

# KERALA STATE ELECTRICITY REGULATORY COMMISSION

## NOTICE

No. 442/CT/2015/KSERC

Dated, Thiruvananthapuram, 4<sup>th</sup> November, 2016.

The Kerala State Electricity Regulatory Commission hereby publishes under sub-section (3) of Section 181 of the Electricity Act, 2003, the following draft of the Kerala State Electricity Regulatory Commission (Renewable Energy) Amendment Regulations, 2016, for information of persons likely to be affected thereby. Any objection or suggestions thereon may be forwarded to the Secretary, Kerala State Electricity Regulatory Commission, KPFC Bhavanam, C.V.Raman Pillai Road, Vellayambalam, Thiruvananthapuram-10 within one month from the date of publication of this notice. Objections and suggestions received on or before the said date shall be considered by the Commission before finalization of the said draft regulation.

By order of the Commission,

Santhosh Kumar.K.B  
Secretary

## DRAFT

THE KSERC (Renewable Energy) Amendment Regulations, 2016.

**1. Short title and commencement.-** (1) This regulations may be called the Kerala State Electricity Regulatory Commission (Renewable Energy) Amendment Regulations, 2016.

(2) This shall come into force from the date of publication of the same in the Official Gazette.

**2. Amendment of the Regulations, -** In the Kerala State Electricity Regulatory Commission (Renewable Energy) Regulations, 2015,-

(i) In regulation 4,-

(a) for sub-regulation (1) and the proviso thereunder the following shall be substituted, namely:-

“(1) Every distribution licensee shall purchase renewable energy not less than the percentage of the total energy supplied by it to the consumers within its areas of licence excluding consumption met from hydro sources of power during the financial years commencing from 2016-17 as specified in the table below,-

Table

Financial Year	Minimum SOLAR RPO as % of total consumption (excluding hydro power) within the area of distribution licensee	Minimum Non solar RPO as % of total consumption(excluding hydro power) within in the area of distribution licensee	Total
2016-17	2.75	8.75	11.50
2017-18	4.75	9.5	14.25
2018-19	6.75	10.25	17.00

Provided that the renewable energy if any, generated by the distribution licensee from the renewable sources of energy and supplied to its consumers shall be accounted towards its renewable purchase obligation:

Provided further that the solar energy generated or purchased in excess of solar renewable purchase obligation may be accounted towards the non-solar renewable purchase obligation.”.

(b) Sub-regulation (6) shall be omitted.

(ii) In regulation 5,-

(a) for sub-regulation (1) and the proviso thereunder the following shall be substituted, namely:-

“(1) Every buyer licensee shall purchase renewable energy not less than the percentage of the total energy supplied by it to the consumers within its areas of licence excluding consumption met from hydro sources of power during the financial years commencing from 2016-17 as specified in the table below,-

Table

Financial Year	Minimum SOLAR RPO as % of total consumption (excluding hydro power) within the area of buyer licensee	Minimum Non solar RPO as % of total consumption(excluding hydro power) within in the area of buyer licensee	Total
2016-17	2.75	8.75	11.50
2017-18	4.75	9.5	14.25
2018-19	6.75	10.25	17.00

Provided that the solar energy generated and consumed by the open access consumers in excess of solar renewable purchase obligation may be accounted towards its non-solar renewable purchase obligation:

Provided further that the renewable energy if any, generated or consumed by the open access consumers shall be accounted towards its renewable purchase obligation.”.

(b) Sub-regulation (7) shall be omitted.

- (iii) In regulation 6,-  
 (a) for sub-regulation (1) and the proviso thereunder the following shall be substituted, namely:-

“(1) Every captive consumer shall purchase renewable energy not less than the percentage of its total captive consumption of electricity generated except from renewable sources or by co-generation process and excluding consumption met from hydro sources of power during the financial years commencing from 2016-17 as specified in the table below,-

Table

Financial Year	Minimum SOLAR RPO as % of total consumption (excluding hydro power) within the area of captive consumer	Minimum Non solar RPO as % of total consumption(excluding hydro power) within in the area of captive consumer	Total
2016-17	2.75	8.75	11.50
2017-18	4.75	9.50	14.25
2018-19	6.75	10.25	17.00

Provided that the solar energy generated and consumed by the captive consumer in excess of solar renewable purchase obligation may be accounted towards its non-solar renewable purchase obligation:

Provided further that the renewable energy if any, generated or consumed by the captive consumer shall be accounted towards the its renewable purchase obligation.”.

