Terms and Conditions for Determination of Multi Year Tariff Regulations, 2024 [Draft]

The Uttarakhand Electricity Regulatory Commission notified draft **"Terms and Conditions for Determination of Multi Year Tariff" Regulations, 2024.** The control period of this regulation is for five years i.e. FY 2025-26 to 2029-30.

Summary: The Commission circulated the Multi Year Tariff Determination process to initiate discussion and solicit feedback from stakeholders. These regulation will cover the entire state of Uttarakhand and applicable to all new and existing generation companies, transmission licensees and distribution licensees. The calculation method for O&M expenses for entities have been updated. The insurance for the hydro power plant can be trued up based on past trends.

The draft document can be accessed here:

CER Opinion

1. **Regulatory Framework to Emphasise Efficiency linked Normative Cost Recovery:** The regulatory approach for tariff determination for generation and transmission can generally be classified as normative cost of service approach as tariff depends on UERC norms for most of the operational and financial parameters. In the spirit of the EA, 2003, and Tariff Policy, the regulatory approach, while approving normative costs, should emphasize on **efficiency improvement** by the regulated entities both in terms of operational parameters as well as financial costs. **While the adopted approach allows for cost recovery based on norms, the norms themselves are based on actuals of the immediate preceding control period with an escalation rate[1].** The regulatory framework should also provide for continuous improvement in efficiency through better norms by **introducing an efficiency factor**. Operational efficiency norms must provide incentive for improvement for the generation companies as well as the transmission licensees.

2. **Introducing efficiency factor for O&M expenses[2]:** The prevailing approach for determination of norms for O&M expenses is essentially a 'lagged' approach to set the O&M cost benchmarks allowing for recovery of 'the actual' O&M expenditure after inflationary adjustment for the control period. In the spirit of encouraging efficient operation, it is suggested that an efficiency factor may be incorporated for arriving at the normative O&M cost for the subsequent year and so on. For the above purpose, a framework similar to RPI-X regulation is suggested to be implemented for treatment of O&M expenses as illustrated in the following Figure 1 to encourage efficient performance.

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[1] Singh (2024) has emphasised adoption on benchmarking studies to fix such norms rather than linking it up with primarily with historical costs. Singh (2024), "Comments to CERC's Terms & Conditions for tariff 2024-29", *Regulatory Insights*, Volume 6, Issue 4, Centre for Energy Regulation (CER), IIT Kanpur. This may be reviewed at, https://cer.iitk.ac.in/newsletters/regulatory_insights/Volume06_Issue04.pdf

[2] CER's opinion on "Developing MYT Framework: Insights and Discussion on the Draft Regulations of Gujarat and Chhattisgarh" at 1st Regulatory Manthan. https://cer.iitk.ac.in/RM/rm1

Thus, the O&M expenses for a project can be expressed as per the following equation

$$O\&M_t = O\&M_{t-1} * \left(1 + \frac{Price\ Index_t}{Price\ Index_{t-1}} - X_t^{O\&M}\right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where,
O&M: Normative Operation & Maintenance expenditure as approved by the Commission;
Price Index: Consumer Price Index for Industrial Workers;
$Xt^{O\&M}$: Factor representing an annual target for efficiency improvement in O&M.

