statements (as per format E) shall be published by the Implementing Agency within 7 days of submission of data by Intermediary Procurer and verification of the data by RLDC

Data flow (Monthly) for calculation of Uniform Renewable Energy Tariff



27

Eligibility Conditions of Generator/Producer

Generator/Producer will be based on a Renewable Energy Source

Generator/Producer will be connected at Inter State Transmission System; and

Energy from the Generator/Producer will be procured by the designated intermediary procurers under section 63 of the Act and as per provisions of bidding guidelines notified by the Central Government from time to time and

The PSA for such capacity of the Generator with the Intermediary Procurer has been done after the start date of the respective Central Pool.

Eligibility Conditions of End Procurer

It has a license to undertake distribution and retail supply of electricity granted under section 15 of the Act or is designated by the State Government to procure power on behalf of the licensees undertaking distribution and retail supply of electricity AND it must obtain approval from the relevant State Commission before procuring electricity from a pool at URET, OR

It is an open access consumer.

Eligibility Conditions of Intermediary Procurer

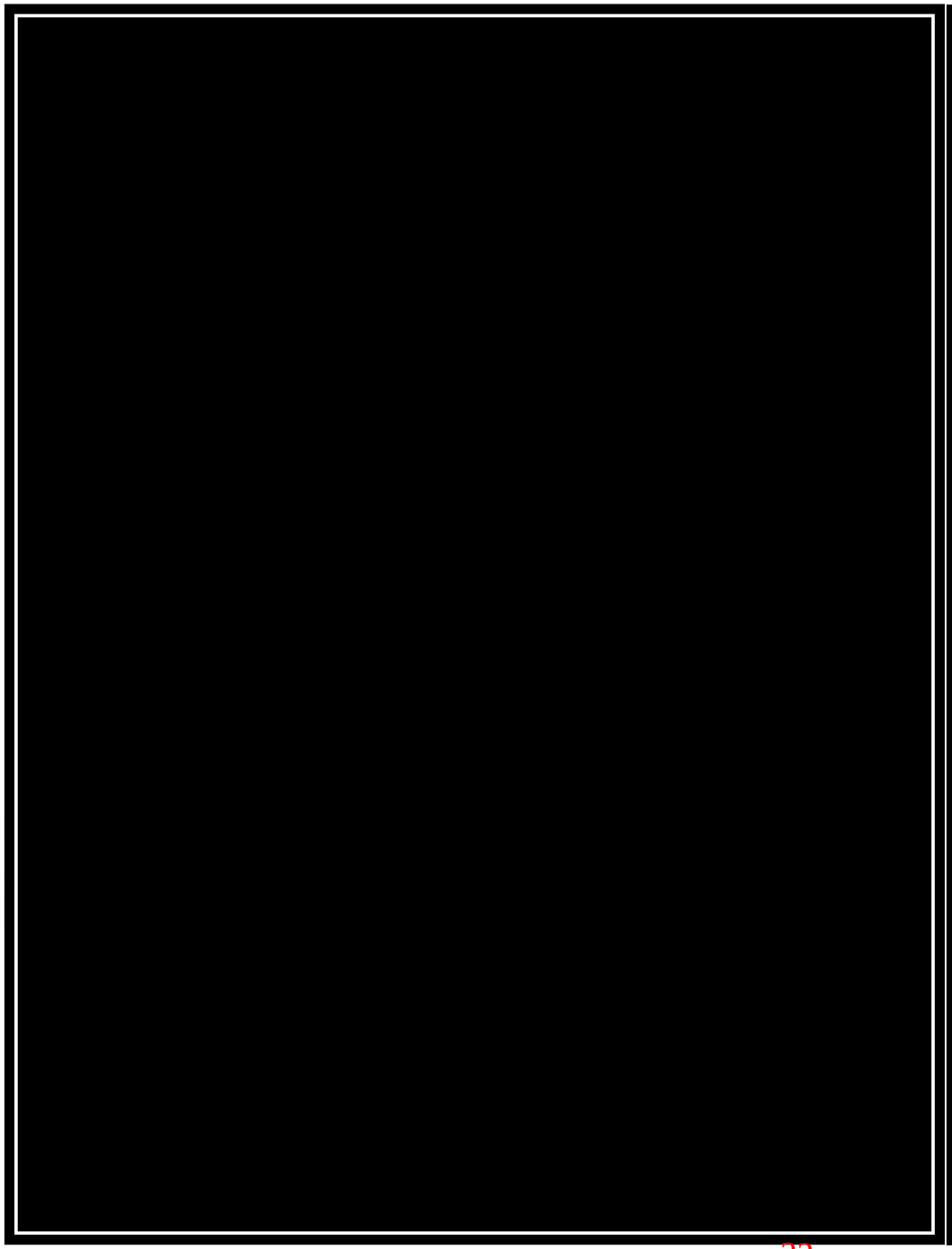
The Intermediary Procurer is designated by an order made by the Central Government as an intermediary between the end procurer and the generating company to purchase electricity from generating companies and resell it to the end procurer by aggregating the purchases.

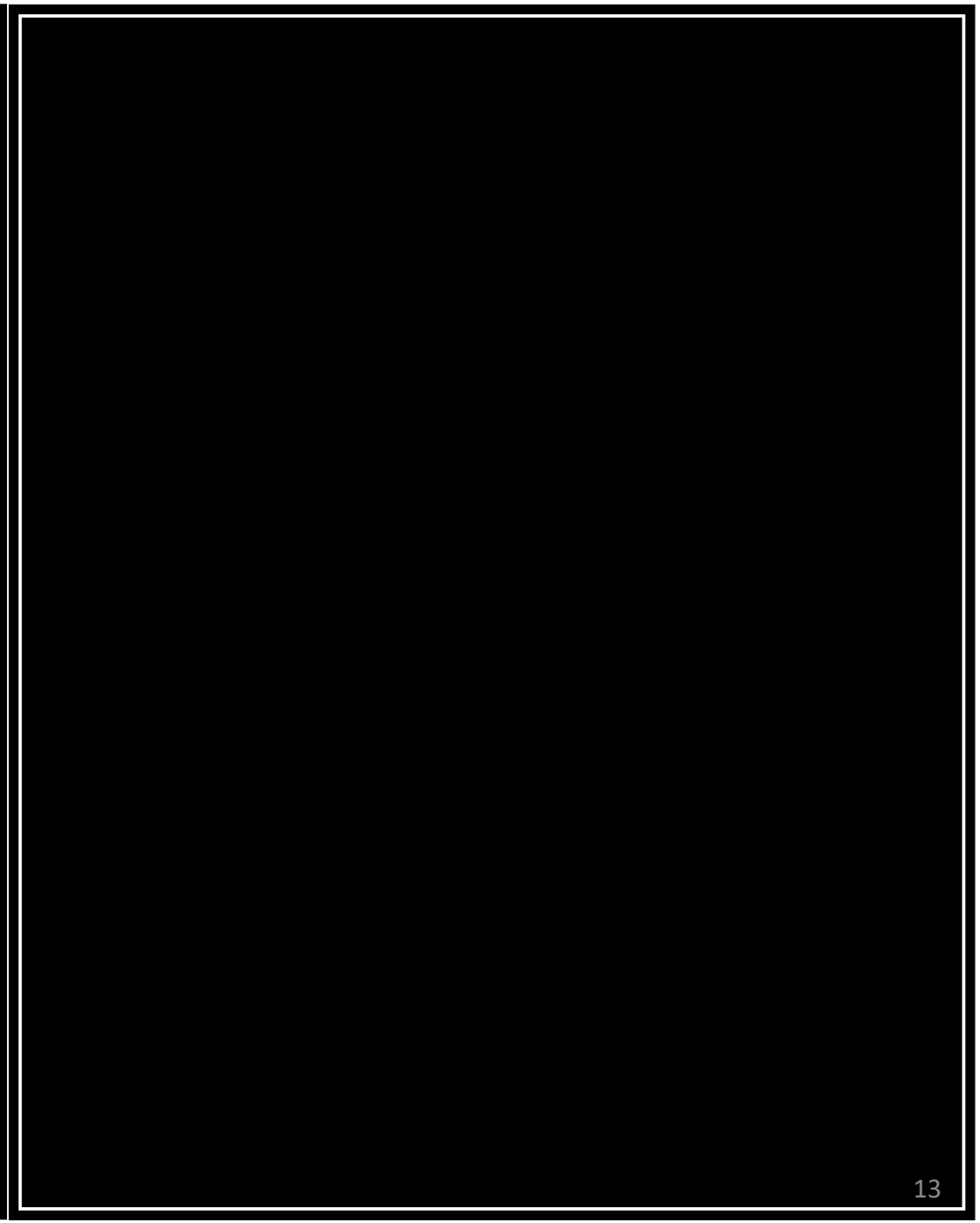
The Intermediary Procurer Company should have a valid trading license.

Registration of Intermediary Procurer

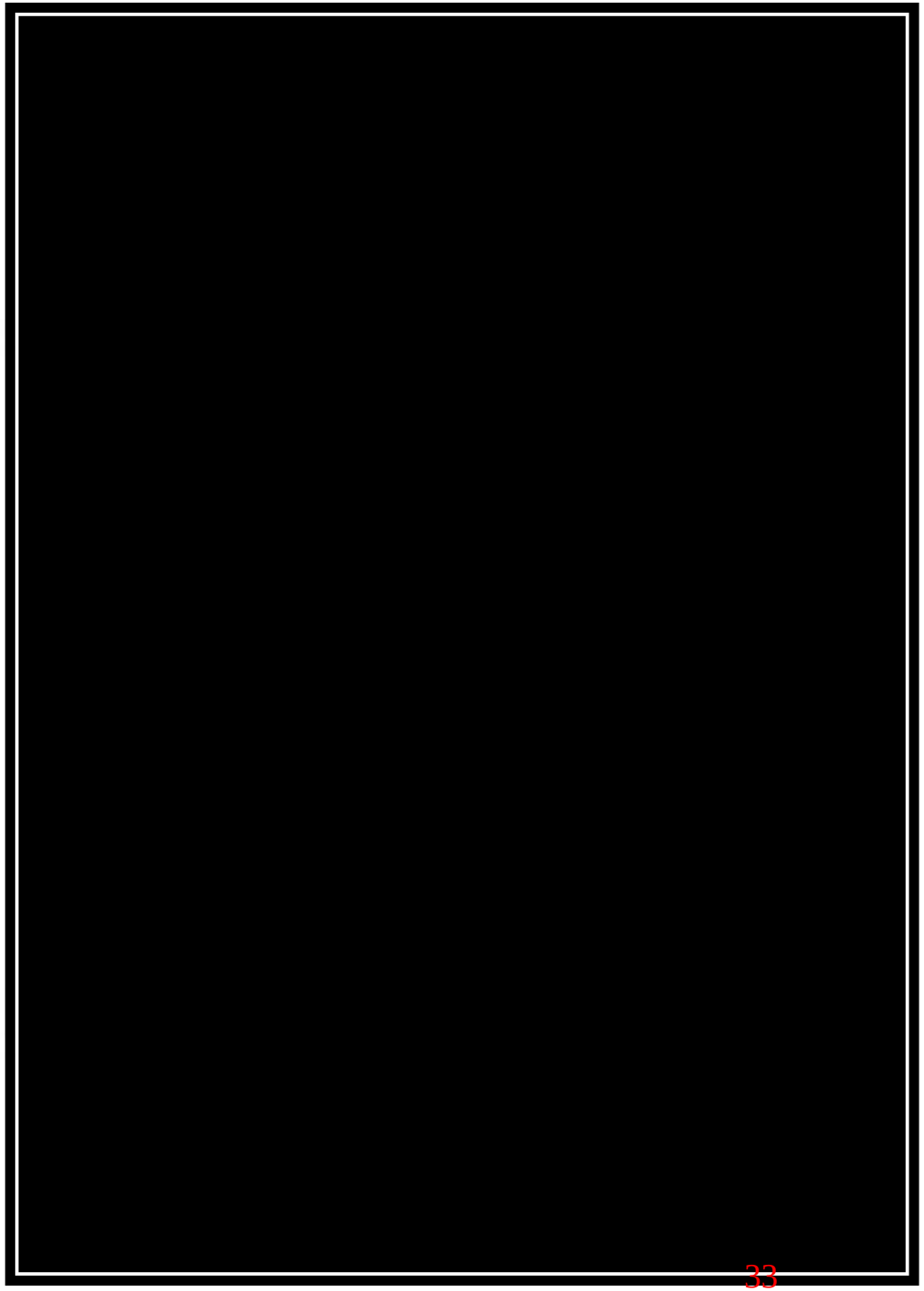
- Format-A – General details of Intermediary Procurer
- Format- B – Declaration to Indemnify IA
- Format C – Details of Scheme and associated information in excel form. Submission of relevant PPA/PSA.
- Copy of order issued by the Central Government designating it as an Intermediary Procurer.
- Copy of valid trading license.

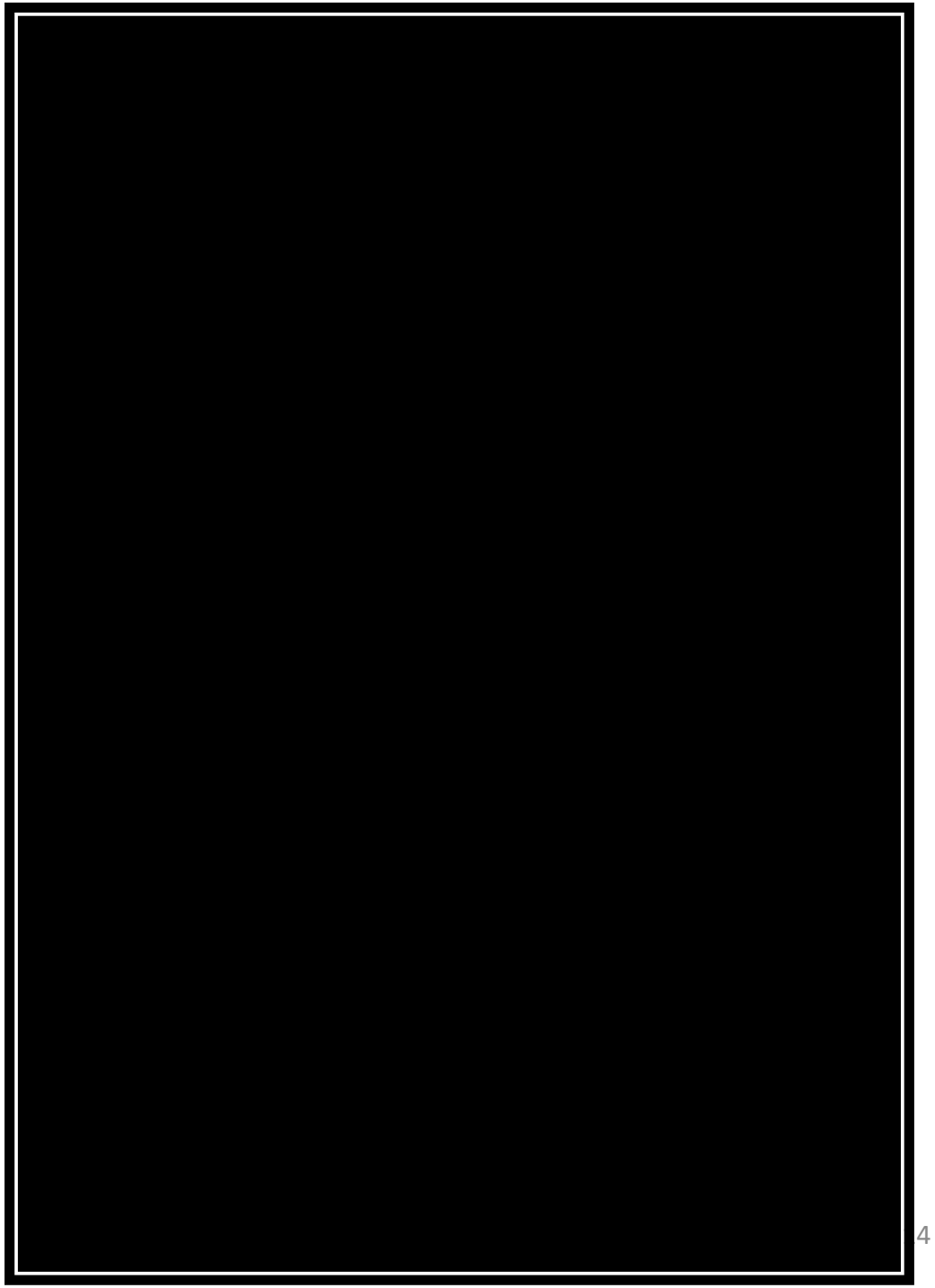
Formats to be used at the time of Registration by IP