- (b) Sub-regulation (2) shall be omitted.

- (iv) In regulation 7,-  
 (a) for sub-regulation (1) and the proviso thereunder the following shall be substituted, namely:-

“(1) Every open access consumer shall purchase renewable energy not less than the percentage of its total energy availed by it through open access during the financial years commencing from 2016-17 as specified in the table below,-

Table

Financial Year	Minimum SOLAR RPO as % of total consumption (excluding hydro power) within the area of open access consumer	Minimum Non solar RPO as % of total consumption(excluding hydro power) within in the area of open access consumer	Total
2016-17	2.75	8.75	11.50
2017-18	4.75	9.50	14.25
2018-19	6.75	10.25	17.00

Provided that the solar energy if any generated and consumed by the open access consumer in excess of solar renewable purchase obligation may be accounted towards its non-solar renewable purchase obligation:

Provided further that the renewable energy if any, generated or consumed by the open access consumer shall be accounted towards its renewable purchase obligation.

(b) Sub-regulation (2) shall be omitted.

- (v) In sub-regulation (3) of regulation 9, the words “as provided in sub-regulation (6) of regulation 4 or sub-regulation (7) of regulation 5 or sub-regulation (2) of regulation 6 or sub-regulation (2) of regulation 7, as the case may be” shall be omitted
- (vi) In sub-regulation (6) of regulation 20 the words and the figures “and wind zone III” the words and figures “wind zone III, wind zone IV and wind zone V” shall be substituted.
- (vii) After regulation 23, the following regulation shall be inserted namely

“23 - A : Normative parameters and the tariff applicable to the renewable energy projects commissioned during the financial years 2016-17.- Notwithstanding anything contrary contained in these regulation the normative parameters, the generic tariff and the tariff period applicable to the renewable energy project commissioned during the financial year 2016-17 shall be as specified in the Annexures I to VII attached to these regulations, the list of which is shown below,-

List of Annexures I to VII

SI No	Description	Tariff Rs/ kWh		
		Levelised Tariff	Benefit of Accelerated Depreciation	Net levelised tariff upon adjusting for Accelerated Depreciation benefit) ( if availed)
I	Small hydro-electric projects having installed capacity below 5MW	5.54		
II	Wind energy generation projects, located in wind zone – 1( CUF- 20%)	6.60	0.71	5.89
III	Wind energy generation projects, located in wind zone – 2( CUF- 22%)	6.00	0.65	5.36
IV	Wind energy generation projects, located in wind zone – 3( CUF- 25%)	5.28	0.57	4.71
V	Wind energy generation projects, located in wind zone – 4( CUF- 30%)	4.40	0.47	3.93
VI	Wind energy generation projects, located in wind zone – 5( CUF- 32%)	4.13	0.44	3.68
VII	Solar photo voltaic energy generation projects	5.68	0.60	5.08

- (viii) After the existing Annexures the following Annexures shall be inserted namely,  
(Annexures I to VII attached)

By Order of the Commission

Santhosh Kumar. K.B  
Secretary

**Annexure 1 (2016-17)**

**Small hydro – electric projects having installed capacity below 5MW**

Sl. No.	Head	Sub-Head	Detailed Head	Unit	Norm	
1	Power Generation	Capacity	(i) Installed Power Generation capacity	MW	1	
			(ii)Capacity Utilization Factor	%	30%	
			(iii)Auxiliary Consumption	%	1%	
			(iv)Useful life	Years	35	
2	Project cost	Capital cost/ MW	Power plant cost	Rs. lakh / MW	646.755	
3	Source of fund		Tariff period	Years	35	
			<u>Debt-equity</u>	Debt	%	70%
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	452.728	
			Total Equity Amount	Rs Lacs	194.026	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	452.73
			Moratorium Period	Years	0	
			Repayment Period (incl'd Moratorium)	Years	12	
			Interest Rate	%	12.76%	
			<u>Equity Component</u>	Equity amount	Rs Lacs	194.03
			Normative ROE (Post-tax)			16%
			Return on Equity for fist 10 years	% p.a		20%
			Return on Equity 11 <sup>th</sup> year onwards	% p.a		24.00%
			Weighted average of ROE			22.86%
			Discount Rate		10.64%	
4	Financial Assumptions		Income tax	%	34.610%	
			<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13 <sup>th</sup> year onwards	%	0.87%	
5	Working capital	<u>For Fixed charges</u>	O&M charges	Months	1	
			Maintenance Spare	% of O&M expenses	15%	
			Receivables for debtors	Months	2	
			Interest on working capital	%	13.26%	
6	Operation and Maintenance	O&M expenses (2016-17)	Total O&M Expenses Escalation	Rs. Lakhs	24.98	
			O&M Expenses (2012-13)	%	5.72%	
					20.00	