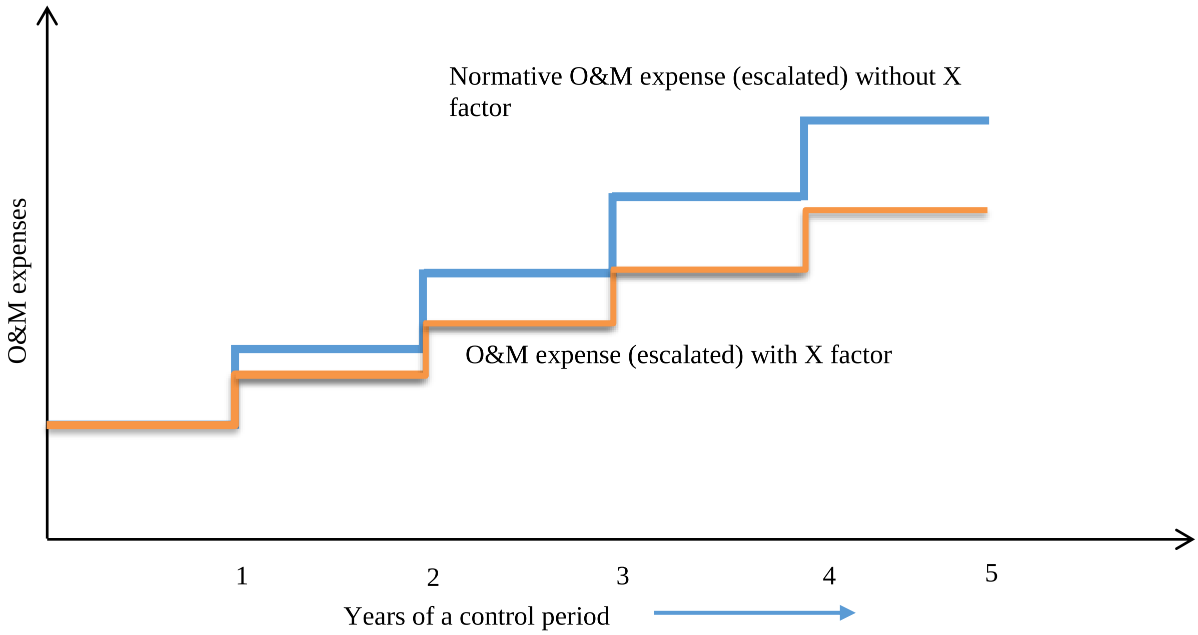

Figure 1: Representation of O&M expenses with efficiency factor "X" (So: Singh (2024))

The choice of the price index may be based on a single index or a weighted composite index calculated on the basis of proportion of different cost sub-components of the O&M cost i.e. wages & salary (W&S), repair & maintenance (R&M) and administrative & general (A&G) expenses. The W&S component may be linked to the CPI (industrial worker), R&M to the WPI of electrical equipment or weighted sum of electrical equipment and machinery & equipment with the A&G expenses to be linked to the CPI applicable to white collar workers ($CPI_{\text{urban \& clerical workers}}$). Such a sub-component based application of price index could be feasible if costs under the respective heads can be apportioned reliably. This approach was earlier suggested by CER, IIT Kanpur and has been adopted by Gujarat Electricity Regulatory Commission in the draft GERC (Multi-Year Tariff) Regulations, 2023.

3. **Determining the Efficiency "X" factor:** Efficiency factor should be an integral part of the O&M cost approval process as the organisation is expected to optimise its cost of operation over time, while still providing for reasonable hedge from general price rise. Appropriate benchmarking studies such as Data Envelopment Analysis[3], etc. may be conducted to set benchmark for efficiency improvement across individual 'controllable' cost parameters across the MYT control period.

[3] Anoop Singh, B Sharma, "DEA based approach to set energy efficiency target under PAT Framework: A case of Indian cement industry", The Central European Review of Economics and Management 2 (1), 103-132

4. **Reduction of equity base post repayment of loan:** Return on any component of capital base, for example debt or equity is due only till the same hasn't been repaid for. For e.g. interest on debt is payable only on the amount of debt outstanding, which is reduced by the amount of depreciation year-on-year basis. Post repayment of debt, the depreciation amount is essentially 'returning' the equity capital. This amount is available for the equity holders at their disposal.

   It is suggested that accumulated depreciation, over and above the accumulated debt repayment (including repayment towards normative loan), should be used to reduce the equity base for allowable RoE as a portion of the risk capital of the investor is available as free cash flow and is no longer deployed in normal business operations. In its absence, the consumer is charged RoE for a capital that has already been recouped through depreciation (beyond debt repayment). In case, such 'excess depreciation' is reinvested in the business, for example to finance working capital, this should attract the appropriate cost of funds as approved for such same.

   The Figure 2 below illustrates the comparison between the prevailing modified GFA approach where only loan is reduced over time while, equity component, hence RoE remains constant throughout the life of the project vs the net fixed asset (NFA) approach where the depreciation beyond the repayment of loan reduces the equity base. The proposed regulatory approach for reduction of equity base should be integral part of the regulatory framework in the power sector, thus mitigating additional burden of tariff paid by the consumers.