Formats to be used by Registered IP for sharing monthly data





COMPUTATION OF TARIFF - ILLUSTRATIONS

Computation:

Intermediary Procurers	2
RE Generator	6
End Procurer	7
PPA Capacity (MW)_IP1	250
PSA Capacity (MW)_IP1	250
PPA Capacity (MW)_IP2	280
PSA Capacity (MW)_IP2	280

S. no	Scheme/ PPA	RE Generator	End Procurer	Type of EP	Contracted Capacity which forms part of Pool	Tariff PPA	Total Tariff= (Tariff PPA + Trading Margin)	Schedule Energy during the Month	Tariff to be paid =Schedule Energy* Total Tariff
		(Name)	(Name)	(D/S/OA)	(MW)	(INR/kWh)	(INR/kWh)	(MWh)	Rs
					(A)	(B)	(C)	(D)	E= (C) * (D)
1	SCHEME1_IP1	XXX	AAA	D	100	3.75	3.82	14400	55008
2	SCHEME1_IP1	XXX	BBB	OA	20	3.75	3.82	2880	11002
3	SCHEME2_IP1	YYY	CCC	D	120	3.2	3.27	17280	56506
4	SCHEME3_IP1	ZZZ	DDD	OA	10	3.9	3.97	1440	5717
5	SCHEME4_IP2	WWW	EEE	D	150	5.9	5.97	21600	128952
6	SCHEME5_IP2	VVV	FFF	OA	90	5.8	5.87	12960	76075
7	SCHEME6_IP2	UUU	GGG	D	40	5.7	5.77	5760	33235
								76320	366494

Tariff computed INR/kWh	**=∑E/∑D**	**4.8021**

Account Statement

URET	T	4.8021								
		IP1				IP2				Total Sum (IP1+IP2)
Generator		XXX	YYY	ZZZ	Sum	WWW	VVV	UUU	Sum	
Tariff PPA	A	3.75	3.2	3.9		5.9	5.8	5.7		
Total Tariff	B	3.82	3.27	3.97		5.97	5.87	5.77		
Energy Scheduled to DISCOM (MWh)	C	14400	17280	0	31680	21600	0	5760	27360	59040
Energy Scheduled to OA (MWh)	D	2880	0	1440	4320	0	12960	0	12960	17280
Total Energy Scheduled (MWh)	E=C+D	17280	17280	1440	36000	21600	12960	5760	40320	76320
Amount receivable from DISCOM	F=T*C	69,149,887	82,979,864	-	152,129,751	103,724,830	-	27,659,955	131,384,785	283,514,536
Amount receivable from OA	G=T*D	13,829,977	-	6,914,989	20,744,966	-	62,234,898	-	62,234,898	82,979,864
Total Amount receivable from End Procurer	H=F+G	82,979,864	82,979,864	6,914,989	172,874,717	103,724,830	62,234,898	27,659,955	193,619,683	366,494,400
Total Amount to be Realised by IP	I=H	82,979,864	82,979,864	6,914,989	172,874,717	103,724,830	62,234,898	27,659,955	193,619,683	366,494,400
Amount as per PPA Tariff	J=B*E	66,009,600	56,505,600	5,716,800	128,232,000	128,952,000	76,075,200	33,235,200	238,262,400	366,494,400
Total Amount to be Paid to Generator	K=A*E	64,800,000	55,296,000	5,616,000	125,712,000	127,440,000	75,168,000	32,832,000	235,440,000	361,152,000
Amount to be paid to other IP	L=I-J				44,642,717				(44,642,717)	0
Margin Realised by IP	M=I-L-K				2,520,000				2,822,400	5,342,400
Trader Margin/Unit Scheduled Energy	N=M/E				0.070				0.070	0.070

Next Steps: Action Points

START DATE

FOR EACH CATEGORY OF THE CENTRAL POOL TO BE NOTIFIED BY CENTRAL GOVT.

INTERMEDIARY PROCURERS

TO BE NOTIFIED BY CENTRAL GOVT.

ग्रिड-इंडिया
GRID-INDIA

Thank You

Assisted by:

Deloitte.

Ceiling Tariffs for Distribution Sector in India

FORUM OF REGULATORS (FOR)

Discussion on Draft Report

January 2024

Contents

Introduction

Scope of Work

As per Terms of Reference

Objective:

To study the feasibility of, and to develop a roadmap for implementation of ceiling tariff for retail sale of electricity in the distribution sector in India

Scope of Work

A. Legal and policy review

To study the existing legal, policy and regulatory framework on ceiling tariff for retail sale of electricity in India.

B. International review

To review the international experiences on implementation and operation of ceiling tariff for retail sale of electricity in Distribution sector.

C. Identify key challenges for Ceiling Tariffs

To identify the challenges in implementation of ceiling tariff for retail sale of electricity in India.

D. Evolve possible options for Ceiling Tariffs

To evolve possible options/ scenarios for implementation of ceiling tariff in Indian context based on the learnings gained from the above exercises

E. Develop roadmap/ framework

To develop a road map/ framework for implementation of the ceiling tariff regime for retail sale of electricity for the DISCOMs in India.

Legal and Policy Review

For electricity tariff determination

SERCs may determine ceiling tariffs in case of two or more licensees

- Section 61 of EA 2003:

  'The Appropriate Commission shall, …. specify the terms and conditions for the determination of tariff …..'

- Section 62 of EA 2003:

  '(1) Appropriate Commission shall determine the tariff …. for …. (d) retail sale of electricity …. Provided that in case of …. two or more distribution licensee …. may ….. fix only maximum ceiling of tariff

  (4) No tariff … be amended, more ... than once in any financial year'

- Section 86 of EA 2003:

  'State Commission shall …. determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk or retail …'

Cost Plus tariffs; Performance based Regulations

- Section 5.11 of Tariff policy 2016:

  'Tariff policy lays down the following framework for performance-based cost of service regulation in respect of aspects common to generation, transmission as well as distribution ….'

  a) ….The State Commission may also consider price cap regulation based on comprehensive study …

- Each SERC issues tariff regulations individually for their respective State, basis their due diligence and state specific considerations. Or Joint Electricity Regulatory Commission (JERC) in case of State of Goa and UTs

National and International Review

National Review

Case studies of ceiling/ uniform tariffs or parallel licenses

Uniform Tariffs among DISCOMs

In states with multiple DISCOMs like GJ, RJ etc., SERCs determine uniform tariffs for entire state, using either:

1. **Adjustment in bulk power purchase cost:** In states like Odisha and Gujarat, power is purchased collectively by a single entity. cost of power for each DISCOM is adjusted to allow revenue recovery of ARR with same tariff
2. **Consolidated Surplus/ (Gap) for DISCOMs:** In states like Bihar and Haryana, SERC calculates consolidated surplus/ (gap) of ARR for all DISCOMs combined and may then allocate government subsidy to meet deficits of respective DISCOMs

JUSCO Ceiling Tariffs

- In Seraikela-Kharsawan District of Jharkhand, JUSCO* operates in parallel to JBVNL; **Both have their own power network**
- In 2007, JSERC approved Jharkhand State Electricity Board's (**JSEB) tariff, as ceiling for JUSCO**, till its own tariff is determined
- JSERC issued first tariff order for JUSCO in Jan-2010, for FY 2009-10

Mumbai – Parallel Licenses

- In Mumbai region, BEST, AEML, MSEDCL (limited to few suburbs) and TPC-D hold parallel licence
- MERC determines a separate tariffs for each of these DISCOMs; **No uniform tariff across**
- As per MERC's Protocol for migration of consumers, **a parallel DISCOM may supply to changeover consumers using network of other DISCOM**
- Commission determines 3-part tariffs: Energy, Wheeling and Fixed monthly; Changeover consumers from AEML to TPC, pay fixed and energy charge of TPC plus wheeling charge of AEML plus cross subsidy surcharge of AEML

** Now renamed to Tata Steel Utilities and Infrastructure Services Ltd.*

International Review

Case studies of ceiling tariffs

United Kingdom

- Domestic Gas and Electricity (Tariff Cap) Act 2018, requires Ofgem to determine a cap on rates charged by suppliers to domestic customers on Standard Variable or Default Tariffs
- Ofgem uses a bottom-up or cost plus approach to set Ceiling Tariffs, with following components:

Component	Methodology
Wholesale Cost	Indexed to fuel price index and capacity market auctions
Network Cost	Ofgem approved costs for T&D determined using RIIO model
Operating Cost	Baseline (as per benchmarking), indexed to inflation
Others	Policy costs for RPO. FIT etc.; Tax and EBIT margins
Headroom	Additional % of tariff, to set ceiling higher than efficient costs

Australia

- As per the Competition and Consumer Regulations 2019, AER determines a Default Market Offer (DMO) as the max price a retailer can charge to customer
- 1st DMO was set in 2019-20, using Top-Down Approach, as per publicly available information of Market Offers and Standing offers of various suppliers

Upper Bound = Median of Standing Offers

50th Percentile:

Baseline Cost

- Wholesale Cost
- Environmental Cost
- Network Cost
- Retail Cost

Projected for future years, basis factors like fuel price index and inflation

Lower Bound = Median of Market Offers

Others

- **Turkey:** Using a Price Equalization mechanism, the Regulator sets a uniform national tariff across 21 DISCOMs, with cross subsidy among them managed through a pool mechanism
- **Philippines:** ERC determines the rates that can be charged by Supplier of Last Resort (SoLR), for consumers who cannot find a retailer; not mandatory to supply below this rate
- **USA, Texas:** existing retailers were underselling to prevent competition; ERCOT set a temporary price floor; new retailers could supply below this floor but existing players had to supply above the floor rates

Possible options for Ceiling Tariffs

In Indian Context

Outline of Ceiling Tariffs

Possible options

Ceiling Tariffs may be defined as a **maximum Average Billing Rate (ABR)** that may be charged to **various consumer categories** in the **State or a particular area**, during the **Control Period** as per tariff regulations, determined by the Appropriate Regulatory Commission using **normative or approved costs** as per tariff regulations

Form

1 Modes of Ceiling Tariff

Price Cap
State/ DISCOM tariffs can be set below cap

Indexed
Indexing tariffs to Market Price or within a range of tariff

Default Tariff
A common tariff to be offered to all consumers

2 Layer/ Level of Ceiling Tariff

ABR
Limit or range or Default rate for ABR allowed from consumer

ACS (Network)
excl. power purchase cost

ACS (Overall)
Incl. power purchase cost

Tariff Rate
Defining tariff rate itself in per KW and per Kwh

Calculation

3 Formulation of Ceiling Tariff

Normative
Based on costs of operating an efficient utility

Average/ %tile
Basis actual tariffs of various DISCOMs

Paying capacity
Consumer willingness / capability to pay

4 Applicability

Single rate

State wide
For states with uniform tariffs or single DISCOM

Category wise

Area wise
For parallel licenses or DISCOM with diff. tariffs

For select consumers

5 Period

Annual

Dynamic

Periodic
For a control period of 3 to 5 years, but separate ceiling for each year

Possible methodologies for Ceiling Tariffs

Bottom-up vs Top-down approach

Bottom-Up Approach

Cost plus approach, as sum of all prudent costs incurred for supply of power

- In line with **Tariff Policy and tariff regulations** issued by various SERCs
- Gives clear indication of **efficient costs** that may be allowed in ceiling tariffs
- **Empowers SERCs** to prudently analyse various costs elements, relevant to their state/ region

Top-Down Approach

Tariff based on benchmarking of available rates of various utilities

- **Relevant for a competitive market**; not suitable in current context of Indian power distribution sector, given the lack of multiple/ parallel distribution licensees in most of the states/ regions
- Even in states like Gujarat, Bihar or Haryana where more than one DISCOM exist in the state, the **cost structure of DISCOMs is similar** and does not offer a range of tariffs for assessment

Overall methodology

For determination of Ceiling Tariffs

Power | *Network* | *Supply*

Cost of Power

- Based on existing PPAs and other sources of power of the DISCOM
- Cost and energy mix as approved by the SERC
- Power purchase cost adjusted for approved network (inter and intra-state transmission and distribution) losses

Transmission Cost

- Inter-State Transmission Charge, as published by POSOCO
- Intra-State transmission Charge, as determined by SERC

Distribution Cost

- Wheeling charges for distribution network
- Determined basis allocation norms or as separate ARR (corresponding to a portion of DISCOMs Depreciation, ROE, Interest and O&M expense), as determined by SERC

Operating Cost (supply)

- Costs related to retail supply activities such as metering, billing, collection and other commercial activities (remaining portion of total ARR less wheeling ARR less PPC)

Headroom Margin

- Headroom, to allow margins for competition among multiple DISCOMs/ suppliers

Network Costs

Methodology for computation

Transmission Charge:

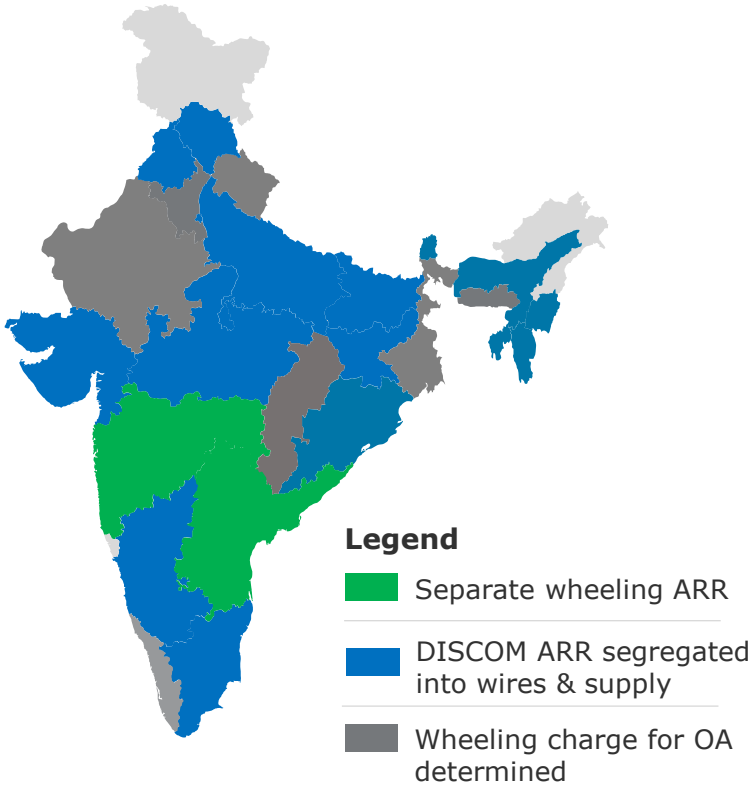
- As approved in Tariff/ MYT Order for Inter-State and Intra-State Transmission
- Considered on a per unit basis by dividing the approved amount in ARR with and quantum of approved energy sales

Distribution Wheeling Charge:

- Commission approved Wheeling ARR may be considered for calculation of distribution wheeling charge
- In case of multiple licensees, weighted average* wheeling charge of all DISCOMs in the state (basis their energy sales) may be considered
- In case there are parallel licensees in DISCOM's area, then wheeling charges of DISCOM with ***most expansive network*** may be considered
- In states like Haryana, where separate wheeling ARR is not determined or segregated basis norms, wheeling charge for Open Access consumers may be considered

**Total of Wheeling ARR of all DISCOMs divided by Total Energy sales of all DISCOMs*

Methodology followed for wheeling ARR/ charges



AR: OA charges not determined by SERC in Tariff Order; Regulations define wheeling charge as (ARR-PPC-Trans. Charge)/ (Average Load projected x 365); J&K: Neither ARR is segregated nor wheeling charge is determined in tariff order