Generic Tariff Rs.5.54/unit for 35 years.

**Annexure 2 (2016-17)**

**Wind Energy Generation Projects, located in wind zone – 1 (CUF – 20%)**

Sl. No.	Head	Sub-Head	Detailed Head	Unit	Norm	
1	Power Generation	Capacity	(i) Installed Power Generation capacity	MW	1	
			(ii)Capacity Utilization Factor	%	20%	
			(iii)Useful life	Years	25	
2	Project cost	Capital cost/ MW	Power plant cost	Rs. lakh / MW	619.807	
3	Source of fund		Tariff period	Years	13	
			<u>Debt-equity</u>	Debt	%	70%
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	433.865	
			Total Equity Amount	Rs Lacs	185.942	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	433.86
			Moratorium Period	Years	0	
			Repayment Period (incl'd Moratorium)	Years	12	
			Interest Rate	%	12.76%	
			<u>Equity Component</u>	Equity amount	Rs Lacs	185.94
			Return on Equity for fist 10 years	% p.a	20.00%	
			Return on Equity 11 <sup>th</sup> year onwards	% p.a	24.00%	
			Weighted average of ROE		22.40%	
Discount Rate		10.64%				
4	Financial Assumptions		Income tax	%	34.610%	
			<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13 <sup>th</sup> year onwards	%	1.54%	
5	Working capital	<u>For Fixed charges</u>	O&M charges	Months	1	
			Maintenance Spare	% of O&M expenses	15%	
			Receivables for debtors	Months	2	
			<u>For Variable Charges</u>	Interest on working capital	%	13.26%
6	Operation and Maintenance	<u>O&amp;M (2016-17)</u>	<u>Total O&amp;M Expenses Escalation O&amp;M (2012-13)</u>	Rs. Lacs/ MW	17.49	
				%	5.72%	
				Rs. Lacs / MW	9.00	

Generic Tariff Rs. 6.60/unit for 25 years.

**Annexure 3 (2016-17)**

**Wind Energy Generation Projects, located in wind zone – 2 (CUF – 22%)**

Sl. No.	Head	Sub-Head	Detailed Head (2)	Unit	Norm	
1	Power Generation	Capacity	(i) Installed Power Generation capacity	MW	1	
			(ii)Capacity Utilization Factor	%	22%	
			(iii)Useful life	Years	25	
2	Project cost	Capital cost/ MW	Power plant cost	Rs. lakh / MW	619.807	
3	Source of fund		Tariff period	Years	13	
			<u>Debt-equity</u>	Debt	%	70%
				Equity	%	30%
				Total Debt Amount	Rs Lacs	433.865
				Total Equity Amount	Rs Lacs	185.942
			<u>Debt Component</u>	Loan Amount	Rs Lacs	433.86
				Moratorium Period	Years	0
				Repayment Period (incl'd Moratorium)	Years	12
				Interest Rate	%	12.76%
			<u>Equity Component</u>	Equity amount	Rs Lacs	185.94
				Return on Equity for fist 10 years	% p.a	20.00%
				Return on Equity 11 <sup>th</sup> year onwards	% p.a	24.00%
				Weighted average of ROE		22.40%
	Discount Rate		10.64%			
4	Financial Assumptions	<u>Fiscal Assumption</u>	Income tax	%	34.610%	
			<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
				Depreciation Rate 13 <sup>th</sup> year onwards	%	1.54%
5	Working capital	<u>For Fixed charges</u>	O&M charges	Months	1	
				Maintenance Spare	% of O&M expenses	15%
				Receivables for debtors	Months	2
			<u>For Variable Charges</u>	Interest on working capital	%	13.26%
6	Operation and Maintenance	<u>O&amp;M (2016-17)</u>		Rs. Lacs/ MW	11.24	
			<u>Total O&amp;M Expense Escalation</u>	%	5.72%	
			<u>O&amp;M (2012-13)</u>	Rs. Lacs / MW	9.00	

Generic Tariff Rs. 6.00/unit for 25 years.



