vi) Operation & Maintenance Cost:

The Commission, in its earlier Order dated 18.08.2021 had considered O&M expenses at Rs.670/kW for SRTPV units and at Rs.5.03 lakh/MW for ground mounted Megawatt Scale solar plants, with an annual escalation of 5.72%. With this escalation, the Commission proposes to consider O&M expenses at Rs.708/kW for SRTPV units and at Rs.5.32 lakh/MW for ground mounted Megawatt Scale solar plants.

vii) Interest and Tenure of Debt:

The Commission, in its Order dated18.08.2021, had allowed 9.30% per annum as interest on capital loan and considered the tenure of loan as 13 years.

The CERC in its CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2020, has proposed normative interest rate (MCLR) plus two hundred (200) basis points above the average State Bank of India MCLR (One-year Tenor) prevalent during the last available six months. Considering the prevalent lending rate being the Marginal Cost of Funds-Based Lending Rate (MCLR) at which the bank prices all its loans, the Commission proposes to adopt the latest MCLR rate of 8.60% for a tenor of 3 years, notified by the State Bank of India plus 200 points, which works out to 10.60% p.a.

Therefore, the Commission proposes to consider interest on capital loan at the rate of 10.60 % per annum and consider the tenure of loans as 13 years for determination of tariff.

viii) Working Capital and Interest on Working Capital:

The Commission, in its earlier Order dated 18.08.2021 had allowed the working capital equivalent to one month's receivables for SRTPV Projects and Two Month's receivables for MW scale Ground Mounted Solar Projects and had allowed interest on working capital at the rate of 10.00%.

The prevalent lending rate being the Marginal Cost of Funds-Based Lending Rate(MCLR) at which the bank prices all its loans, the Commission in view of the massive reduction in the interest rates being charged on the loans by the banking sector, proposes to adopt the latest MCLR rate of 1-year tenor of 8.40% notified by the State Bank of India plus 250 basis points (as adopted for generation, transmission and the distribution & Retail supply tariffs) which works out to 10.90% per annuam.

ix) Depreciation:

The Commission, in its earlier order had considered the depreciation on 90% of the capital cost (excluding land cost) at the rate of 5.798% for the first 13 years for the ground mounted projects and 5.38% for the SRTPV Projects for the first 13 years, and the remaining depreciation spread equally over the remaining useful life of the ground mounted projects and SRTPV plants/ units. The Commission proposes to provide depreciation on 90% of the capital cost (excluding land cost) at the rate of 5.748 % for the first 13 years for the ground mounted projects and 5.38 % for the SRTPV Projects for the first 13 years, and the remaining depreciation spread equally over the remaining useful life of the ground mounted projects and SRTPV plants.

x) Return on Equity:

The Commission, in its earlier Order dated 18.08.2021 had allowed RoE of 14%. The CERC in its Regulations has also allowed normative RoE of 14%.

Hence, the Commission proposes to consider the RoE at 14 %.

xi) Discount Rate:

The Commission, in its earlier order dated 18.08.2021 had considered the discount factor of 10.71% for computing levellised tariff.

Since the financing of capital cost is based on 70% debt and 30% equity, the Commission had proposed that it would be appropriate to reckon weighted average cost of capital (WACC) as the discount factor to arrive at the levellised tariff.

Hence, the Commission proposes to consider the Discount Rate of 11.62%.

xii) Auxiliary consumption:

The Commission, proposes to consider auxiliary consumption of 0.25% of the gross generation for MW scale projects and not allow any auxiliary consumption for SRTPV plants.

xiii) Other Issues for kW projects (SRTPV plants):

The Commission proposes to continue the following, parameters based on the earlier Order:

i. to install SRTPV units with capacity equivalent to the sanctioned load of the respective consumer's installation for the purpose of gross or net-metering with their own investments.

ii. To allow installation of SRTPV on Government buildings, as per the Commission's Order dated 11.11.2016, with the tariff for any surplus energy injected as determined by the Commission.

iii. To allow installation of multiple SRTPV units or single SRTPV unit with the combined installed capacity in a single premises not exceeding the total sanctioned load of all the consumers in that premises as per the Order dated 15.09.2017at a tariff 90% of the tariff as determined by the Commission.

iv. To allow installation of SRTPV under various models on the third party investments for installing SRTPV on the Consumers' buildings as per the Commission's Order dated 09.12.2019, with the tariff as determined by the Commission.

v. To continue the Timelines for various activities involved in implementation of SRTPV projects, as detailed in the Order dated 18.08.2021.

vi. To allow only gross metering arrangement and not to allow the facility of net metering for SRTPV plants to the consumers purchasing power from other sources/ captive sources under open access mechanism as per the Commission's Order dated 18.07.2022.