Cost of Power

Methodology for computation

Maybe determined basis actual PPAs of DISCOMs in the state, as follows:

Source wise cost of power

- Thermal, Hydro, Solar etc.
- As per list of PPAs and other sources of power approved by SERC in Tariff/ MYT order

Weighted average

- Weighted average for various sources, basis energy mix of DISCOMs, approved by SERC
- Weighted average for all DISCOMs in the state

Adjusted for losses

- Power purchase cost per unit, adjusted for losses
- Inter-state sources of power adjusted for CTU, STU and Distribution loss
- Intra-State sources of power adjusted for STU and Distribution losses

FPPCA pass-through, as per extant SERC Regulations

Determining cost of power using exchange price as benchmark (like in international case studies of UK/ Australia) may not be suitable in Indian context, as:

- Majority of the power procurement is done through long term PPAs (of upto 25 years)
- High variations are observed in Market Clearing Prices on power exchanges
- Power mix varies significantly from DISCOM to DISCOM

Operating Costs (supply)

Methodology for computation

ARR Segregation

- **Where segregated ARR for supply business is available:** Operating Cost may be taken as supply business ARR (less PPC), divided by energy sales
- **Where segregated ARR for supply business not available:**

$$\frac{\text{Total DISCOM ARR} - \text{Less: Cost of Power} - \text{Less: Transmission Expense} - \text{Less: Wheeling charge for Open Access multiplied by energy sales}}{\text{Energy Sales}}$$

Weighted Average

- Weighted average of all DISCOMs (basis their energy sales) in state
- If parallel licensees exist in a DISCOM's area, the Commission may include their operating costs in the weighted average
- Any smaller utilities with disproportionately high per-unit costs, due to a smaller consumer base, maybe excluded

Headroom Margin

- Taking cue from international experience of UK, a headroom margin may be allowed in Operating Costs (Supply)
- The margin may be allowed over and above the Operating Cost (Supply)
- May be calculated based on variation between MYT approved costs and Trued-up or Actual Costs, in recent years or basis cost variation in following factors:

1. O&M Expense
2. Capital Expenditure
3. Bad Debt provisioning
4. Any other uncontrollable expense

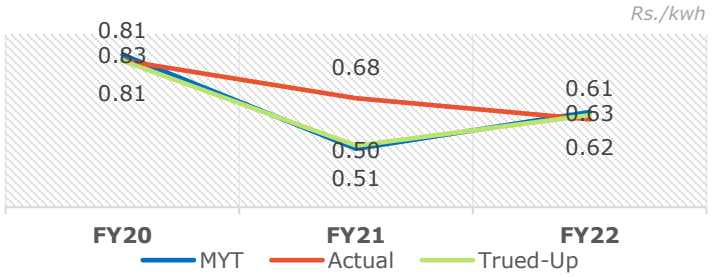
Illustrative Ceiling Tariffs

Headroom Margin

Illustrative calculations

Variations in Operating Cost (Supply) in past True-Ups

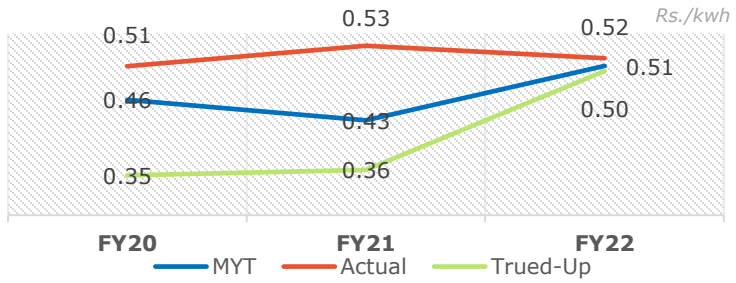
Maharashtra



Max variation:

- MYT vs Actual: 18 pa./unit
- MYT vs True-Up: (0.11) pa./unit

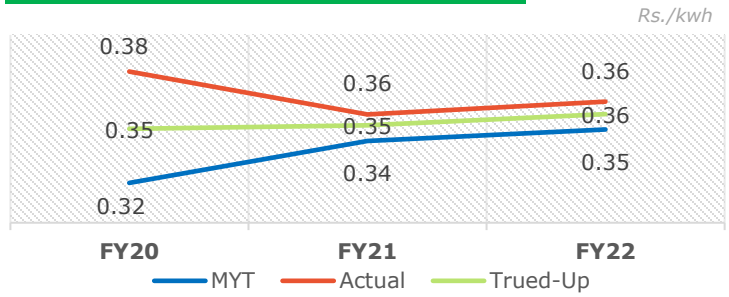
Haryana



Max variation:

- MYT vs Actual: 10 pa./unit
- MYT vs True-Up: (1) pa./unit

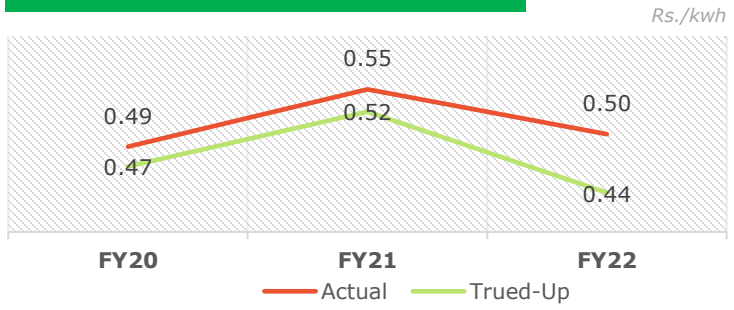
Bihar



Max variation:

- MYT vs Actual: 6 pa./unit
- MYT vs True-Up: 3 pa./unit

Tamil Nadu



Max variation:

- Actual vs True-up: (2) pa./unit
- MYT vs Actual: NA; MYT vs True-Up: NA

On an average, a variation of ~11 paisa per unit is observed in operating cost (supply) between MYT vs Actual figures in select states. Accordingly, headroom of 10 paisa per unit may considered in ceiling tariffs

10 Paisa per unit

Headroom in Operating Cost (Supply)

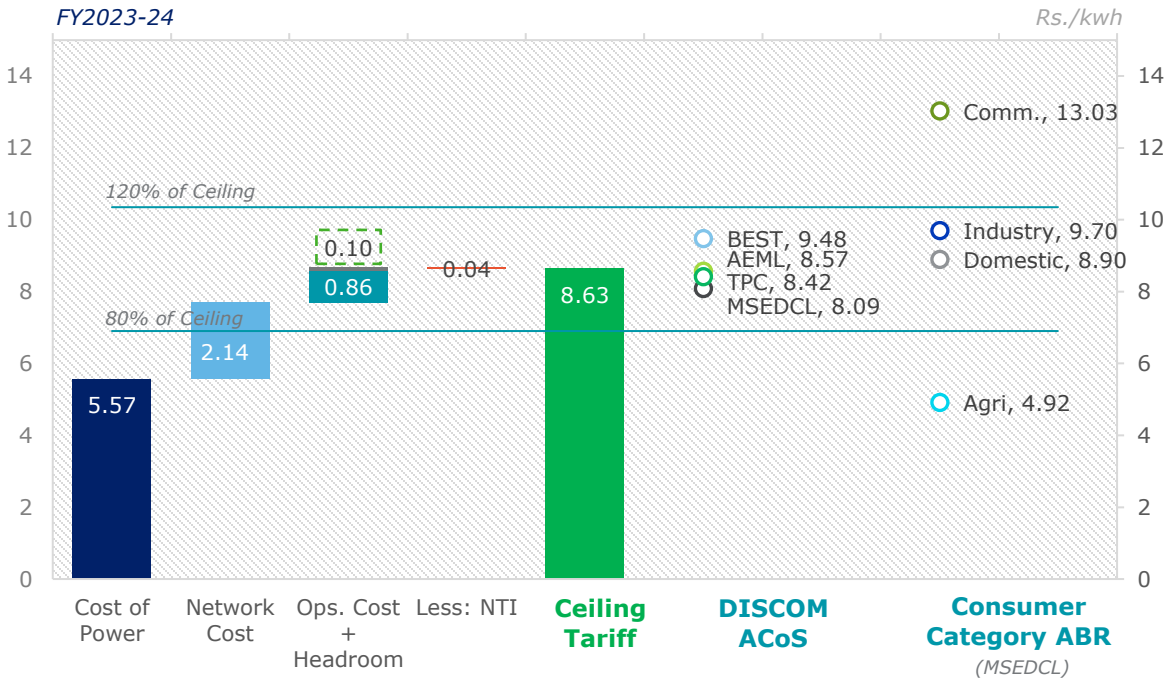
Note: all figures weighted average for all DISCOMs in the state; Actual figures taken as per True-Up Fillings

Ceiling Tariffs

Illustrative calculations

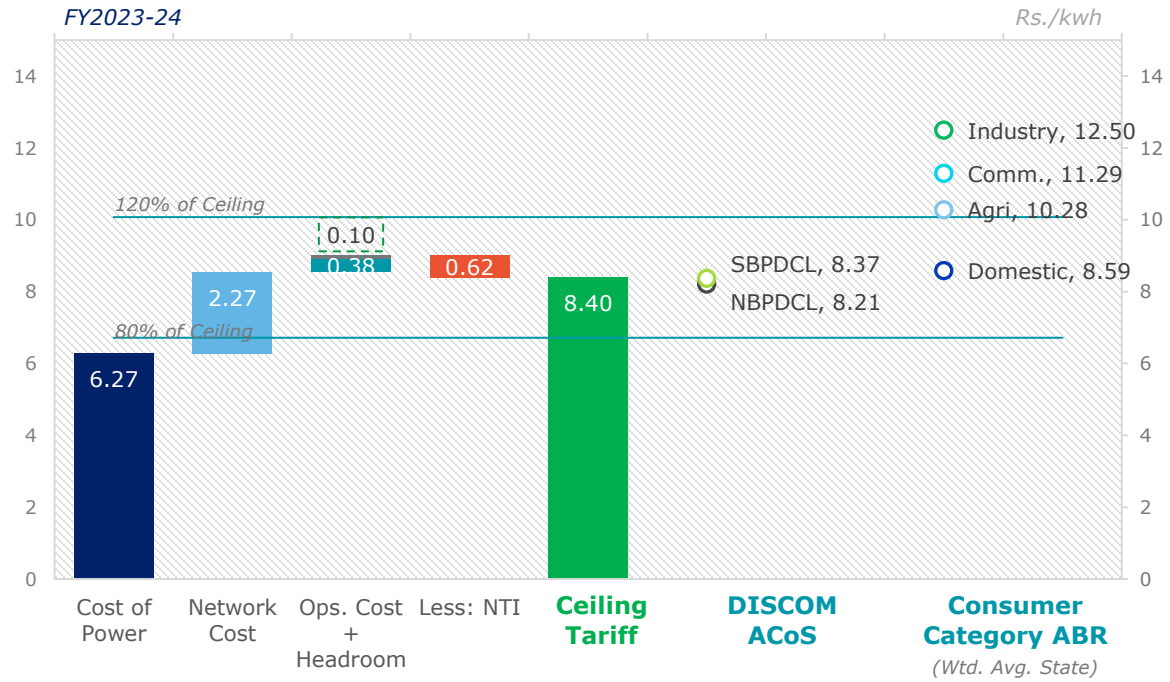
DRAFT FOR DISCUSSION

Maharashtra



- Cost of power and Operating Cost are taken as wtd. avg. of all DISCOMs; Distribution Wheeling is taken for MSEDCL
- Even with a headroom, ACOS of BEST is higher than estimated ceiling; Cross-subsidy rationalization may be required for Commercial consumer category

Bihar



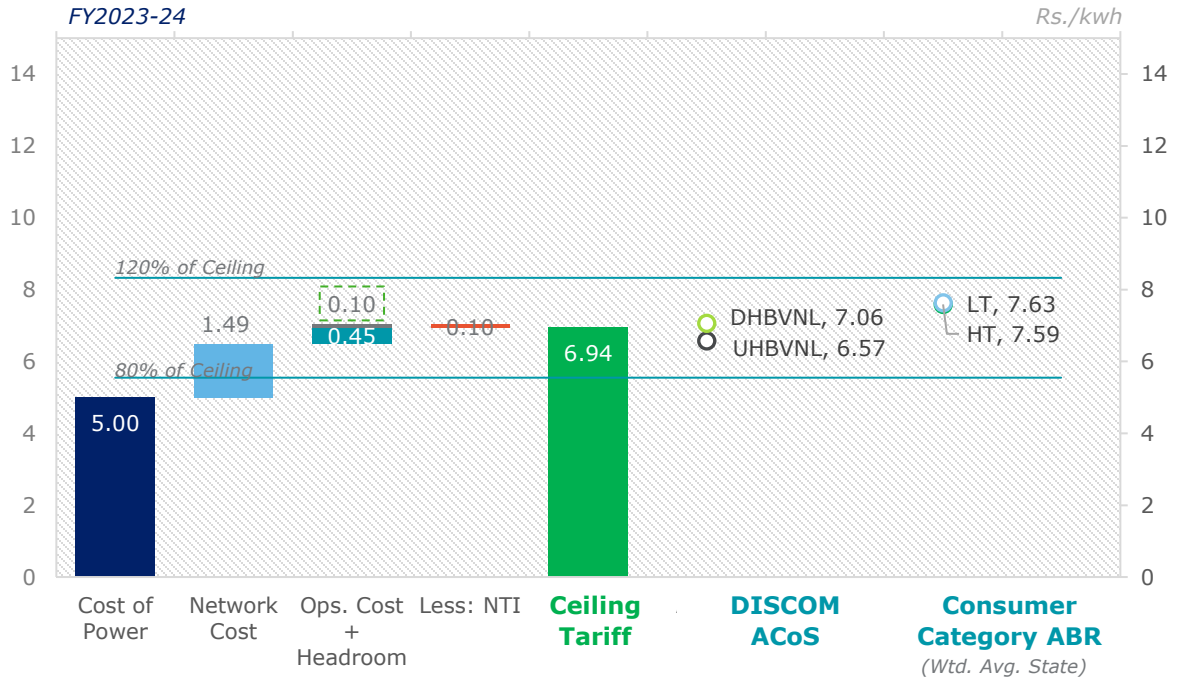
- All cost of supply elements are taken as wtd. avg. of all both DISCOMs in the state
- Category-wise ABR* of Industrial, Commercial and Agriculture consumers is more than 120% of estimated Ceiling Tariff

*full cost, without subsidy

Ceiling Tariffs

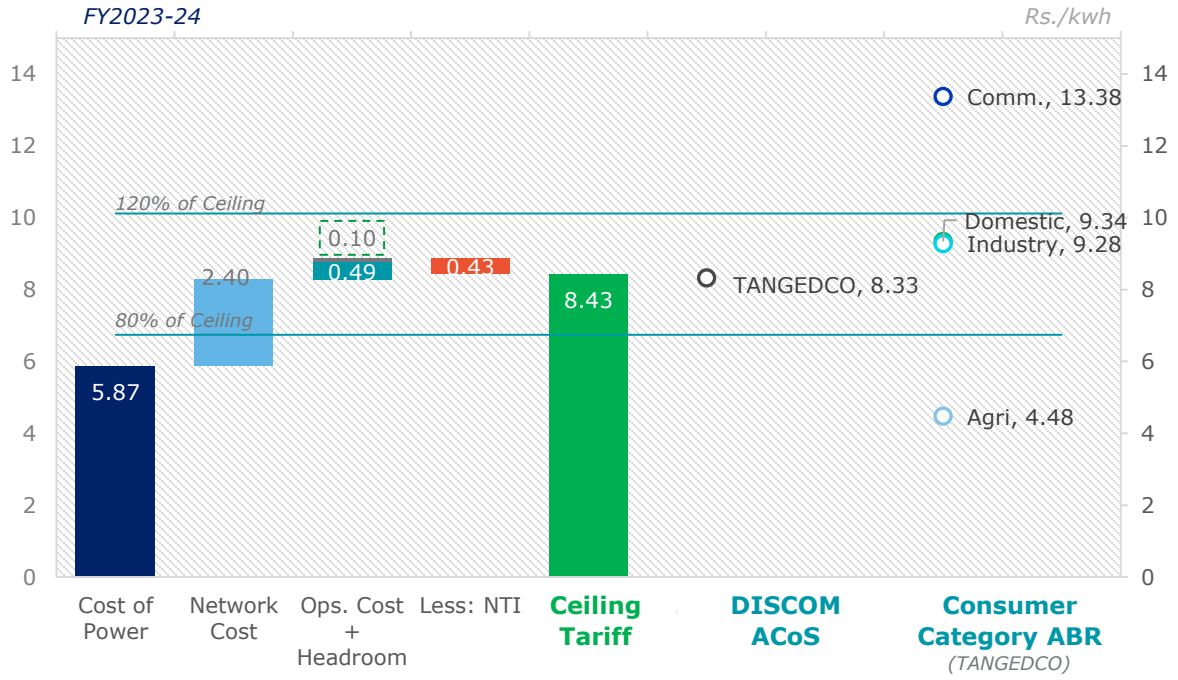
Illustrative calculations

Haryana



- All cost of supply elements are taken as wtd. avg. of both DISCOMs in the state
- Category wise ABR is well within the range of 80%-120% of estimated Ceiling Tariff; While ACOS of UHBVNL is below the estimated Ceiling Tariff, ACOS of DHBVNL is more than ceiling