**Annexure 4 (2016-17)**

**Wind Energy Generation Projects, located in wind zone – 3 (CUF – 25%)**

Sl. No.	Head	Sub-Head	Detailed Head	Unit	Norm
1	Power Generation	<u>Capacity</u>	(i) Installed Power Generation capacity	MW	1
			(ii)Capacity Utilization Factor	%	25%
			(iii)Useful life	Years	25
2	Project cost	<u>Capital cost/ MW</u>	Power plant cost	Rs. lakh / MW	619.807
3	Source of fund		Tariff period	Years	13
		<u>Debt-equity</u>	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	433.865
			Total Equity Amount	Rs Lacs	185.942
		<u>Debt Component</u>	Loan Amount	Rs Lacs	433.86
			Moratorium Period	Years	0
			Repayment Period (incl'd Moratorium)	Years	12
			Interest Rate	%	12.76%
		<u>Equity Component</u>	Equity amount	Rs Lacs	185.94
			Return on Equity for fist 10 years	% p.a	20.00%
			Return on Equity 11 <sup>th</sup> year onwards	% p.a	24.00%
			Weighted average of ROE		22.40%
			Discount Rate		10.64%
4	Financial Assumptions	<u>Fiscal Assumption</u>	Income tax	%	34.610%
		<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13 <sup>th</sup> year onwards	%	1.54%
5	Working capital	<u>For Fixed charges</u>	O&M charges	Months	1
			Maintenance Spare	% of O&M expenses	15%
			Receivables for debtors	Months	2
		<u>For Variable Charges</u>	Interest on working capital	%	13.26%
6	Operation and Maintenance	<u>O&amp;M (2016-17)</u>		Rs. Lacs/ MW	11.24
		<u>Total O&amp;M Expenses Escalation</u>		%	5.72%
		<u>O&amp;M (2012-13)</u>		Rs. Lacs / MW	9.00

Generic Tariff Rs. 5.28/unit for 25 years.

**Annexure 5 (2016-17)**

**Wind Energy Generation Projects, located in wind zone – 4 (CUF – 30%)**

Sl. No.	Head	Sub-Head	Detailed Head	Unit	Norm
1	Power Generation	<u>Capacity</u>	(i) Installed Power Generation capacity	MW	1
			(ii)Capacity Utilization Factor	%	30%
			(iii)Useful life	Years	25
2	Project cost	<u>Capital cost/ MW</u>	Power plant cost	Rs. lakh / MW	619.807
3	Source of fund		Tariff period	Years	13
		<u>Debt-equity</u>	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	433.865
			Total Equity Amount	Rs Lacs	185.942
		<u>Debt Component</u>	Loan Amount	Rs Lacs	433.86
			Moratorium Period	Years	0
			Repayment Period (incl'd Moratorium)	Years	12
			Interest Rate	%	12.76%
		<u>Equity Component</u>	Equity amount	Rs Lacs	185.94
			Return on Equity for fist 10 years	% p.a	20.00%
			Return on Equity 11 <sup>th</sup> year onwards	% p.a	24.00%
			Weighted average of ROE		22.40%
			Discount Rate		10.64%
4	Financial Assumptions	<u>Fiscal Assumption</u>	Income tax	%	34.610%
		<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13 <sup>th</sup> year onwards	%	1.54%
5	Working capital	<u>For Fixed charges</u>	O&M charges	Months	1
			Maintenance Spare	% of O&M expenses	15%
			Receivables for debtors	Months	2
		<u>For Variable Charges</u>	Interest on working capital	%	13.26%
6	Operation and Maintenance	<u>O&amp;M (2016-17)</u>		Rs. Lacs/ MW	11.24
		<u>Total O&amp;M Expenses Escalation</u>		%	5.72%
		<u>O&amp;M (2012-13)</u>		Rs. Lacs / MW	9.00

Generic Tariff Rs. 4.40/unit for 25 years.