III. New proposals:

i. Grid Integrated Solar Roof top plant with Energy storage system:

As already discussed in the foregoing paras, the Karnataka Renewable Energy Policy 2022-2027 has emphasised the need to integrate the battery energy storage system with renewable energy sources. The Commission, with a view to encourage the battery energy storage system connected with the SRTPV power plants, desires to determine generic tariff in respect of the consumer who desires to install the grid connected solar rooftop (by complying with all the earlier Orders of the Commission). In such cases, the capacity of SRTPV shall be more than 1000kW and less than 2000kW, with the

required capacity of battery energy storage system, by executing Power Purchase Agreement with the distribution licensee.

There are multiple battery energy storage technologies which differ in their capital cost, operation cost, cycle life etc. For solar energy systems with battery energy storage, the grid interactive hybrid inverters are required. For enabling the Commission to determine the generic tariff, the stakeholders are requested to submit the operational and financial parameters as per the prevailing market rate, in the following format for different make duly supported by supporting documents.

1. **Operational Parameters:**

Sl. No	Particulars	Unit	Value
1	BESS (Battery Energy Storage System) Power Rating (Design)	MW	
2	Depth of Discharge (DOD)	%	
3	Round Trip Efficiency (RTE) (Direct tapping from solar module at DC side)	%	
4	BESS Power Rating (Contract)	MW	
5	Initial period for degradation	Years	
6	Annual degradation factor (for the initial period of 3 years)	%	
7	Annual degradation factor (from 4th year onwards)	%	
8	Discharge Cycle on daily basis	Cycles per day	
9	Discharge Cycle on annual basis	Cycles per year	
10	BESS Discharge Duration (C Rate)	Hours peak Cycle	
11	BESS Energy Rating (Contract)	MWh	
12	Annual Charging Requirement (1st year)	MU	
13	Annual Discharge Capacity (1st year)	MU	
14	Auxiliary consumption	%	
15	Annual Cycle life	No	
16	BESS life period	Years	

2. Financial Parameters:

Sl. No	Particulars	Amount in Rs. Crores
1	Battery Pack Cost (excl. GST & duties)	
2	Basic Custom Duty (BCD) and compensation Cess for Battery Packs	
3	GST on Battery Pack	
4	Total Battery Pack Cost (including GST & Duties)	
5	Balance of Plant (Inverter & PCS, Contains, Racks, HVAC, Fire Fighting, BMS) and commissioning & installation Cost (incl. GST & Duties)	
6	Total BESS Cost	

ii. Virtual Net-metering Arrangement:

Virtual Net-metering is aimed at promoting solar power plants in rural areas. In this arrangement, the entire electricity generated from a Solar Project installed at the consumer premises or any other location, is injected through bi-directional Solar energy meters and the electricity exported is adjusted in either one or more than one electricity service connection(s) of the participating Consumer(s) located within the same Distribution Licensee's area of supply. In order to support virtual net-metering arrangement, the Commission proposes virtual net-metering with Capex, Third party investment (RESCO) and utility financial models, for investment in rural areas.

In this regard, the stakeholders are requested to submit their views/suggestions for implementing the virtual net-metering arrangement along with financial models. The Stakeholders have to submit the necessary supporting documents.

iii. Grid Interactive Support Charges or Grid Support Charges:

As per section 61(c) of Electricity Act, 2003, the Commission has to determine the tariff/charges for the factor which would encourage competition, efficiency, economical use of the resources, good performances and optimum investments.

In respect of the investment made on the solar power plants by the consumers/ developers, the tariff is being determined as per tariff parameters considering prevailing market conditions. For the investment made by the distribution licensee to ensure economical use of the resources as per section 61 (c) of Electricity Act, 2003, the Commission is required to determine the charges, for use of network by RE power generators/consumers/developers. Such applicable charges may be defined as Grid Interactive Support Charges or Grid Support Charges which are applicable for usage of grid network by the RE Generators/consumers (only for net-metering arrangement) / RE captive consumers in respect of captive generation integrated with the grid.

The Commission, in the tariff Order dated 04.04.2022 has determined the revised Aggregate Revenue Requirement for FY23, for distribution business of each distribution licensees and is as detailed below:

Amount in Rs. Crores

Sl. No	Particulars	BESCOM	MESCOM	CESC	HESCOM	GESCOM	Total
1	R&M expenses	1381.93	297.48	459.85	885.61	703.88	3728.75
2	Employee Expenses						
3	A&G Expenses						
4	Depreciation	873.93	169.63	238.74	265.17	187.93	1735.4
	Interest & Finance Charges						
5	Interest on Loans	552.57	129.04	146.88	315.61	124.4	1268.5
6	Interest on working Capital	56.38	11.46	10.13	43.2	17.87	139.04
7	Interest on consumer deposits	0	0	0	0	0	0
8	Other interest & Finance charges	39.39	1.58	5.18	10	0	56.15
9	Less: Interest & Other expenses capitalised	-169.51	-2.1	-10	-40	-5.17	-226.78
	Total		607.08	850.77	1479.59	0	2937.44
10	ROE	176.51	118.2	0	0	0	294.71
11	Other Income	-81.13	-6.69	-2.26	0	-8.75	-98.83
12	Provision for Taxes	0	0	0	0	0	0
14	Regulatory assets	0	51.6306	64.8186	0	74.94	191.3892
15	NET ARR	2830.04	770.22	913.33	1479.59	1095.1	7088.28
16	Total Sales in MU including IP, BJ/KJ and Others	29396.63	5387.54	6911.06	12082.25	7921.91	61699.39
17	LT Sales	20997.93	4199	5477.05	9731.15	6223.9	46629.03
18	HT Sales	8398.68	1188.54	1434.01	2351.1	1698.01	15070.34