Tamil Nadu



- All cost of supply elements are taken as determined by SERC for TANGEDCO
- Category-wise ABR of Commercial consumers is more than 120% of estimated Ceiling Tariff. Similarly, ABR of Agricultural consumers is below 80% of estimated Ceiling Tariff

Way Forward

Roadmap

Way forward

Key activities for enabling calculation of ceiling tariffs:

Wheeling and Supply account segregation

- Account segregation of DISCOMs into wheeling and supply business, to accurately determine the network and operating costs
- This is required so that going forward each of the cost item can be benchmarked/ indexed accordingly

Cross Subsidy rationalization

- It is observed that even after allowing a headroom, ABR of several sub-categories remain more than ceiling tariffs
- Rationalization of cross subsidy within ±20%, in line with Tariff Policy, will ensure tariffs remain below ceiling

Detailed analysis for Headroom

- Reasons for price fluctuations or uncontrollable costs may vary from state to state
- SERCs may conduct detailed analysis for DISCOMs in their respective regions to calculate an appropriate level of headroom allowance in ceiling tariffs

Subsequent Reform:

Retail Supply Competition

- Once retail supply competition is introduced, the ceiling may be determined for entire supply side cost of the business, including cost of power
- This is assuming that power markets would have developed sufficiently by then to enable suppliers to manager their costs

Impact of ceiling tariffs

On consumer tariffs and DISCOM profit margins

CONSUMERS

Consumer Category wise ABR

- Overall Ceiling Tariff may be converted into consumer category wise ABR, within a limit of ±20%
- Ceiling Tariff may be determined for broad categories of Domestic, Commercial, Agricultural and Industrial
- Tariffs of individual sub-categories/ slabs may go beyond the range of ceiling tariffs, but DISCOMs may be required to meet the ceiling on an overall category level

DISCOMS

Efficiency Margins

- DISCOMs may improve their operational efficiency and keep operating cost (supply) below ceiling, to enjoy higher returns

Allocation of Distribution Loss

- Post segregation of supply and network business for ceiling tariffs, the impact of higher/ lower than approved distribution losses, shall also have to be either segregated or allocated entirely to network business (considering majority of losses are caused by it)

Scenario	Prevailing condition	With loss allocation to Network business
1. Actual loss higher than approved	DISCOM bears the additional cost or retains the benefit, as a whole; accumulated losses funded by Govt.	1. Network Co. compensates for addl. power bought by Supply Co.
2. Actual loss less than approved		2. Network Co. may sell addl. Power or Supply Co. may compensate

Annexure

Annexures

International Review - United Kingdom

Background
For Tariff Caps

- Full retail competition was introduced into Britain's electricity retail market in 1999
- Between 2000 and 2002, the Ofgem lifted all price controls on gas and electricity, considering that competition had sufficiently developed and that a separate Competition Act was introduced in Mar 2000
- However the UK Competition and Market Authority (CMA) in its report 'Energy Market Investigation: Final Report' dated 24-Jun-2016, found that lack of consumer engagement with the energy market, gave suppliers market power over the inactive body of customers, which suppliers were then able to exploit through their pricing practices
- This paved way for the Domestic Gas and Electricity (Tariff Cap) Act 2018. The Act provides for the imposition of a cap on rates charged to domestic customers for the supply of gas and electricity in United Kingdom
- The Tariff Caps aim to protect consumers who are on Standard Variable or Default Tariffs
- Ofgem sets the level of the cap based on a broad estimate of how much it costs an efficient supplier to provide gas and/or electricity services to a customer. The Tariff Cap is updated every quarter (3 months), either reflecting changes in underlying costs or increases in inflation.

Overall methodologies

For setting Tariff Cap

Before setting the first tariff cap in November 2018, the Ofgem in its consultation paper discussed following methodologies for calculating the cap:

- x **A market basket of tariffs:** this approach proposed to set the cap using an average of market tariffs offered in the competitive segment of the market. This approach was ruled out by the Commission as it may not reflect the long-run costs of an efficient supplier. market prices will depend on suppliers' pricing strategies and the degree of competition in the market, not just their underlying costs.

- x **Adjusted version of Safeguard Tariff:** Safeguard Tariff, determined by Competition and Markets Authority (CMA) of UK, caps the prices for select type of customers which include prepayment customers and households eligible to receive Warm Home Discount. Under this approach Ofgem proposed to adjust this safeguard tariff by differential costs for serving direct debit customers and some other adjustments suggested by stakeholders, to be set as tariff cap.

- x **Updated competitive price reference approach:** under this approach, Ofgem proposed to calculate tariff cap using broad methodology used by CMA for Safeguard Tariffs, but with more recent and revised price data.

- ✓ **Bottom-up cost approach:** Under this approach, Ofgem proposed estimating efficient allowances for each cost category, and summing these together.

Tariff Cap Methodology

Cost components

Wholesale (energy) Cost, WC

+ Adjustment Allowance, AA

+ Network cost, NC

+ Policy Cost, PC

+ Operating Cost, OC

+ Payment method uplift Allowance, PA

+ Headroom Allowance, H

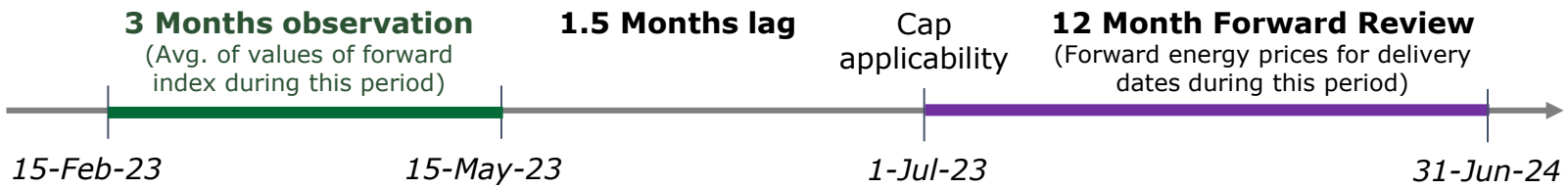
+ Earnings Before Interest & Taxes, EBIT

+ VAT

Wholesale (Energy) Cost, WC:

1. Direct Fuel Cost (DF)

- Based on Fuel Price Index (prices of forward energy products) as published by Independent Commodity Exchange Services (ICIS); weighted average price of seasonal products (30:70 for peak: baseload)
- Period of averaging:



- Adjusted for Forecasting Error, Electricity Losses, Backwardation/ hedging Cost*, CfD allowance

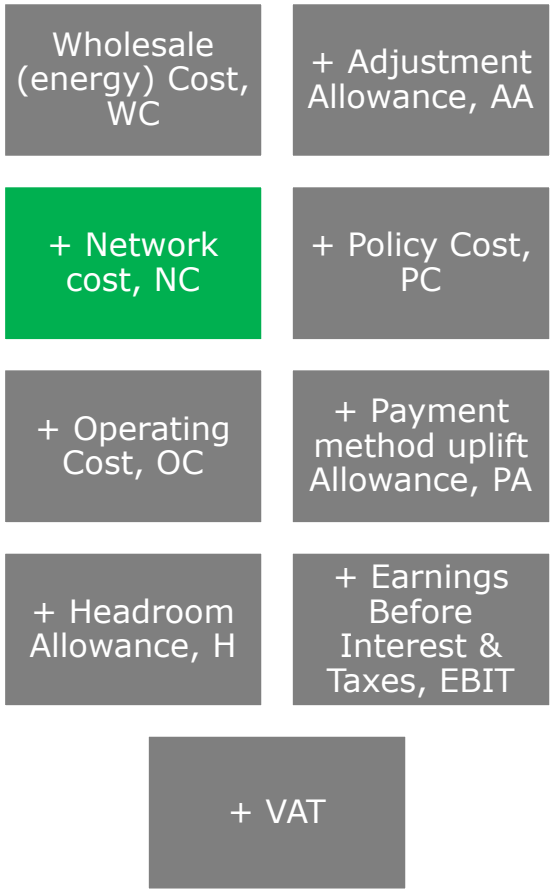
2. Capacity Market Cost (CM):

- Based on price discovered through auctions under Capacity Market Scheme as published by National Grid. The cost is divided by forecast total peak demand to derive an implied cost per peak MWh on the transmission system

** Backwardation cost: difference in cost due to mis-match in reference period (12 months) of index used and delivery period (3 months)*

Tariff Cap Methodology

Cost components



Network Cost, NC:

Wheeling charges for:

- **Transmission Network Use of System (TNUoS)**, for recovering cost of installing and maintaining transmission system; the cost is published by National Grid (operating as Electricity System Operator) annually in Pence/ Kwh, based on total allowed revenue determined by Ofgem (as per RIIO-ET2 for period 2021-2026)

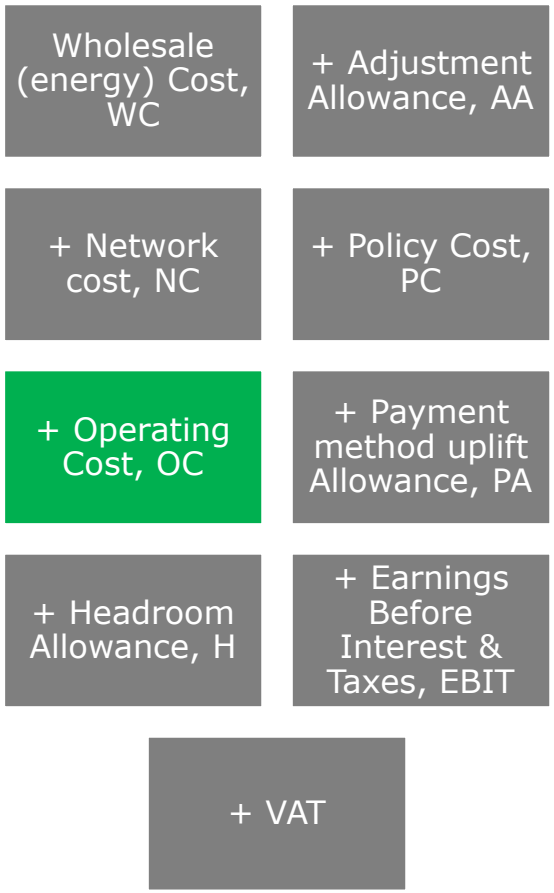
- **Distribution Use of System (DUoS),** for recovering cost of installing and maintaining distribution system; the charge consists of a per unit variable charge and a per day fixed charge; the cost is published by each of the 14 individual Distribution Network Operators (DNOs)*, based on total allowed revenue determined by Ofgem (as per RIIO-ED2 for period 2023-2028)

- **Balancing Service Use of System (BSUoS)**, amount charged for the service of balancing the transmission system, such as running the national control room, frequency response arrangements, and other ancillary services and constraint costs – recovered on an ex-post basis; Forecasts of annual BSUoS charges, published by National Grid, are used as inputs.

**following Common Distribution Charging Methodology (CDCM) as per Distribution Connection and Use of System Agreement (DCUSA)*

Tariff Cap Methodology

Cost components



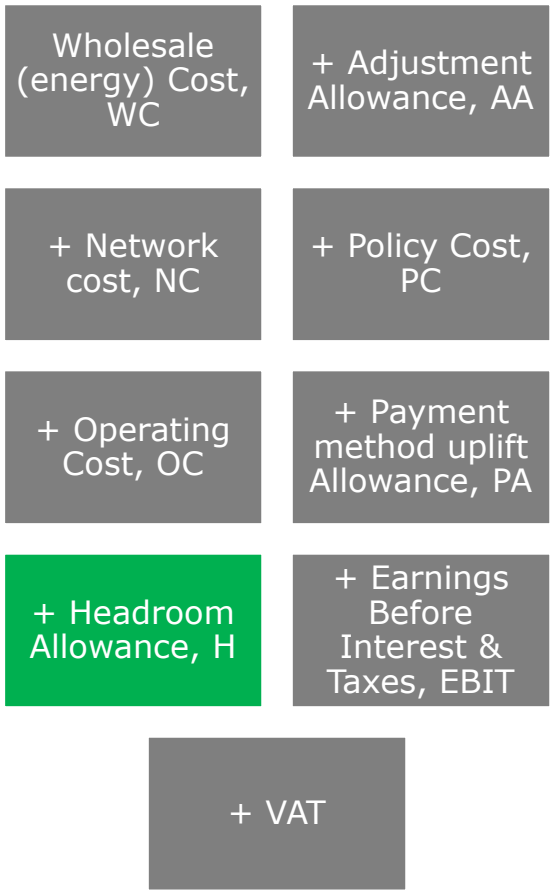
Operating Cost, OC:

- Baseline Cost, adjusted for inflation - Consumer Prices Index Including Owner Occupiers' Housing Costs (CPIH)
- Baseline costs for 1st Tariff Cap in 2018 was set using Bottom-Up approach: basis suppliers' historical costs and Ofgem's view on efficient level of these costs, as follows:
  - Determined as cost per customer account basis
  - Determined at total level, rather than breaking down into allowances for individual components of operating costs (eg metering, bad debt, customer service etc.)
  - As per the most recent financial year (i.e. 2017 for Tariff Cap, set in 2018)
  - Basis historical costs of more than 60 suppliers active in market (excluding suppliers with customer base less than 250,000, suppliers serving a niche customer base only and suppliers non-compliant on license requirements)
  - Options considered by Ofgem for Efficient level of operating costs:
    - x 'Frontier Level' = average of the two lowest cost suppliers in sample
    - x Cost of lower quartile of companies in the sample
    - ✓ Setting a benchmark in between the frontier cost and cost of lower quartile

**Ofgem require the large energy suppliers to produce audited annual CSS to show the costs, revenues and profits for the different segments of their generation and supply businesses*

Tariff Cap Methodology

Cost components



Headroom Allowance, H:

- Tariff Cap is set higher than estimate of the efficient benchmark costs. This is called additional allowance or "headroom".
- This allowance for any unidentified error or uncertainties, when:
  - Addressing the intrinsic uncertainty involved in estimating an efficient level of costs
  - Allowing efficient suppliers to manage volatile pass-through costs, particularly when purchasing energy
  - Helping with cost variation, because some efficient suppliers have costs that are higher or lower than average for reasons outside of their control (eg due to differences in their customer base)
- Headroom allowance is set as a percentage of tariff (excluding network costs)
- This headroom % is kept fixed for entire life of Tariff Caps, set at 1.46%* by Ofgem