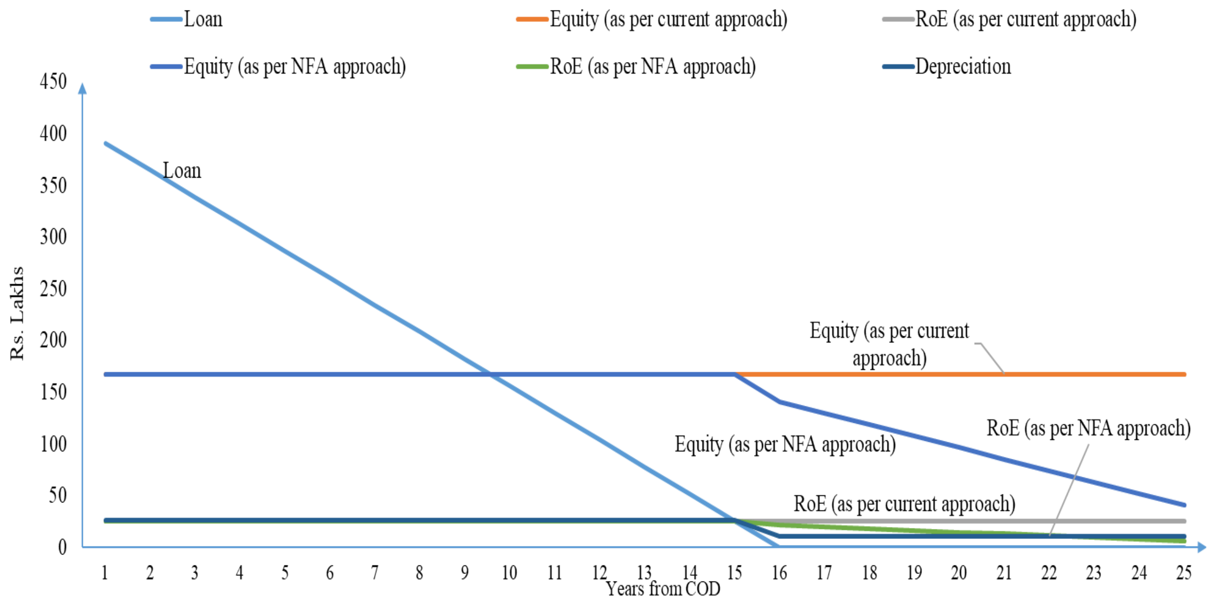

Figure 2: Modified GFA approach vs NFA approach *(So: Singh (2024))*

5. **Payment in capitalisation and decapitalisation:** In the proposed clause 22 (4) "*Any addition/modification to the existing assets exceeding Rs. 2.50 Crore in case of distribution licensees, Rs. 5 Crore in case of generating companies and Rs. 10 Crore in case of transmission licensees shall be taken up only after prior approval of the Commission.*"

   Further clarification must be provided on above mentioned limit that it is mandatory for the entities to submit investment plan for approval along with true-up petition of relevant financial year, if such investment did not have prior approval (from Commission).

6. **Fixing Return on Equity (RoE) for generating stations:** Clause 26 (2) *"Return on equity shall be computed on at the **base rate of 15.5% for thermal generating stations, transmission licensee, SLDC and run of the river hydro generating station and at the base rate of 16.50% for the storage type hydro generating stations** and run of river generating station with pondage and distribution licensee on a post-tax basis" (emphasis added).*

   Further the first proviso of 26 (2) states that *"Provided that return on equity in respect **of additional capitalization after cut-off date beyond the original scope excluding additional capitalization due to Change in Law,** shall be computed at the base rate of one-year marginal cost of lending rate (MCLR) of the State Bank of India plus 350 basis points as on 1st April of the year, subject to a **ceiling of 14%;**"* (emphasis added)

   The Capital Assest Price Model (CAPM) approach used for calculation of cost of equity is a post-tax estimate. A study at CER, IIT Kanpur[4] using CAPM and multifactor models using a comprehensive data for over 125 infrastructure companies estimates the cost of equity to be around 10% - 12.5% as shown in Figure 3 below which is lower than the regulated return of the sector.