There is a segregation of network cost into HT and LT levels in the ratio of 70:30. The HT level infrastructure (i.e., 70%) is the network for the ultimate use by both HT & LT consumers. Hence, the cost of such (70%) common infrastructure is apportioned between HT & LT level sales, based on the ratio of sales to HT & LT category consumers. The remaining portion of the Network cost in HT level as well as the 30% of the segregated cost towards LT level to be appropriated to LT category Sales. Adopting such a methodology, the Commission proposes to compute the grid interactive support charges or grid support charges as detailed below:

Sl. No	Details	HT Level	LT Level	Total
1	Ratio of Network cost	70%	30%	100%
2	Network cost in Rs Crores	4961.796	2126.484	7088.28
3	Network cost in relation to HT sales in Rs. crores	1211.941		
4	Network cost in relation to LT sales in Rs. Crores		5876.339	
5	Energy sales in MU	15070.36	46629.03	61699.39
6	Network charges per unit (in Rs)	**0.80**	**1.26**	

The grid interactive support charges or grid support charges towards the Distribution wire business is chargeable to HT prosumers at 80 Paise/ kWh and for LT prosumers at Rs.1.26 / kWh.

The above charges are proposed to all new prosumers under net metering SRTPV and any captive plant which is connected to the grid as specified under respective category.

iv. Interconnection with Distribution System:

As per the KERC (Implementation of Solar Rooftop Photovoltaic Power Plants) Regulations,2016 and the Commission's Order issued from time to time, the SRTPV of above 50kW upto 2000kW is to be connected to the 11kV distributed network. As per Conditions of Supply of Electricity of Distribution Licensees in the State of Karnataka (CoS) (Ninth Amendment), 2020, the SRTPV consumers

have been requesting the Commission to allow to connect the SRTPV installation to LT level upto 150kW.

The ESCOMs are requested to examine this proposal and furnish their views as to the technical feasibility in allowing SRTPV connections upto 150 kW on LT level.

IV. Keeping in view the above parameters, the proposed revised tariff for FY24 works out as follows:

(a) kW scale SRTPV projects (1kW to 2000kW and 1kW to 10kW):

Parameters for Kilowatt scale		
Cost/kW- in Rs.	1kW to 10kW-47000	1kW to 2000kW-40000
Useful life of the plant in years	25	25
Debt: Equity Ratio	70:30	70:30
Debt- in Rs.	32900	28000
Interest Rate on Debt-%	10.60	10.60
Debt Repayment in Yrs.	13	13
CUF in %	19	19
Equity- in Rs.	14100	12000
ROE-%	14	14
Auxiliary consumption	-	-
O & M expenses in Rs. /kW	780	780
O & M Escalation p.a.	5.72	5.72
WC interest (one month's receivables)	10.90	10.90
Depreciation in %	5.38%p.a for first 13 years and remaining depreciation spread equally over balance years of the plant's useful life.	5.38%p.a for first 13 years and remaining depreciation spread equally over balance years of the plant's useful life.
Tariff (Rs/unit)	**4.26**	**3.79**

(b) MW scale Solar Power Projects (Ground mounted)

Parameters for Megawatt scale solar projects	
Cost/MW- Rs. Lakhs	400
Useful life of the plant in years	25
Debt: Equity Ratio	70:30
Debt-Rs. Lakhs	280
Interest Rate on Debt-%	10.60
Debt Repayment in Yrs.	13
CUF	19

Equity- Rs. lakhs	120
ROE-%	14
Auxiliary consumption	0.25%
O & M expenses in Rs. Lakhs/MW	5.03
O & M Escalation p.a.	5.72
WC interest (two months' receivables)	10.90
Depreciation in %	**5.744** % p.a. for first 13 years and remaining depreciation spread equally over balance years of the plant useful life.
Tariff (Rs/unit)	**3.64**

The Commission hereby invites suggestions/Comments/Views form the stakeholders/ interested persons. The Comments/ suggestions/ views may be submitted to the Secretary, KERC, No-16, C-1, Millers Tank Bed area, Vasanthanagara, Bangalore-52 or by email kerc-ka@nic.in on or before **06.03.2023.**

7/2/23

Secretary,

KERC