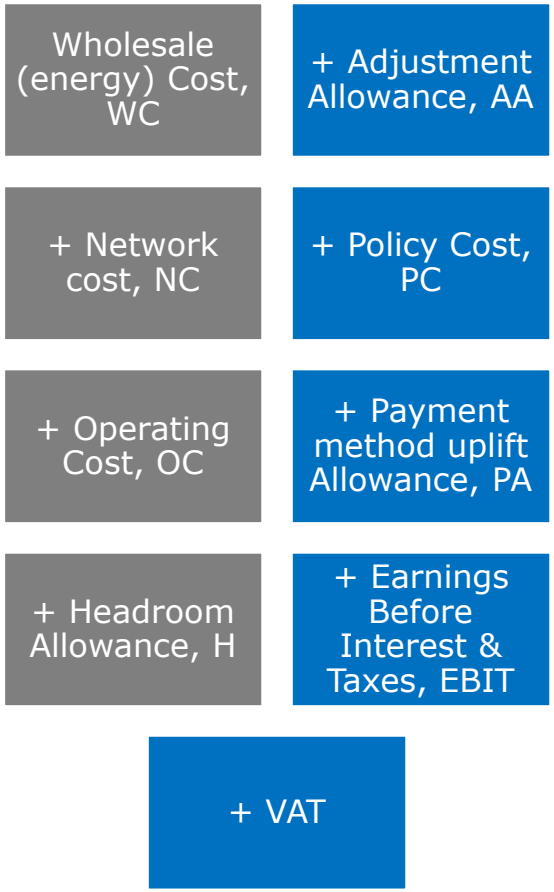
**The % was back calculated from a £10 headroom allowance (determined in 1st price cap order of 2018)*

Tariff Cap Methodology

Cost components

DRAFT FOR DISCUSSION

Back



- **Adjustment Allowance, AA:** For costs resulting from COVID-19 due to bad debts, increase in working capital requirement and debt related administrative costs
- **Policy Cost, PC:** Cost for supplier's environmental and social obligations for schemes like Renewable Obligation (RO), Feed-in-Tariff (FiT), ECO, Warm House Discount (WHD) and AAHEDC
- **Payment method uplift allowance:** reflects the additional debt and costs of supplying standard credit customers, including additional working capital costs, additional bad debt costs and additional administrative costs
- **EBIT:** Profit Margins allowed by Ofgem to suppliers, set at 1.94% by Ofgem
- **VAT:** As per prevalent tax rate

Annexures

International Review - Australia

Background

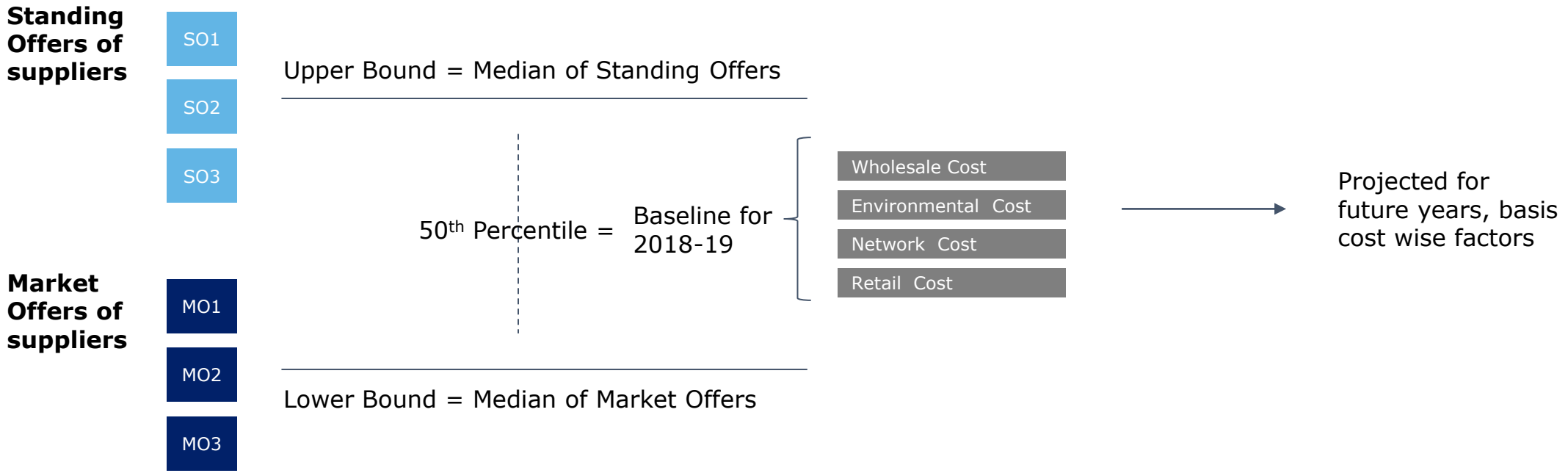
For Default Market Offers

- Full retail supply competition exists in all six regions of National Electricity Market (NEM) of Australia
- Two types of tariff scheduled are available for customers to choose from – Market Offers and Standing Offers
- Initially, retail prices were regulated; this was abolished - Victoria became the first state to abolish retail price regulation in 2009, followed by South Australia (2013), NSW (2014) and South East Queensland (2016)
- However on 11-July-2018, the Australian Competition & Consumer Commission (ACCC) published a report 'Retail Electricity Pricing Inquiry report'. In this report, the ACCC noted that high electricity prices and bills have placed enormous strain on household budgets and business viability.
- To resolve this, ACCC suggested abolishing the current retail 'standing' offers (which are not the same between retailers) and replacing them with a new 'default' offer consistent across all retailers.
- Accordingly, as per Section 10 and Section 16 of The Competition and Consumer (Industry Code—Electricity Retail) Regulations 2019, the Australian Energy Regulatory (AER) determines annually, a Default Market Offer (DMO) as the maximum price (or 'price cap') that a retailer can charge a customer
- The price cap is set each year by the regulator and it comes into effect on July 1st each year

Overall methodology

For setting Tariff Cap

- AER in its first DMO order for 2019-20, determined the tariff cap using a 'Top-Down' Approach
- This approach used publicly available information of Market Offers and Standing offers of various suppliers, and set the DMO as somewhere in between these tariffs, as follows:



Default Market Offers - Methodology

Cost Components

Wholesale Cost

+ Energy Loss Factor

+Environmental Cost

+ Network Cost

+ Retail Cost

Wholesale Cost

- Wholesale energy costs are estimated based on market simulations to calculate expected spot market costs and volatility, and the hedging of the spot market price risk
- Other Wholesale Costs include National Electricity Market (NEM) fees, ancillary services charges, Reliability and Emergency Reserve Trader (RERT) costs, AEMO direction costs, and costs of meeting prudential requirements

Energy Loss Factor

- Distribution Loss Factors (DLF) for each jurisdiction and average Marginal Loss Factors (MLF) for transmission losses from the node to major supply points in the distribution networks are applied to incorporate losses
- MLFs and DLFs are published by AEMO annually

Default Market Offers - Methodology

Cost Components

Wholesale Cost

+ Energy Loss Factor

+Environmental Cost

+ Network Cost

+ Retail Cost

Environmental Costs

- Large Scale Renewable Energy Target (LRET):
  - Clean Energy Regulator (CER) publishes the Renewable Power Percentage (RPP), which requires power distribution companies to purchase Large-scale Generation Certificates (LGCs)
  - Estimated cost of compliance is derived by multiplying the RPP and the determined LGC price
  - Average LGC price is determined using a market based approach, that estimates forward prices for the two relevant compliance years
- Small Scale Renewable Energy Scheme (SRES):
  - Similar to LRET, CER publishes the Small-scale Technology Percentage (STP), that translates into the required Small-scale Technology Certificates (STCs) to be purchased as a percentage of the estimated volume of electricity consumption
  - Cost of STC is taken as per CER's clearing house price for the year of default tariff determination
- Other Environmental Cost include cost of compliance for other schemes such as New South Wales Energy Savings Scheme (ESS), New South Wales Peak Demand Reduction Scheme (ESS), South Australia Retailer Energy Productivity Scheme etc.

Default Market Offers - Methodology

Cost Components

Wholesale Cost

+ Energy Loss Factor

+Environmental Cost

+ Network Cost

+ Retail Cost

Network Costs

- AER uses approved network tariffs as determined under separate tariff orders (for each regulatory control period for each distribution company) for calculation of DMO
- NUOS charge consist of following:
  - Network Access Charge
  - Energy Consumption Charge
  - Demand Charge
  - Capacity Charge

Retail Costs

- AER determines the retail operating costs by applying Consumer Price Inflation on baseline costs
- Retail costs include:
  - Cost to serve
  - Costs to acquire and retain customers
  - Depreciation Amortization
  - Advanced Meter cost
  - Bad & doubtful debt

Annexures

Illustrative Ceiling Tariffs – Maharashtra

Maharashtra – Illustrative Ceiling Tariffs

DRAFT FOR DISCUSSION

Headroom in Operating Cost (Supply) - Variation in past Trued-Up Years

Back

All figures in Rs. Cr. unless specified

	FY20			FY21			FY22		
Particulars	MYT	True-up Filed	Trued-up approved	MYT	True-up Filed	Trued-up approved	MYT	True-up Filed	Trued-up approved
O&M expenses	3,332	3,351	3,326	3,390	3,365	3,305	3,304	3,577	3,514
Depreciation	311	290	271	333	378	378	357	341	339
Interest on Loan Capital	144	143	139	145	129	127	149	114	113
Interest on Working Capital	25	18	2	15	2,207	0	15	11	1
Interest on Consumer SD	816	772	772	544	302	301	571	367	367
Other Finance Charges	3	2	2	0	30	30	0	41	41
Provision for bad debts	678	785	549	678	441	441	678	430	430
Other Expenses	101	130	97	97	158	61	101	709	471
Income Tax	847	723	651	0	0	0	0	0	0
Incentives/Discounts	307	337	337	322	307	307	339	367	367
Contingency reserves	17	15	15	18	18	2	20	20	2
Return on Equity Capital	259	264	263	291	271	260	311	314	300
RLC refund	2	2	2	0	0	0	0	0	0
ASC refund	0	0	0	0	0	0	0	12	12
Past Period Surplus	853	853	853	0	0	0	0	0	0
Revenue Gap Recover	2,563	2,563	2,563	755	755	755	2,679	2,679	2,679
Impact of payment to MPECS	40	40	40	37	37	37	34	34	34
Opex scheme	0	0	0	26	18	18	26	23	23
Incremental Consumption Rebate	0	0	0	440	337	337	549	546	546
Standby Charges	99	99	99	100	100	100	100	100	100
DSM Expenses	1	1	1	1	0	0	1	1	1
Other Finance Charges	0	2	2	0	0	0	0	0	0
PF impact due to SC Judgment	0	0	0	0	0	0	0	0	0
Forex rate variation	0	0	0	0	0	0	0	0	0
Refinancing Charges	0	1	1	0	0	0	0	0	0
PV of interest cost saving	0	-1	-1	0	0	0	0	0	0
Payment to TPC-G	0	0	0	88	53	53	0	0	0
True-up Gap/(surplus) of AEMl-G	0	0	0	-92	-92	-92	0	0	0
Less: Non-tariff income	454	578	578	474	358	358	496	1,285	1,285
Total	9,944	9,813	9,407	6,715	8,457	6,063	8,737	8,402	8,056
Energy Sales (MUs)	119,860	121,242	116,264	133,621	124,647	117,924	138,480	138,771	130,004
Operating Cost (Supply), Rs./Kwh	0.83	0.81	0.81	0.50	0.68	0.51	0.63	0.61	0.62

Maharashtra – Illustrative Ceiling Tariffs

Headroom in Operating Cost (Supply) - Trend/ Assumptions of cost escalations in various factors

Bad Debt provisioning

Not applicable; Bad Debt Provisioning already built into ARR by SERC

O&M Expense

		FY20				FY21				FY22			
Particulars	Units	MYT	True-up Filling	Trued-up	Variation	MYT	True-up Filling	Trued-up	Variation	MYT	True-up Filling	Trued-up	Variation
		A	*B*	*C*	C-A	A	*B*	*C*	C-A	A	*B*	*C*	C-A
MSEDCL	Rs. Cr.	2,612	2,631	2,620	7	*2,650*	2,624	2,582	-68	2,540	2,782	2,738	198
TPC-D	Rs. Cr.	97	10	10	-87	*112*	108	107	-5	11	19	19	9
AEML	Rs. Cr.	203	189	189	-14	*198*	207	207	9	204	223	223	20
BEST	Rs. Cr.	420	429	416	-4	*430*	426	409	-21	444	456	437	-7
Total	Rs. Cr.	3,332	*3,259*	*3,234*	*0*	3,390	*3,365*	*3,305*	*0*	3,199	*3,481*	*3,418*	*219*
Variation	%				*0%*				*0%*				*7%*

Avg. Variation of FY20 to FY22	A	%	2%
Multiplication Factor	B	%	3%
Headroom	C=A*B*Operating Cost (Supply)	Rs./kwh	0.0006

*Multiplication factor is calculated as share of O&M Expense in ARR (excl. PPC) * Share of Operating cost in total cost of supply*

Maharashtra – Illustrative Ceiling Tariffs

Headroom in Operating Cost (Supply) - Trend/ Assumptions of cost escalations in various factors

Additional Capital Expenditure

		FY20				FY21				FY22			
Particulars	Units	MYT	True-up Filling	Trued-up	Variation	MYT	True-up Filling	Trued-up	Variation	MYT	True-up Filling	Trued-up	Variation
Capitalization during year		A	*B*	*C*	C-A	A	C	D	D-A	A	*B*	*C*	C-A
MSEDCL	Rs. Cr.	5,920	4,444	4,421	-1,499	5,385	4,492	4,485	-900	3,639	3,442	3,909	270
TPC-D	Rs. Cr.	131	161	161	30	165	175	175	10	158	176	176	17
AEML	Rs. Cr.	180	243	239	59	78	136	136	59	71	123	108	37
BEST	Rs. Cr.	683	713	706	23	760	1,001	1,001	241	607	1,047	1,008	401
Total	Rs. Cr.	**6,914**	**5,562**	**5,527**	**-1,387**	**6,388**	**5,804**	**5,797**	**-591**	**4,475**	**4,788**	**5,202**	**726**
Variation – CAPEX	%				*0%*				*0%*				*16%*

Avg. Variation of FY20 to FY22	A1	%	5%	
Assumption for CAPEX variation	A2	%	10%	
CAPEX Impact				***A2*Impact Items***
Depreciation Rate	B1	%	4.56%	0.46%
Interest Rate	B2	%	9.85%	0.99%
ROE	B3	%	15.50%	1.55%
Total	B			2.99%
Multiplication Factor	C	Ratio	0.01	
Headroom	C=A*B*Operating Cost (Supply)	Rs./Kwh	0.0004	

*Multiplication factor is calculated as share of Dep.+Interest+ROE Expense in ARR (excl. PPC) * Share of operating cost in total cost of supply*

Annexure – Maharashtra

Illustrative Ceiling Tariffs

Cost of Power

FY 2023-24	MSEDCL		TPC-D		AEML		BEST		Overall	
Particulars	Mix	Rate	Mix	Rate	Mix	Rate	Mix	Rate	Mix	Rate
Source Type	%	Rs./Kwh	%	Rs./Kwh	%	Rs./Kwh	%	Rs./Kwh	%	Rs./Kwh
Thermal	75%	4.93	58%	7.38	28%	5.38	63%	7.10	71%	5.07
Hydro	4%	2.32	0%	0.00	15%	3.24	15%	4.35	5%	2.72
Solar	10%	3.44	17%	3.06	46%	4.45	9%	5.15	13%	3.71
Non-Solar	11%	5.03	18%	4.50	5%	5.00	10%	4.90	11%	5.00
ST	0%	0.00	6%	5.13	6%	5.13	4%	7.43	1%	5.48
Total, Ex-Bus		**4.70**		**5.97**		**4.60**		**6.32**		**4.79**
CTU Loss		3.55%		3.55%		3.55%		3.55%		3.55%
STU Loss		3.18%		3.18%		3.18%		3.18%		3.18%
Dist. Loss		13.00%		1.02%		6.80%		4.18%		13.00%
Cost of Power (A)		**5.55**		**6.20**		**4.89**		**6.79**		**5.57**

FY 2024-25	MSEDCL		TPC-D		AEML		BEST		Overall	
Particulars	Mix	Rate	Mix	Rate	Mix	Rate	Mix	Rate	Mix	Rate
Source Type	%	Rs./Kwh	%	Rs./Kwh	%	Rs./Kwh	%	Rs./Kwh	%	Rs./Kwh
Thermal	73%	5.01	63%	7.40	34%	5.11	59%	7.24	69%	5.14
Hydro	3%	2.35	0%	0.00	14%	3.24	0%	4.43	4%	2.75
Solar	13%	3.38	16%	3.06	45%	4.40	25%	4.62	16%	3.61
Non-Solar	11%	4.96	0%	3.71	0%	5.60	10%	4.69	10%	4.93
ST	0%	0.00	21%	5.13	8%	5.13	6%	5.13	1%	5.13
Total, Ex-Bus		**4.70**		**5.98**		**4.54**		**6.17**		**4.78**
CTU Loss		3.55%		3.55%		3.55%		3.55%		3.55%
STU Loss		3.18%		3.18%		3.18%		3.18%		3.18%
Dist. Loss		12.00%		1.02%		6.55%		4.18%		12.00%
Cost of Power (A)		5.49		6.21		4.67		6.63		5.49

Annexure – Maharashtra

Illustrative Ceiling Tariffs

Transmission Charges

- Transmission charges approved by the Commission for FY 2023-24 and FY 2024-25 (as per Tariff Order) are used for calculation of illustrative ceiling tariffs
- Approved Inter-state transmission (CTU) charges for MSEDCL are considered for calculation of illustrative ceiling tariffs, as this cost of per unit basis shall be similar for all DISCOMs in the state; For Intra-state transmission (STU) charges, sum of approved costs of all DISCOMs in the state is considered as the total STU cost is allocated among DISCOMs in the state.