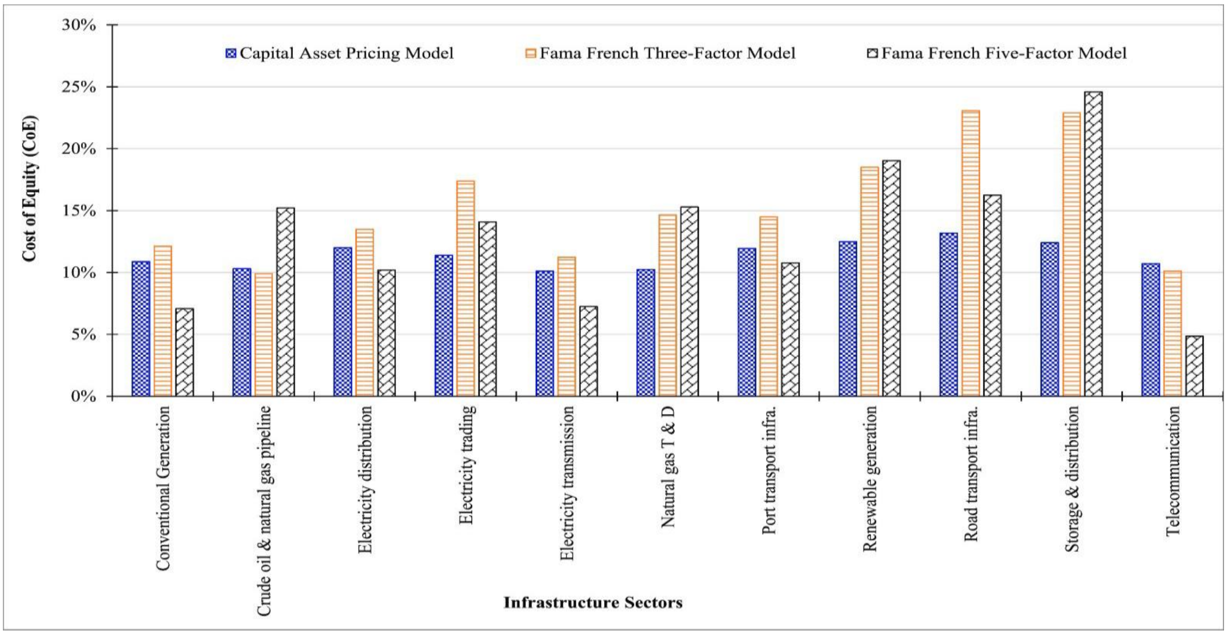

Figure 3: Cost of equity for different infrastructure sectors *(So: Singh et al. (2022))*

   The following Figure 4 shows the G-Sec 10-year bond yield over one-year horizon which averages around **7.14%** since July 2023. The proposed return on equity thus has a markup of 700-800 basis points above the yield on debt. Against the backdrop of the above discussion, the suggested return on equity seems higher than expected by the market. Additional return for hydro may be justified due to additional risks faced by such projects. Due to significantly lower risk for transmission projects, RoE for transmission should be lower than that for generation.

[4] Kewal Singh, Anoop Singh, Puneet Prakash, 2022, "Estimating the cost of equity for the regulated energy and infrastructure sectors in India" Utilities Policy, http://dx.doi.org/10.1016/j.jup.2021.101327

Reported RoE of major transmission companies in regulated business has hovered around 17.15% - 22.4% over the past three reported years. In comparison, reported RoE of regulated generation business hovers around 11.57% - 12.58% over the past three reported years[5] (So: Standalone Annual Statements of the respective companies). The regulation should consider market signals and economic arguments while fixing RoE.

The Commission may consider lower rate of RoE for old plants across thermal as well as hydro sector, as well as for the transmission sector. However, given the extended construction period for hydro-electric plants, which does not provide 'return' on the invested equity during construction, the Commission may justify higher RoE for such plants including those with PSP. This would encourage new investment during the upcoming control period.