**Annexure 6 (2016-17)**

**Wind Energy Generation Projects, located in wind zone – 5 (CUF – 32%)**

Sl. No.	Head	Sub-Head	Detailed Head	Unit	Norm
1	Power Generation	<u>Capacity</u>	(i) Installed Power Generation capacity	MW	1
			(ii)Capacity Utilization Factor	%	32%
			(iii)Useful life	Years	25
2	Project cost	<u>Capital cost/ MW</u>	Power plant cost	Rs. lakh / MW	619.807
3	Source of fund		Tariff period	Years	13
		<u>Debt-equity</u>	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	433.865
			Total Equity Amount	Rs Lacs	185.942
		<u>Debt Component</u>	Loan Amount	Rs Lacs	433.86
			Moratorium Period	Years	0
			Repayment Period (incl'd Moratorium)	Years	12
			Interest Rate	%	12.76%
		<u>Equity Component</u>	Equity amount	Rs Lacs	185.94
			Return on Equity for fist 10 years	% p.a	20.00%
			Return on Equity 11 <sup>th</sup> year onwards	% p.a	24.00%
			Weighted average of ROE		22.40%
			Discount Rate		10.64%
4	Financial Assumptions	<u>Fiscal Assumption</u>	Income tax	%	34.610%
		<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13 <sup>th</sup> year onwards	%	1.54%
5	Working capital	<u>For Fixed charges</u>	O&M charges	Months	1
			Maintenance Spare	% of O&M expenses	15%
			Receivables for debtors	Months	2
		<u>For Variable Charges</u>	Interest on working capital	%	13.26%
6	Operation and Maintenance	<u>O&amp;M (2016-17)</u>		Rs. Lacs/ MW	11.24
		<u>Total O&amp;M Expenses Escalation</u>		%	5.72%
		<u>O&amp;M (2012-13)</u>		Rs. Lacs / MW	9.00

Generic Tariff Rs. 4.13/unit for 25 years.

**Annexure 7 (2016-17)**  
**Solar PV Projects**

**Solar Photo Voltaic Energy Generation Projects**

Sl. No.	Head	Sub-Head	Detailed Head	Unit	Norm	
1	Power Generation	<u>Capacity</u>	(i) Installed Power Generation capacity	MW	1	
			(ii) Auxiliary Consumption	%	0.00%	
			(iii) Capacity Utilization Factor	%	19.0%	
			(iv) Useful life	Years	25	
2	Project cost	<u>Capital cost/ MW</u>	Power plant cost	Rs. lakh / MW	530.02	
3	Financial Assumption		Tariff period	Years	25	
			<u>Debt-equity</u>	Debt	%	70%
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	371.02	
			Total Equity Amount	Rs Lacs	159.01	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	371.02
			Moratorium Period	Years	0	
			Repayment Period (incl'd Moratorium)	Years	12	
			Interest Rate	%	12.76%	
			<u>Equity Component</u>	Equity amount	Rs Lacs	159.01
			Return on Equity for first 10 years	% p.a	20.00%	
			Return on Equity 11 <sup>th</sup> year onwards	% p.a	24.00%	
			Weighted average of ROE		22.40%	
			Discount Rate		10.64%	
4	Financial Assumptions	<u>Fiscal Assumption</u>	Income tax	%	34.61%	
			MAT Rate (for first 10 years)	%	21.34%	
			80 IA benefits	Yes/No	Yes	
			<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13 <sup>th</sup> year onwards	%	1.54%	
			5	Working capital	<u>For Fixed charges</u>	O&M charges
Maintenance Spare	% of O&M expenses	15%				
Receivables for debtors	Months	2				
<u>For Variable Charges</u>	Interest on working capital	%				13.26%
6	Operation and Maintenance	<u>O&amp;M (2016-17)</u>				O&M (2012-13)
			<u>O&amp;M Expenses Escalation</u>	%	5.72%	
			O&M (2012-13)	Rs. Lacs	11.00	

Generic Tariff Rs. 5.68/unit for 25 years.