Particulars	Units	MSEDCL	TPC-D	AEML	BEST	Overall (Wtd. Avg.)
Inter-State Transmission						
CTU expense	Rs. Cr.	3,845	NA	NA	NA	3,845
Energy Sales	MUs	123,955	NA	NA	NA	3,845
CTU Charge	Rs./Kwh					0.31
Intra-State Transmission						
STU expense	Rs. Cr.	8,594	278	492	233	9,597
Energy Sales	MUs	123,955	3,994	12,455	4,787	145,190
STU Charge	Rs./Kwh					0.66
Transmission Charge	Rs./Kwh					**0.97**

Particulars	Units	MSEDCL	TPC-D	AEML	BEST	Overall (Wtd. Avg.)
Inter-State Transmission						
CTU expense	Rs. Cr.	4,037	NA	NA	NA	4,037
Energy Sales	MUs	126,805	NA	NA	NA	4,037
CTU Charge	Rs./Kwh					0.32
Intra-State Transmission						
STU expense	Rs. Cr.	8,639	331	590	300	9,860
Energy Sales	MUs	126,805	4,247	13,295	5,038	149,385
STU Charge	Rs./Kwh					0.66
Transmission Charge	Rs./Kwh					**0.98**

Annexure – Maharashtra

Illustrative Ceiling Tariffs

Distribution Wheeling Charge

MERC in its tariff orders for DISCOMs, calculates ARR for Wires and Supply businesses separately, based on separate cost projections for various ARR components. The Commission determines three part tariffs for each utility – Fixed monthly charges, per unit energy charges and per unit wheeling charges. The per unit wheeling charges are determined based on wheeling ARR of the utility. Accordingly, wheeling charge determined by the Commission, for the DISCOM with most expansive network in the state i.e. MSEDCL, is considered for distribution wheeling charge in illustrative Ceiling Tariffs

Particulars (FY 2024)	**Units**	**MSEDCL**	**TPC-D**	**AEML**	**BEST**	**Overall (MSEDCL)**
Distribution Wheeling Charge						
• HT	Rs/Kwh	0.60	0.99	1.00	0.68	0.60
• **LT**	**Rs/Kwh**	**1.17**	**1.68**	**2.21**	**1.74**	**1.17**
Particulars (FY 2025)	**Units**	**MSEDCL**	TPC-D	**AEML**	**BEST**	**Overall (MSEDCL)**
Distribution Wheeling Charge						
• HT	Rs/Kwh	0.60	1.22	1.17	0.77	0.60
• **LT**	**Rs/Kwh**	**1.17**	**2.03**	**2.60**	**1.97**	**1.17**

Operating (Supply) Charge

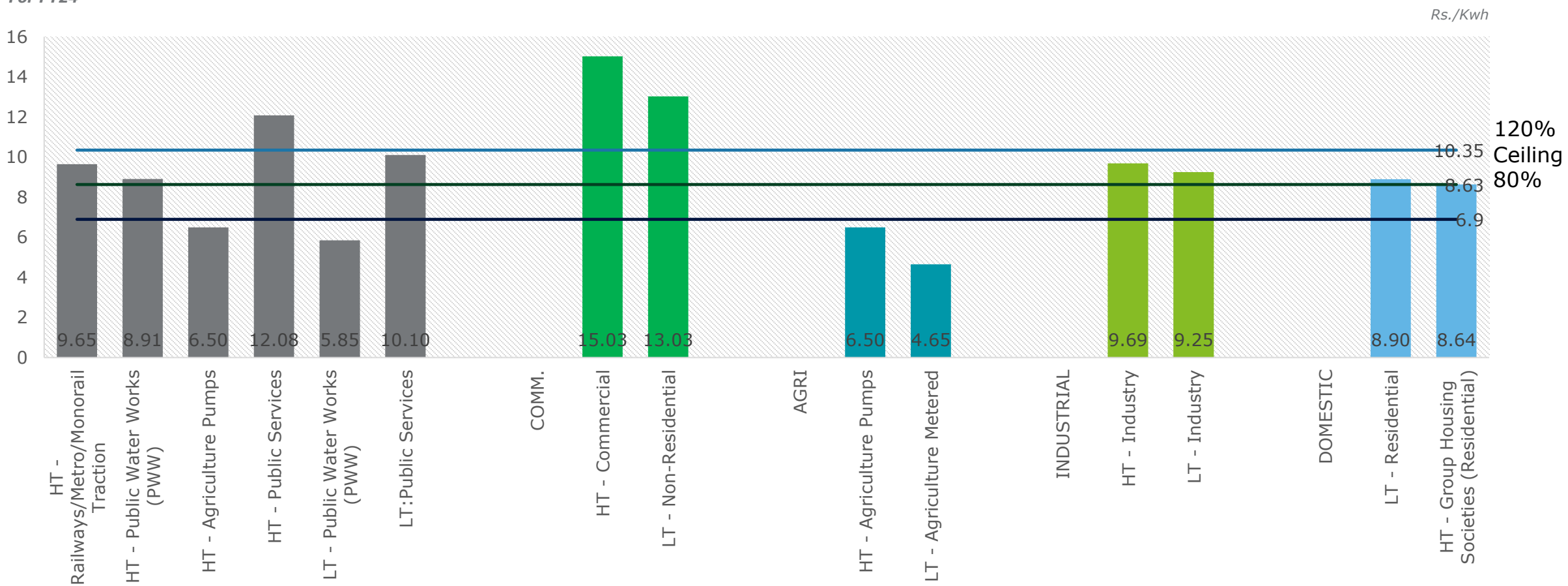
Particulars (FY 2024)	**Units**	**MSEDCL**	**TPC-D**	**AEML**	**BEST**	**Overall (Wtd Avg)**
Supply Business ARR Less Power Purchase Cost	Rs. Cr.	11264	317	624	315	12514
Energy Sales	MUs	123955	3994	12455	4787	145190
Operating Cost (Supply)	**Rs./Kwh**	**0.91**	**0.79**	**0.50**	**0.66**	**0.86**
Particulars (FY 2025)	**Units**	**MSEDCL**	**TPC-D**	**AEML**	**BEST**	**Overall (Wtd Ayg)**
Supply Business ARR Less Power Purchase Cost	Rs. Cr.	12931	306	661	326	14224
Energy Sales	MUs	126805	4247	13295	5038	149385
Operating Cost (Supply)	**Rs./Kwh**	**1.02**	**0.72**	**0.50**	**0.65**	**0.95**

Maharashtra

Illustrative Ceiling Tariffs

Impact on DISCOMs/ Consumers

For FY24

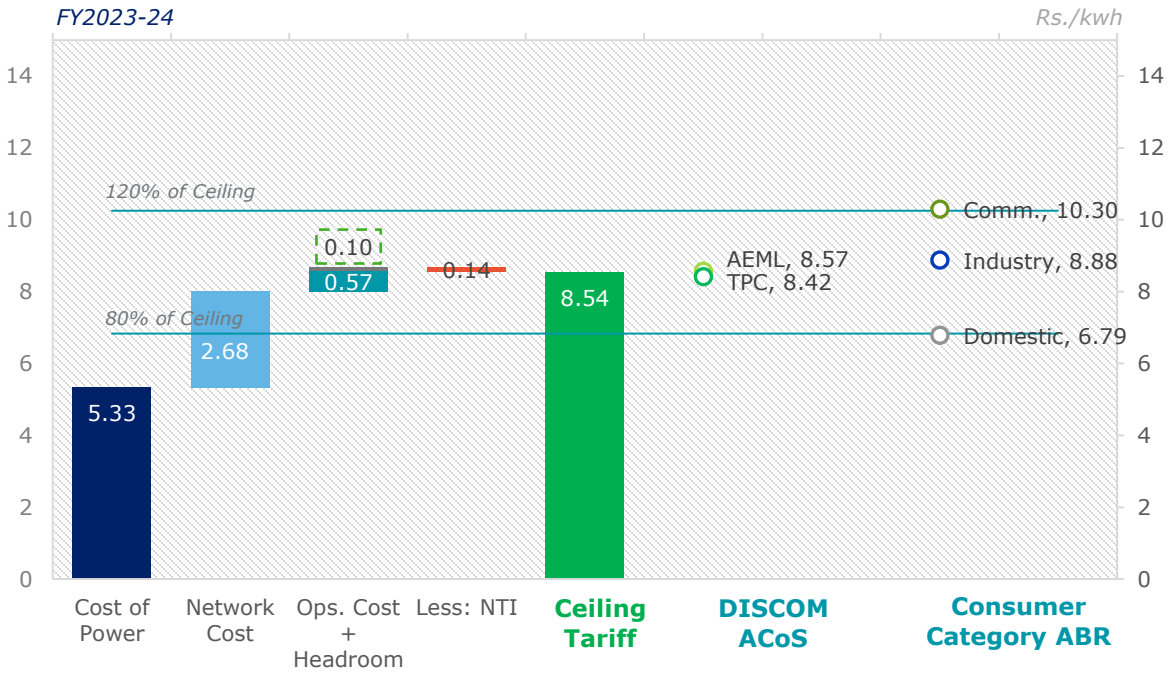


Ceiling Tariffs

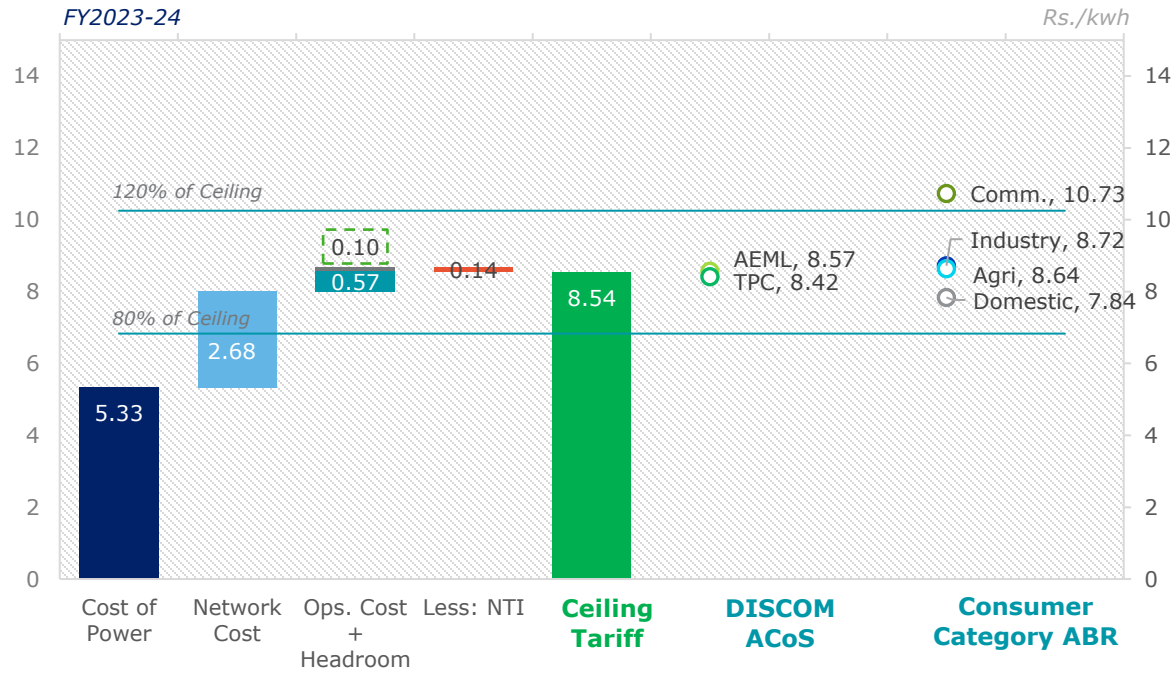
Illustrative calculations

DRAFT FOR DISCUSSION

Mumbai-TATA



Mumbai-Adani



*full cost, without subsidy

Annexures

Illustrative Ceiling Tariffs - Bihar

Bihar – Illustrative Ceiling Tariffs

DRAFT FOR DISCUSSION

Headroom in Operating Cost (Supply) - Variation in past Trued-Up Years

Back

All figures in Rs. Cr. unless specified

		FY20								FY21								FY22							
		MYT		Tariff Order		True-up Filed		Trued-up approved		MYT		Tariff Order		True-up Filed		Trued-up approved		MYT		Tariff Order		True-up Filed		Trued-up approved	
Particular	Supply Share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share
Employee cost	40%	789	316	789	316	957	383	874	350	933	373	842	337	946	378	940	376	1,104	442	985	394	1,076	431	1,053	421
R&M Expenses	10%	415	42	415	42	295	29	339	34	528	53	405	40	407	41	447	45	599	60	467	47	507	51	545	55
A&G Expenses	50%	270	135	270	135	322	161	261	130	297	148	288	144	277	138	277	138	326	163	305	153	351	175	293	146
Holding Co. exp.	40%	22	9	22	9	44	18	44	18	22	9	39	16	32	13	32	13	22	9	49	20	46	19	46	19
Depreciation	10%	421	42	421	42	437	44	347	35	539	54	386	39	610	61	459	46	610	61	473	47	606	61	541	54
Interest on loans	10%	780	78	780	78	477	48	488	49	1,007	101	567	57	660	66	649	65	1,109	111	618	62	861	86	798	80
Other finance ch.	90%	81	73	81	73	93	83	93	83	89	80	119	107	92	83	92	83	98	88	124	111	185	167	106	95
Return on Equity	10%	803	80	803	80	424	42	404	40	1,034	103	460	46	524	52	503	50	1,169	117	516	52	658	66	600	60
Interest on SD	100%	67	67	67	67	24	24	24	24	75	75	58	58	19	19	19	19	84	84	51	51	20	20	20	20
Interest on WC	90%	47	42	47	42	35	31	30	27	70	63	46	41	22	19	19	17	82	74	37	34	77	70	0	0
Cont. Reserve	0%	120	0	0	0	0	0	0	0	157	0	0	0	0	0	0	0	180	0	0	0	0	0	0	0
Less: NTI	0%	684	0	684	0	907	0	1,138	0	704	0	813	0	695	0	837	0	782	0	615	0	997	0	936	0
Total		3,012	884	3,012	884	2,199	863	1,765	789	3,890	1,060	2,396	885	2,893	871	2,601	852	4,422	1,209	3,009	969	3,390	1,143	3,065	949
Energy Sales	MUs		27,513				22,674		22,553		30,846				24,342		24,208		34,567				31,374		26,525
Operating Cost (Supply)	Rs./kwh		0.32				0.38		0.35		0.34				0.36		0.35		0.35				0.364		0.358