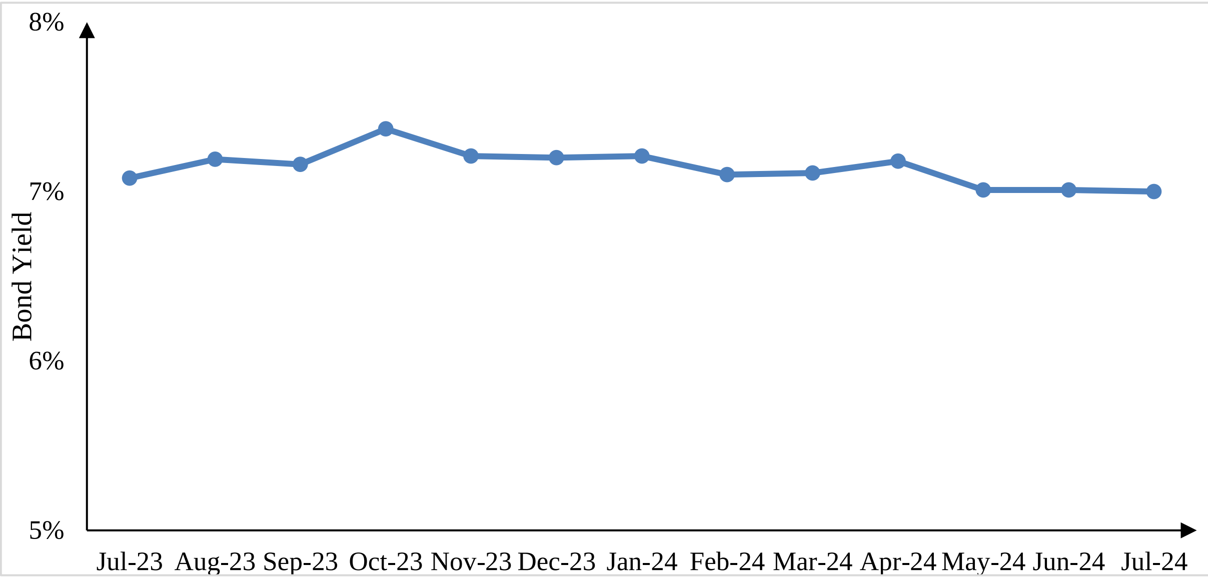

Figure 4: G-Sec 10-year Bond Yield over One year horizon

7. **Payment in capitalisation and decapitalisation:** In the proposed clause 22 (4) "*Any addition/modification to the existing assets exceeding Rs. 2.50 Crore in case of distribution licensees, Rs. 5 Crore in case of generating companies and Rs. 10 Crore in case of transmission licensees shall be taken up only after prior approval of the Commission.*"

   Further clarification must be provided that investments below the specified limit do not require prior approval, these are/may be subject to review along with true-up petition of relevant financial year. This would ensure that prudence is exercised by the generating companies while undertaking such investments.

8. **Methodology for calculation of escalation rates:** In the proposed clause 48 (1) methodology used for escalation of O&M cost for all the the entities mentioned for tariff determination is shown in Figure 5 and the clause states that *"O&M expenses determined shall be escalated for subsequent years to arrive at the O&M expenses for the Control Period by applying the*

[5] Center for Energy Regulation, "Regulatory Insights Volume 06 Issue 04",https://cer.iitk.ac.in/newsletters/regulatory_insights/Volume06_Issue04.pdf

Escalation factor (EFk) for a particular year (Kth year) which shall be calculated using the following formula"

$$EF_k = 0.55xWPI_{Inflation} + 0.45xCPI_{Inflation}$$

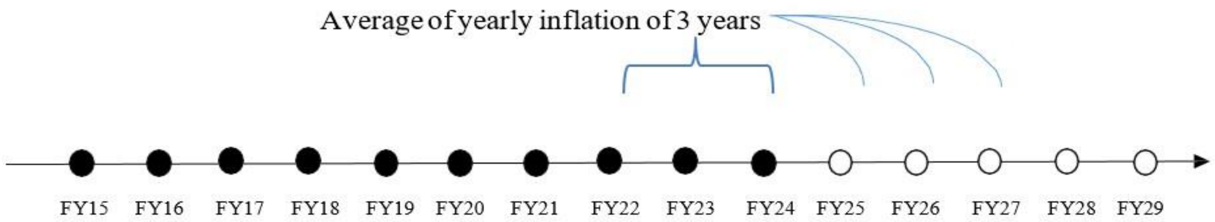

Figure 5: Calculation of escalation rate as per prevailing approach

The prevailing approach for the estimation of the escalation rate for each year of the control period 2025-30 is as shown in the Figure 5 below. It is suggested that instead of taking the <u>average of the escalation rates</u> for the last 3 years for CPI and WPI respectively as per the existing approach, **the Compound Annual Growth Rate (CAGR) of the indices** may be used as it is a mathematically correct representation of the same, as illustrated in the example in Table 1 below.

Table 1: Index Calculation – Normal Average vs CAGR

Index	**Growth Rate**	**CAGR**	**Recalculated Values using**	
			Average Gr.	**CAGR**
100		7.71%	100	100
105	5.00%		107.74	107.71
116	10.48%		113.12	113.10
125	7.76%		**124.97**	**124.94**
Average/CAGR	7.74%	7.71%		

CER's Approach: To address the same, it is recommended to use the **3-year moving average escalation rate with the latest year having a weightage of 50%, mid-year having the weightage of 30% and oldest year having the weightage of 20%.** The same has been demonstrated in the Figure 6 below.

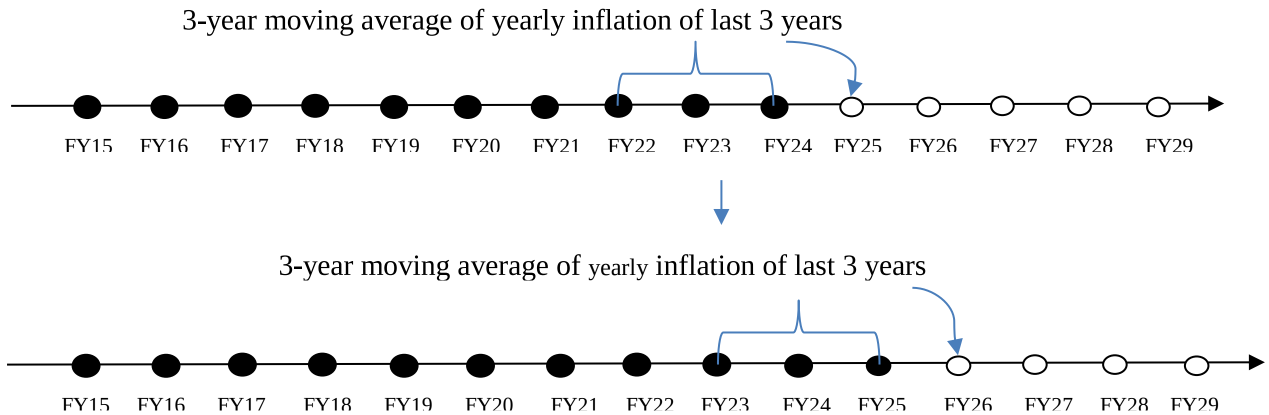

Figure 6: CER's approach for calculation of escalation rate- 3-year rolling average method

For calculation of the escalation rate for $(n+1)^{th}$ year, the weights given to escalation rates of CPI and WPI for n^{th} year, $(n-1)^{th}$ year, and $(n-2)^{th}$ year may be used in proportion of 50%, 30% and 20% respectively. These indices are to be calculated on rolling basis for each year (see Figure 6). Further, the CPI and WPI can be used in the ratio of 60:40 for escalating the O&M expenses as per the following formula:

$$\boldsymbol{ESC_t} = (\mathbf{0.6} * ((\mathbf{0.5} * \boldsymbol{ESC_{(CPI)t-1}} + (\mathbf{0.3} * \boldsymbol{ESC_{(CPI)t-2}}) + (\mathbf{0.2} * \boldsymbol{ESC_{(CPI)t-3}}))) + (\mathbf{0.4} * ((\mathbf{0.5} * \boldsymbol{ESC_{(WPI)t-1}}) + (\mathbf{0.3} * \boldsymbol{ESC_{(WPI)t-2}}) + (\mathbf{0.2} * \boldsymbol{ESC_{(WPI)t-3}})))$$