Bihar – Illustrative Ceiling Tariffs

Headroom in Operating Cost (Supply) - Trend/ Assumptions of cost escalations in various factors

Bad Debt provisioning

Particulars	Items	Units	FY24
Cost of Supply	A	Rs./Unit	8.30
Margin	B	%	1.50%
Cost of Supply, post Margin	C=A/(1-B)	Rs./Unit	8.42
Headroom	D=C-A	Rs./Unit	0.13

O&M Expense

		FY20					FY21					FY22				
Particulars	Units	MYT	Tariff Order	True-up Filling	Trued-up	Variation	MYT	Tariff Order	True-up Filling	Trued-up	Variation	MYT	Tariff Order	True-up Filling	Trued-up	Variation
		A	B	C	D	D-A	A	B	C	D	D-A	A	B	C	D	D-A
Employee cost	Rs. Cr.	316	316	383	350	34	373	337	378	376	3	442	394	431	421	-20
R&M Expenses	Rs. Cr.	42	42	29	34	-8	53	40	41	45	-8	60	47	51	55	-5
A&G Expenses	Rs. Cr.	135	135	161	130	-5	148	144	138	138	-10	163	153	175	146	-17
Holding Co. exp.	Rs. Cr.	9	9	18	18	9	9	16	13	13	4	9	20	19	19	10
Total	Rs. Cr.	501	501	591	532	30	583	537	570	572	0	673	613	675	641	0
Variation	%					6%					0%					0%

Avg. Variation of FY20 to FY22	A	%	2%
Multiplication Factor	B	%	3%
Headroom	C=A*B*Operating Cost (Supply)	Rs./kwh	0.0003

*Multiplication factor is calculated as share of O&M Expense in ARR (excl. PPC) * Share of Operating cost in total cost of supply*

Bihar – Illustrative Ceiling Tariffs

Headroom in Operating Cost (Supply) - Trend/ Assumptions of cost escalations in various factors

Additional Capital Expenditure

		FY20					FY21					FY22				
Particulars	Units	MYT	Tariff Order	True-up Filling	Trued-up	Variation	MYT	Tariff Order	True-up Filling	Trued-up	Variation	MYT	Tariff Order	True-up Filling	Trued-up	Variation
		A	B	C	D	D-A	A	B	C	D	D-A	A	B	C	D	D-A
GFA	Rs. Cr.	33,780		24,350	26,419	0	38,514		30,133	31,741	0	40,273		37,835	36,430	0
Capitalization during year	Rs. Cr.	7,248		6,122	5,877	0	2,668		5,783	5,566	2,898	2,050		8,322	4,845	2,795
Variation - GFA	%					0%					0%					0%
Variation - CAPEX	%					0%					109%					136%

Avg. Variation of FY20 to FY22	A1	%	82%	
Assumption for CAPEX variation	A2	%	10%	
CAPEX Impact				***A2*Impact Items***
Depreciation Rate	B1	%	4.20%	0.42%
Interest Rate	B2	%	10.17%	1.02%
ROE	B3	%	15.50%	1.55%
Total	B			2.99%
Multiplication Factor	C	Ratio	0.04	
Headroom	C=A*B*Operating Cost (Supply)	Rs./Kwh	0.0005	

*Multiplication factor is calculated as share of Dep.+Interest+ROE Expense in ARR (excl. PPC) * Share of operating cost in total cost of supply*

Bihar – Illustrative Ceiling Tariffs

DRAFT FOR DISCUSSION

Distribution Wheeling Charge and Supply Charge for FY24 and FY25

Back

Distribution Wheeling Charge

		FY 2023-24		FY 2024-25	
Particular	**Allocation: Wires share**	**Total ARR**	**Wires ARR**	**Total ARR**	**Wires ARR**
O&M Expense		Rs. Cr.	Rs. Cr.	Rs. Cr.	Rs. Cr.
Employee cost	60%	1,192	715	1,226	736
R&M Expenses	90%	539	485	530	477
A&G Expenses	50%	374	187	339	170
Holding Co. exp.	60%	52	31	37	22
Depreciation	90%	727	654	701	631
Interest on loans	90%	991	892	844	760
Other finance charges	10%	128	13	135	14
Return on Equity	90%	792	712	751	676
Interest on SD	0%	64	0	57	0
Interest on WC	10%	0	0	53	5
Total		**Rs. Cr.**	**3,689**	**Rs. Cr.**	**3,489**
Energy Sales		MUs	30,948	MUs	35,625
Distribution Wheeling Charge		**Rs./Kwh**	**1.19**	**Rs./Kwh**	**0.98**

Operating (Supply) Charge

		FY 2023-24		FY 2024-25	
Particular	**Allocation: Wires share**	**Total ARR**	**Wires ARR**	**Total ARR**	**Wires ARR**
O&M Expense		Rs. Cr.	Rs. Cr.	Rs. Cr.	Rs. Cr.
Employee cost	40%	1,192	477	1,226	490
R&M Expenses	10%	539	54	530	53
A&G Expenses	50%	374	187	339	170
Holding Co. exp.	40%	52	21	37	15
Depreciation	10%	727	73	701	70
Interest on loans	10%	991	99	844	84
Other finance charges	90%	128	115	135	122
Return on Equity	10%	792	79	751	75
Interest on SD	0%	64	64	57	57
Interest on WC	90%	0	0	53	48
Total		Rs. Cr.	**1,169**	Rs. Cr.	**1,183**
Energy Sales		MUs	30,948	MUs	35,625
Operating (Supply) Charge		**Rs./Kwh**	**0.38**	**Rs./Kwh**	**0.33**

Bihar

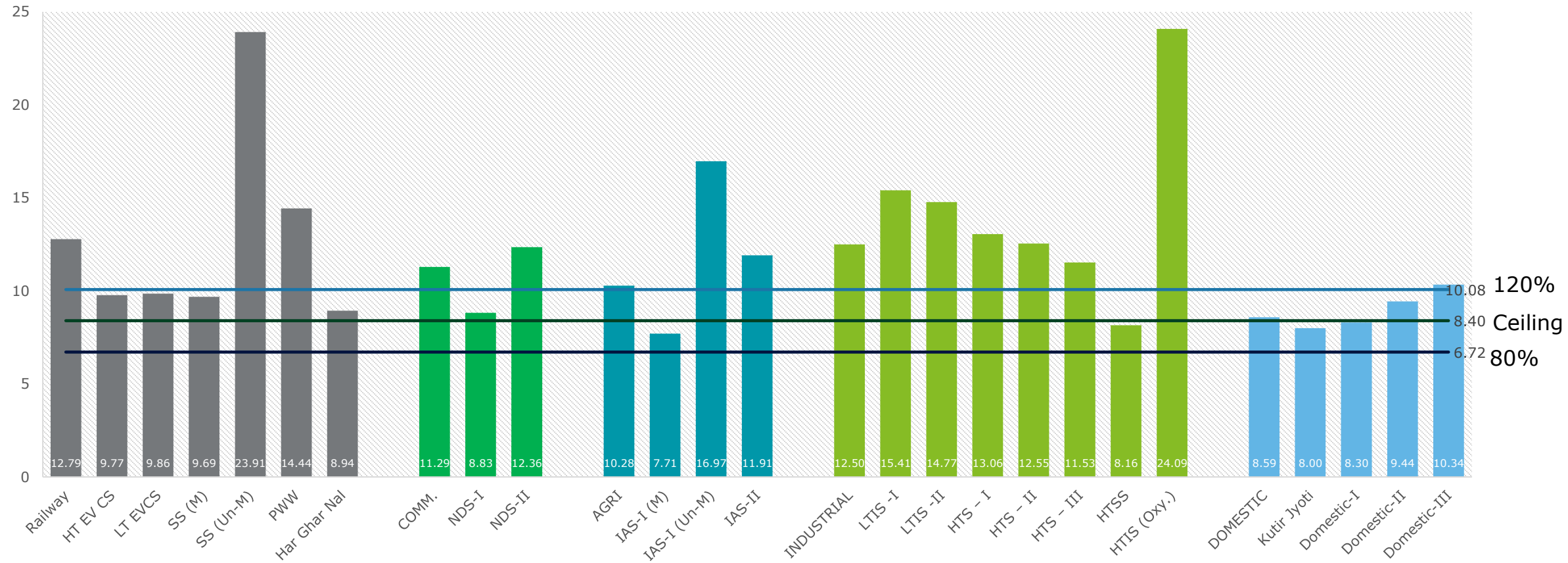
Illustrative Ceiling Tariffs

DRAFT FOR DISCUSSION

Back

Impact on DISCOMs/ Consumers

For FY24



Annexures

Illustrative Ceiling Tariffs - Haryana

Haryana – Illustrative Ceiling Tariffs

DRAFT FOR DISCUSSION

Headroom in Operating Cost (Supply) - Variation in past Trued-Up Years

Back

All figures in Rs. Cr. unless specified

		FY20			FY21			FY22		
Particular		Tariff Order	True-up Filed	Trued-up approved	Tariff Order	True-up Filed	Trued-up approved	Tariff Order	True-up Filed	Trued-up approved
Total ARR	Rs. Cr.	29,472	31,706	30,483	28,365	28,588	27,509	30,516	32,840	32,671
Less: PPC inc trans.	Rs. Cr.	24,736	26,561	26,085	24,053	23,623	23,362	25,367	27,359	27,286
Less: Dist. Wheeling Exp.	Rs. Cr.	2,818	3,031	2,914	2,712	2,733	2,630	2,917	3,140	3,123
Less: Non-tariff income	0%	0	0	0	0	0	0	0	0	0
Total		**1,918**	**2,114**	**1,484**	**1,601**	**2,232**	**1,517**	**2,231**	**2,341**	**2,262**
Energy Sales	MUs	41,786	41,847	41,847	37,177	41,856	41,856	44,143	45,357	45,357
Operating Cost (Supply)	Rs./Unit	0.46	0.51	0.35	0.43	0.53	0.46	0.51	0.52	0.50

Haryana – Illustrative Ceiling Tariffs

Headroom in Operating Cost (Supply) - Trend/ Assumptions of cost escalations in various factors

Bad Debt provisioning

Particulars	Items	Units	FY24
Cost of Supply	A	Rs./Unit	6.84
Margin	B	%	0.50%
Cost of Supply, post Margin	C=A/(1-B)	Rs./Unit	6.88
Headroom	D=C-A	Rs./Unit	0.03

O&M Expense

		FY20					FY21					FY22				
Particulars	Units	MYT	Tariff Order	True-up Filling	Trued-up	Variation	MYT	Tariff Order	True-up Filling	Trued-up	Variation	MYT	Tariff Order	True-up Filling	Trued-up	Variation
		A	B	C	D	D-B	A	B	C	D	D-A	A	B	C	D	D-A
Employee cost	Rs. Cr.	NA	1,610	1,624	1,624	14	1,680	NA	1,617	1,617	-62	1,758	1,889	1,742	1,742	-16
R&M Expenses	Rs. Cr.	NA	167	224	223	56	237	NA	235	235	-1	248	247	268	268	20
A&G Expenses	Rs. Cr.	NA	308	204	204	-104	323	NA	237	237	-86	357	358	237	237	-120
Terminal Liability	Rs. Cr.	NA	927	840	840	-87	664	NA	804	804	140	664	943	1,422	1,422	758
Total	Rs. Cr.	NA	3,011	2,891	*2,891*	*-121*	2,904	NA	*2,894*	*2,894*	*-10*	3,027	3,437	3,670	3,670	*643*
Variation	%					*0%*					*0%*					*21%*

Avg. Variation of FY20 to FY22	A	%	7%
Multiplication Factor	B	%	5%
Headroom	C=A*B*Operating Cost (Supply)	Rs./kwh	0.0223

*Multiplication factor is calculated as share of O&M Expense in ARR (excl. PPC) * Share of Operating cost in total cost of supply*

Haryana – Illustrative Ceiling Tariffs

Headroom in Operating Cost (Supply) - Trend/ Assumptions of cost escalations in various factors

Additional Capital Expenditure

Details of GFA and capitalization not provided in True-Up Orders

Avg. Variation of FY20 to FY22	A1	%	NA	
Assumption for CAPEX variation	A2	%	10%	
CAPEX Impact				***A2*Impact Items***
Depreciation Rate	B1	%	4.20%	0.42%
Interest Rate	B2	%	10.17%	1.02%
ROE	B3	%	15.50%	1.55%
Total	B			2.99%
Multiplication Factor	C	Ratio	0.04	
Headroom	C=A*B*Operating Cost (Supply)	Rs./Kwh	0.0005	

*Multiplication factor is calculated as share of Dep.+Interest+ROE Expense in ARR (excl. PPC) * Share of operating cost in total cost of supply*

Haryana

Illustrative Ceiling Tariffs

Network Charge

The Commission does not segregate the ARR components of the DISCOMs into wires and supply business. Instead, for the computation of the wheeling charge for open access, the Commission assumes a fixed 9.56% of total ARR (including power purchase cost), as being towards Network establishment and operation cost.

Trans. Charges	Units	Item	FY24
CTU	Rs. Cr.	A1	2,403
STU	Rs. Cr.	A2	2,265
Total	Rs. Cr.	A	4,668
Energy Sales	MUs	B	56,546
Trans. Charge	Rs./Kwh	A*10/B	0.83

Distribution Expense	Units	Item	FY24
ARR	Rs. Cr.	A	39,244
Dist. Wheeling Expense	Rs. Cr.	B= 9.56%*A	3,752
Energy Sales	MUs	B	56,546
Dist. Wheeling Charge	Rs./Kwh	A*10/B	0.66

Operating (Supply) Charge

Since segregated ARR for supply business of Haryana DISCOMs is not available, the Operating Cost is calculated as total ARR, less power purchase cost, less wheeling expenses (9.56% of total ARR) divided by energy sales:

Particulars	Units	Item	FY24
Total ARR	Rs. Cr.	A	39,244
Less: Power Purchase Cost	Rs. Cr.	B	32,951
Less: Distribution Wheeling Expense	Rs. Cr.	C=9.56%*A	3,752
Operating Expense	**Rs. Cr.**	**D=A-B-C**	**2,541**
Energy Sales	MUs	E	56,546
Operating Cost (Supply)	**Rs./Kwh**	**D*10/E**	**0.45**

Annexures

Illustrative Ceiling Tariffs – Tamil Nadu

Tamil Nadu – Illustrative Ceiling Tariffs

DRAFT FOR DISCUSSION

Headroom in Operating Cost (Supply) - Variation in past Trued-Up Years

Back

All figures in Rs. Cr. unless specified

		FY20				FY21				FY22			
		True-up Filed		Trued-up approved		True-up Filed		Trued-up approved		True-up Filed		Trued-up approved	
Particular	Supply Share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share	Total ARR	Supply share
O&M xpenses	35%	8,179	2,863	8,272	2,895	8,448	2,957	8,708	3,048	8,937	3,128	8,937	3,128
Depreciation	10%	1,406	141	1,367	137	1,539	154	1,539	154	1,457	146	1,457	146
Interest on Loan	10%	4,403	440	3,421	342	5,340	534	3,430	343	6,266	627	4,192	419
Interest on WC	90%	42	38	0	0	0	0	0	0	60	54		0
Return on Equity	10%	492	49	0	0	626	63	0	0	775	78		0
Other Expenses	10%	2,385	239	2,204	220	3,088	309	2,939	294	25	3		0
Less: NTI	0%		0		0		0		0	1,731	0	1,731	0
Total		**16,907**	**3,769**	**15,264**	**3,594**	**19,041**	**4,016**	**16,616**	**3,839**	**15,789**	**4,034**	**12,855**	**3,693**
Energy Sales	MUs		77,391		76,974		73,622		73,434		80,759		83,867
Operating Cost (Supply)	Rs./kwh		0.49		0.47		0.55		0.52		0.50		0.44

Tamil Nadu – Illustrative Ceiling Tariffs

Headroom in Operating Cost (Supply) - Trend/ Assumptions of cost escalations in various factors