Where,

ESC_t = Escalation rate for t^{th} year

$ESC_{(CPI)t-1}$ = Escalation rate of CPI for $(t-1)^{th}$ year

$ESC_{(WPI)t-1}$ = Escalation rate of WPI for $(t-1)^{th}$ year

9. **Implication of Force Majure on Insurance:** In the proposed clause 48 (2) (f) *"In case of multi-purpose hydroelectric stations, with irrigation, flood control and power components, the O&M expenses chargeable to power component of the station only shall be considered for determination of tariff.*

Provided that in case of hydro generating stations the generating station shall submit the assessment of the security requirement and insurance expenses along with its estimated expenses, which shall be trued up in the respective tariff Orders based on the past trends of year-wise actual insurance and security expenses incurred with appropriate justification or in the manner the Commission finds the same fit."

The insurance cost may not follow a trend as it may depend on various factors including the risk perception, reinsurance cost etc. The regulation may provide for use of best available market rate as a benchmark for insurance cost. This would motivate the entities to engage in meaningful bargain to arrive at a least cost insurance option for the identified risk coverage. Furthermore, these costs are to subject to true-up later. In case of private security hire, competitive tendering should be mandated to ensure competitive cost.

In case of any Force Majeure event or an event covered under prevailing insurance policy of the identified assets, the expenditure/ investment required to make good of that asset must first be recovered through such insurance payment. Any expense/investment over and above the insurance cover should be subject to Commission's approval.

10. **Energy Charge Rate (ECR) for excess energy:** In the proposed clause 50 (7) *" In case the Energy Charge Rate (ECR) for a hydro generating station, as computed above, exceeds **ninety paise** per kWh, and the actual saleable energy in a year exceeds { DE x (100 – AUX) x (100-FEHS)/ 10000 } MWh, the Energy Charge for the energy in excess of the above shall be billed at **one hundred thirty paise** per kWh only:"* (emphasis added).

    Based on the observation made from above regulation, it can be inferred that the excess energy produced will be paid at Rs. 1.3/ kWh in case of the original ECR being higher than Rs. 0.9/ kWh. It is important to note that 'all' of the approved cost of the hydro power plant is fully recoverable through fixed charges and ECR for the available (design) energy. The excess energy generated is a bonus as any amount payable for the same would lead to over recovery beyond the approved costs. The regulation seems to go beyond that and suggest higher price for excess energy than that approved as ECR. It is notable that in case of variable renewable energy plants, energy produced beyond the CUF is generally paid at the half of the approved levelised tariff. The identified anomaly needs to be addressed. The above clause also does not provide for cases with ECR is up to ninety paisa per kWh. Furthermore, the following proviso also lacks clarity about its applicability.

    Modified clause 50 (7) is suggested below,
    *" In case the Energy Charge Rate (ECR) for a hydro generating station, as computed above, exceeds **ninety paise** per kWh, and the actual saleable energy in a year exceeds { DE x (100 – AUX) x (100-FEHS)/ 10000 } MWh, the Energy Charge for the energy in excess of the above shall be billed at **ninety paise** per kWh only:" (change suggested).*
    *"Provided that in a year following a year in which total energy generated was less than the design energy for reasons beyond the control of the Generating Company, the Energy Charge Rate shall be reduced to ninety paise per kWh for **<u>any excess energy</u>** after the energy charge shortfall of the previous year has been made up." (addition suggested)*

11. **Resource Adequacy Planning:** Clause 8 (c) (iii) *"Power procurement plan in case of long term, medium term and short term based on the sales forecast and distribution loss trajectory for each year of the business plan period;".*

    After issuance of guidelines by CEA Guidelines on Resource Adequacy Planning (RAP) framework for India, many SERCs have either issued the RAP regulations or published draft regulation for stakeholders to provide suggestions. Based on experience of CER and EAL in carrying out Long-term Demand Forecasting and Power Procurement Planning for the states of Uttar Pradesh and Chhattisgarh, we reinforce the need for a robust regulatory framework for the same. From these studies, it was inferred that significant economic benefits in terms of reduced private and social costs are possible through RAP[6].

12. **Smart meters based Monitoring of RTS through Stratified Sampling:** Increasing behind-the-meter installations presents a significant challenge for demand forecasting by

[6] Singh et al. (2019), *Regulatory Framework for Long-Term Demand Forecasting and Power Procurement Planning*, Centre for Energy Regulation (CER), IIT Kanpur, (Book ISBN:978-93-5321-969-7); https://cer.iitk.ac.in/assets/downloads/CER_Monograph.pdf

distribution licensees (Discoms). In the absence of data on electricity generation from the behind-the-meter RTS installation and consumption thereof, the forecasting models would face very serious challenge to forecast both short-term as well as long-term electricity demand. Apart from this, it would also be challenging to estimate green energy generation and consumption for accounting towards RPO of the distribution licensees as well as estimation of contribution to India's climate policy commitments of reducing emission intensity.

It is suggested that **stratified sampling** based remote metering of RTS to monitor generation and consumption thereof on real-time basis be implemented across the state. Adding a sampling-based monitoring system (through smart meters) would enhance the visibility to the distribution licensees, the system operation as well as regulators and policy makers. Use of stratified sampling across feeders/ DTs geographically spread across different agro-climatic areas would enhance reliability of data.

The stratified sampling-based data collection rate may be set, say, at least 1-2% of small-scale projects ranging from 1 kW to 3 kW, 2-3 % for 3-5 kW and 5% for 5 kW and above. It is also important to ensure that such data is archived and be accessible to the Discoms and SLDCs. Such data should also be access to academic/research institutions to enable research assisting better forecast of solar generation as well as electricity demand. Appropriate forecasting tools would be able to incorporate the available data in ST as well as LT demand forecasting for the distribution licensee.

13. **Accounting of RE procurement from RTS installations:** The proposed clause 72 of the draft regulations provides guidelines for distribution licensee to procure power in long-term, medium-term and short-term durations. The power procurement details of such transactions are provide in tariff filling. Data on power procured/ received from net metering/gross metering/ net billing/ government schemes remains elusive and be included in the reported power procurement. This would also provide for transparent accounting and compliance of RPO.

14. **Additional Short-term power procurement:** In the clause 75 (2) *"Provided that if the total power purchase cost or quantum for any block of six months including such short-term power procurement exceeds 105% of the power purchase cost or quantum as approved by the Commission for the respective block of six months, the Distribution Licensee shall have to obtain prior approval of the Commission;*

    The proviso can be changed to provide better clarification *"Provided that if the* ***projected*** *power purchase cost or quantum for any block of six months* ***on rolling basis*** *including such short-term power procurement exceeds 105% of the power purchase cost or quantum,* ***respectively,*** *as approved by the Commission for the respective block of six months, the Distribution Licensee shall have to obtain prior approval of the Commission;*

15. **Optimisation of Short-term power purchase:** As per draft clause 75 (3), the distribution licensee is permitted to procure short-term power at a price lower than the Commission approved cost of electricity. It is recommended that the **Commission obligates the**

distribution licensee to demonstrate cost reduction achieved through such optimisation of short-term power procurement. This would enhance transparency and accountability of distribution licensee.

16. **RPO compliance and Power Procurement:** The power procurement plan of the distribution licensee should account for the RPO target trajectory. To enable the Commission to incorporate the impact of RE procurement on power purchase cost, it is suggested that the Commission should direct the distribution licensee and other obligated entities to provide following annual data for the same. This would also ensure effective monitoring of RPO compliance by the distribution licensee.

Table 3: RPO compliance format (Year-_____)

Sr. No.	**Name of Obligated Entities**			
1	**Source/ Category-wise**			
2	**Total energy consumption (MU)**			
3	**Total RPO target (%)**			
4	**Previous year RPO (Total Shortfall/ Surplus) (%)**			
5	**Source of RE energy**	Electricity Generation/ Procurement (MU)	Target Achieved (%)	Shortfall/ Surplus (%)
6	RE Power (PPA)			
7	PXs (GTAM, GDAM)			
8	REC			
9	RTS on-grid/ off-grid			
10	Accounting for excess RE energy consumed by the Obligated entities#			
11	Others (if any)			

Note: # - beyond the applicable RPO