Bad Debt provisioning

Particulars	Items	Units	FY23
Cost of Supply	A	Rs./Unit	8.35
Margin	B	%	0.25%
Cost of Supply, post Margin	C=A/(1-B)	Rs./Unit	8.37
Headroom	D=C-A	Rs./Unit	0.0209

O&M Expense

		FY20			FY21			FY22		
Particulars	Units	True-up Filling	Trued-up	Variation	True-up Filling	Trued-up	Variation	True-up Filling	Trued-up	Variation
		A	*B*	B-A	*A*	*B*	B-A	*A*	*B*	B-A
O&M Expense	Rs. Cr.	*2,863*	*2,895*	*33*	*2,957*	*3,048*	*91*	*3,128*	*3,128*	*0*
Variation	%			*1%*			*3%*			*0%*

Avg. Variation of FY20 to FY22	A	%	1%
Multiplication Factor	B	%	5%
Headroom	C=A*B*Operating Cost (Supply)	Rs./kwh	0.0003

*Multiplication factor is calculated as share of O&M Expense in ARR (excl. PPC) * Share of Operating cost in total cost of supply*

Tamil Nadu – Illustrative Ceiling Tariffs

Headroom in Operating Cost (Supply) - Trend/ Assumptions of cost escalations in various factors

Additional Capital Expenditure

No MYT or Tarif Order available to assess cost variation; Capex filed in true-up petition is same as trued-up

Avg. Variation of FY20 to FY22	A1	%	NA	
Assumption for CAPEX variation	A2	%	10%	
CAPEX Impact				***A2*Impact Items***
Depreciation Rate	B1	%	5.28%	0.53%
Interest Rate	B2	%	10.50%	0.00%
ROE	B3	%	14.00%	0.74%
Total	B			1.27%
Multiplication Factor	C	Ratio	0.03	
Headroom	C=A*B*Operating Cost (Supply)	Rs./Kwh	0.0002	

*Multiplication factor is calculated as share of Dep.+Interest+ROE Expense in ARR (excl. PPC) * Share of operating cost in total cost of supply*

Annexure – Tamil Nadu

DRAFT FOR DISCUSSION

Back

Illustrative Ceiling Tariffs

Cost of Power

		FY 23		FY 24		FY 25		FY 26		FY 27
Power Purchase	**Mix**	**Rs./Kwh**	**Mix**	**Rs./Kwh**	**Mix**	**Rs./Kwh**	**Mix**	**Rs./Kwh**	**Mix**	**Rs./Kwh**
Thermal	43%	4.52	43%	4.49	43%	4.58	45%	4.61	56%	4.45
Hydro	0%	0.00	0%	0.00	0%	0.00	0%	0.00	0%	0.00
Wind	5%	3.12	5%	3.28	5%	3.28	5%	3.44	5%	3.61
Solar	9%	4.48	10%	4.48	11%	4.48	11%	4.48	11%	4.48
Other RE	0%	5.30	0%	5.53	0%	5.53	0%	5.71	0%	5.75
Others	15%	4.06	15%	4.27	15%	4.48	15%	4.70	15%	4.94
ST	28%	5.30	27%	5.27	26%	5.23	24%	5.14	56%	5.11
Own Generation										
Thermal	81%	6.93	81%	7.35	84%	6.43	85%	6.20	86%	5.90
Hydro	19%	3.15	19%	3.18	16%	3.21	15%	3.20	14%	3.22
Wind	0%	0.00	0%	0.00	0%	0.00	0%	0.00	0%	0.00
Solar	0%	0.00	0%	0.00	0%	0.00	0%	0.00	0%	0.00
Other RE	0%	0.00	0%	0.00	0%	0.00	0%	0.00	0%	0.00
Others	0%	0.00	0%	0.00	0%	0.00	0%	0.00	0%	0.00
ST	0%	0.00	0%	0.00	0%	0.00	0%	0.00	0%	0.00
Total, Ex-Bus		**5.06**		**5.16**		**5.05**		**5.01**		**4.87**
CTU Loss	%	1.69	%	1.63	%	1.57	%	1.50	%	1.44
STU Loss	%	3.81	%	3.81	%	3.81	%	3.81	%	3.81
Dist. Loss	%	11	%	10	%	10	%	10	%	10
Cost of Power		**6.01**		**5.87**		**5.85**		**5.83**		**5.67**

Annexure – Tamil Nadu

Illustrative Ceiling Tariffs

Distribution Wheeling Charge

Particulars	Units	FY 23	FY 24	FY 25	FY 26	FY 27
Operation & Maintenance Expenses	Rs Crs	6,486	6,936	7,415	7,839	8,288
Depreciation	Rs Crs	1,427	1,646	1,854	2,085	2,170
Interest on Long-term Loan Capital	Rs Crs	4,147	4,486	4,880	4,936	4,848
Interest on Working Capital	Rs Crs	0.57	1.45	5.49	8.15	6.94
Total	Rs Crs	**12,061**	**13,069**	**14,155**	**14,868**	**15,312**
Energy Sales	MUs	86,166	89,882	93,740	97,936	102,342
Distribution Wheeling Charge	**Rs./Kwh**	**1.40**	**1.45**	**1.51**	**1.52**	**1.50**

Operating (Supply) Charge

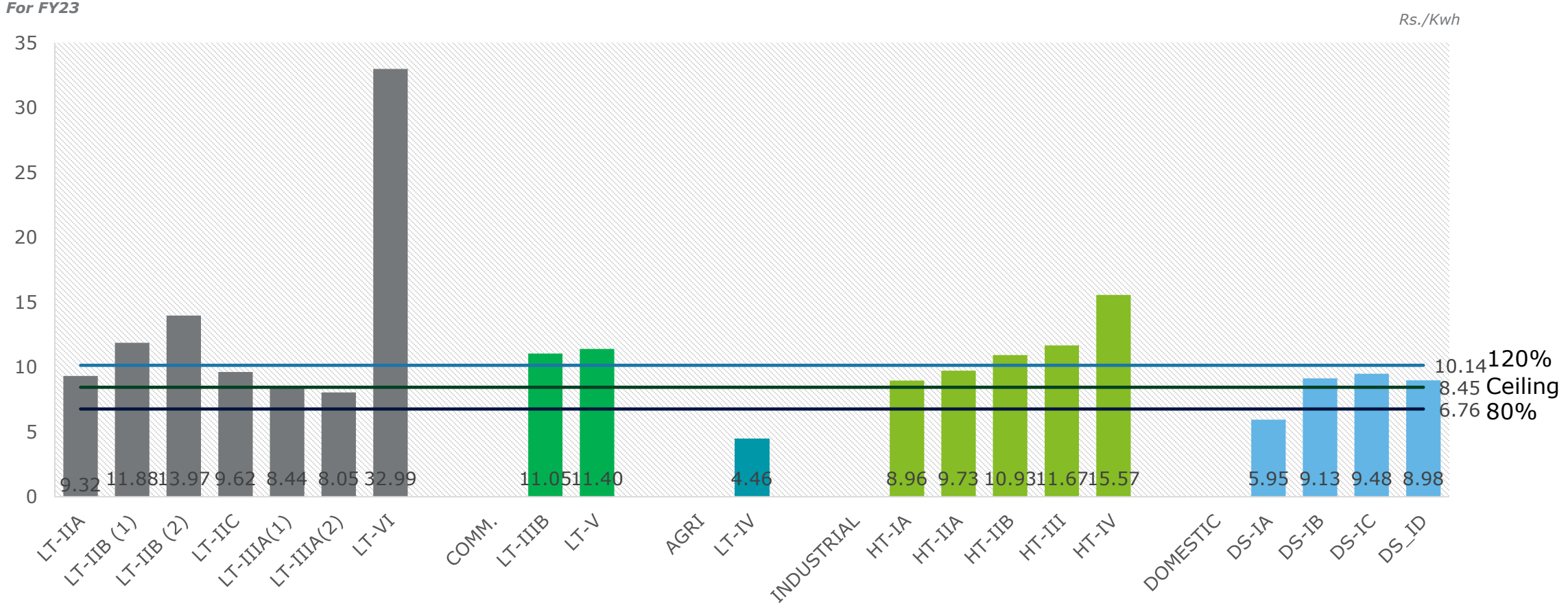
Particulars	Units	FY 23	FY 24	FY 25	FY 26	FY 27
Operation & Maintenance Expenses	Rs Crs	3,493	3,734	3,993	4,221	4,462
Depreciation	Rs Crs	159	182	206	231	241
Interest on Long-term Loan Capital	Rs Crs	461	498	543	549	539
Interest on Working Capital	Rs Crs	5	14	50	73	62
Total	**Rs Crs**	**4,118**	**4,428**	**4,791**	**5,074**	**5,305**
Energy sales	MUs	86,166	89,882	93,740	97,936	102,342
Operating Cost (Rs./Kwh)	**Rs./Kwh**	**0.48**	**0.49**	**0.51**	**0.52**	**0.52**

Tamil Nadu

Illustrative Ceiling Tariffs

Impact on DISCOMs/ Consumers

For FY23



Annexures

Others

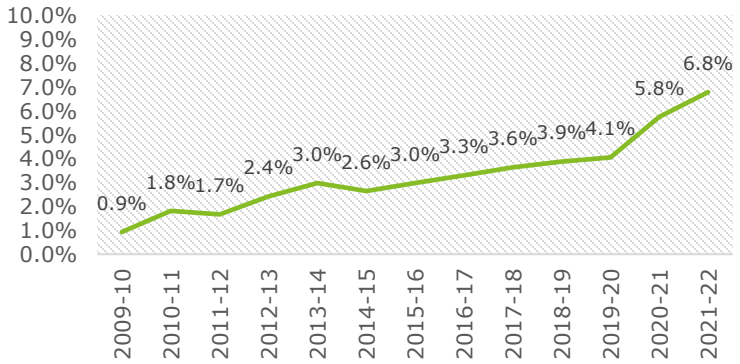
Annexure - Cost of Power

Challenges in Indian Context

Power Purchase Cost:

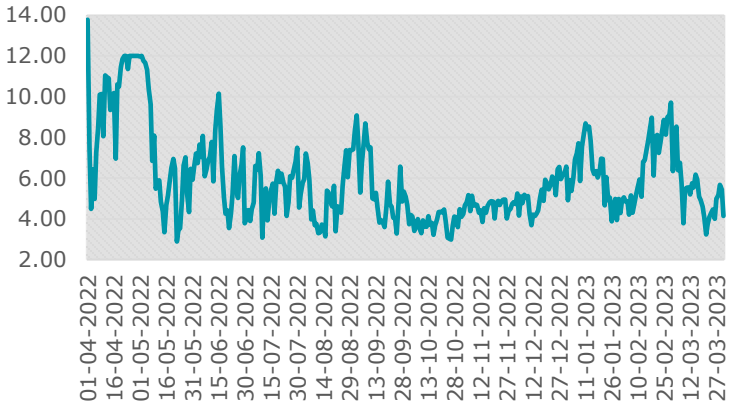
- Majority of the power procurement is done through long term PPAs (of periods upto 25 years)
- High variations are observed in Market Clearing Prices on power exchanges
- Power mix varies significantly from DISCOM to DISCOM

Px Volumes as % Total Generation



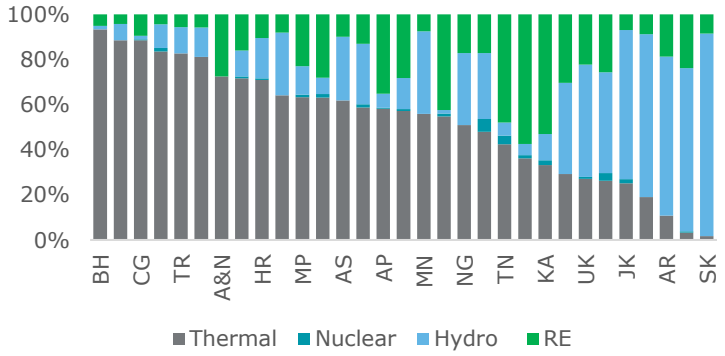
Source: CERC Report on ST Power Market 2021-22

Daily MCP on dam (Rs./kwh)



Source: IEX Market Snapshot

Mix of source wise installed capacity



Source: CEA report on installed capacity (Mar-23)

Annexure – RIIO and DUoS Framework

DRAFT FOR DISCUSSION

Used by Ofgem UK for determination of Network Costs

- Ofgem sets price controls for Distribution Network Operators (DNOs) by applying 'Revenue using Incentives to deliver Innovation and Outputs (RIIO)' framework
- Under RIIO, a baseline revenue (or TOTEX or Allowed Revenue) is determined based on costs including expected efficient expenditure, allowance for taxation, capitalization and depreciation, regulatory asset value and WACC
- Further, Incentives/ Penalties are provided in addition to baseline revenues basis performance of company on various output parameters; Outputs are defined under six categories – Customer Satisfaction, Reliability and Availability, Safety, Conditions for Connections, Environmental Impact and Social Obligations.
- DNOs recover their allowed revenue from customers through Distribution Use Of System (DUoS) charges. DUoS is calculated using EHV Distribution Charging Methodology (EDCM) for the large, industrial customers connected at the highest voltages, and the Common Distribution Charging Methodology (CDCM) for the remaining customers. These methodologies are outlined in Schedule 16 and 17 of Distribution and Connection Use of System Agreement (DCUSA).
- The methodology of DUoS under DCUSA, calculates the tariff by essentially dividing the allowed revenue by maximum exit load from the network; the maximum exit load is determined using a Loss Adjustment Factor (LAF). LAFs are determined by network companies annually in accordance with the Balancing and Settlement Code (BSC).

Headroom Margin

Trend/ Assumptions of cost escalations in various factors

Back

MH

Factors (FY24)	Rs./Kwh	Remarks
O&M Expense (Supply)	0.0006	~2% variation in past 3 true-ups
Addl. CAPEX	0.0004	For 10.00% addl. Capex
Bad Debt provisioning	NA	Already built in ARR
Total	**0.0010**	**0.11%** of Ops. Cost (supply)

BH

Factors (FY24)	Rs./Kwh	Remarks
O&M Expense (Supply)	0.0003	~2% variation in past 3 true-ups
Addl. CAPEX	0.0005	For 10.00% addl. capex
Bad Debt provisioning	0.0417	0.50% Margin on ACoS
Total	**0.0424**	**11%** of Ops. Cost (supply)

HR

Factors (FY24)	Rs./Kwh	Remarks
O&M Expense (Supply)	0.0223	~7% variation in past 3 true-ups
Addl. CAPEX	0.0002	For 10.00% addl. Capex
Bad Debt provisioning	0.0344	0.50% Margin on ACoS (as per Regulation)
Total	**0.0569**	**12%** of Ops. Cost (supply)

TN

Factors (FY24)	Rs./Kwh	Remarks
O&M Expense (Supply)	0.0003	~1% variation in past 3 true-ups
Addl. CAPEX	0.0002	For 10.00% addl. Capex
Bad Debt provisioning	0.0209	0.25% Margin on ACoS (as per Regulation)
Total	**0.0214**	**4%** of Ops. Cost (supply)

FOR RE Working Group

17th January 2024

*by the Consultant supported through USAID/SAREP

Agenda

- Context
- Highlights of WG Meetings
- Key Issues & Recommendations
  - ❖ Implementation Aspects of Banking of Energy
  - ❖ Tariff for Green Energy to be supplied by DISCOM

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
• 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: ❖ 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	• 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: ❖ 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	• 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: ❖ 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: ❖ 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 1: Applicable Banking Charges (1/2)

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 1: 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 • Other RE: INR 0.96/ Unit • Wind: INR 0.25/ Unit • Hydro: INR 3.10/ Unit

Issue: Methodology for Green Tariff Computation (1/2)

- **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."

-Thank you

Madhya Pradesh : Green Tariff Determination Method (1/2)

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**

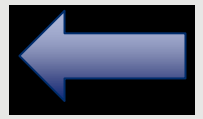
Case I: Green Tariff Computation as per GEOA Rules

- 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**	-	-	-	-	-	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	[illegible]4

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%