

DRAFT**KERALA STATE ELECTRICITY REGULATORY COMMISSION,****NOTICE**

No. 442/CT/2014/KSERC

Dated, Thiruvananthapuram 31st March, 2015

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) Regulations, 2015, 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 Raod, 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,

Mathew Kurien,
Secretary**DRAFT****Kerala State Electricity Regulatory Commission (Renewable Energy) Regulations, 2015.**

In exercise of the powers conferred by sub-section (1) of Section 181 of the Electricity Act, 2003 (Central Act 36 of 2003) and all other powers enabling it in this behalf and after previous publication, the Kerala State Electricity Regulatory Commission makes the following Regulations, namely:-

**Chapter - I
Preliminary**

1. Short title, extent and commencement. - (1) These Regulations may be called the Kerala State Electricity Regulatory Commission (Renewable Energy) Regulations, 2015.

(2) These Regulations shall extend to the whole State of Kerala.

(3) It shall come into force at once.

2. Definitions.- (1) In these Regulations, unless the context otherwise requires,

(a) 'Act' means the Electricity Act, 2003 (Central Act 36 of 2003);

- (b) 'buyer licensee' means a licensee which is engaged in the activity of bulk purchase of electricity for sale in its area of licence;
- (c) 'central Agency' means the agency operating the National Load Dispatch Centre or such other agency as the Central Commission may designate from time to time for the purpose of implementation of the scheme relating to issuance of renewable energy certificate and performance of other duties as assigned under the provisions of the Central Electricity Regulatory Commission (Terms and Conditions for Recognition and Issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 as amended from time to time;
- (d) 'Central Commission' means the Central Electricity Regulatory Commission referred to in sub-section (1) of Section 76 of the Electricity Act, 2003;
- (e) 'certificate' means the renewable energy certificate issued by the Central Agency in accordance with procedures approved under the provisions of the Central Electricity Regulatory Commission (Terms and Conditions for Recognition and Issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 as amended from time to time;
- (f) 'Commission' means Kerala State Electricity Regulatory Commission;
- (g) 'control period' means the period during which the norms for determination of tariff for renewable energy specified under these regulations shall remain valid;
- (h) 'financial year' means the period beginning from first of April in a Gregorian calendar year and ending with the thirty first of March of the next year;
- (i) 'forbearance price' means the ceiling price for the certificate for each category of renewable energy, as determined by the Central Commission in accordance with the Central Electricity Regulatory Commission (Terms and Conditions for Recognition and Issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010, as amended from time to time, within which only, the Certificate can be dealt in the power exchange;
- (j) 'inter-connection point' means the interface point of renewable energy generating facility with the transmission system or distribution system, as the case may be;
 - (i) in relation to wind energy projects, inter-connection point shall be line isolator on outgoing feeder on high voltage side of the pooling sub-station;
 - (ii) in relation to small hydro power, inter-connection point shall be line isolator on outgoing feeder on high voltage side of generator transformer;
 - (iii) in relation to solar energy projects, inter-connection point shall be the output terminals of grid-tied inverter in the case of low voltage and the line isolator on the outgoing feeder on high voltage side of the pooling sub-station in the case of high voltage;
 - (iv) in relation to other renewable energy project, inter-connection point shall be the line isolator on the outgoing feeder on the high voltage side of the generator transformer.
- (k) 'non-firm power' means the power generated from renewable sources, the variation of which is dependent upon sunshine, cloud, wind and such other natural phenomena that cannot be accurately predicted;
- (l) 'obligated entity' means the distribution licensee or the consumer owning captive power plants or the open access consumer in the State of Kerala, who is mandated to fulfill renewable purchase obligation under these Regulations;

- (m) 'power exchange' means any exchange operating as the power exchange for electricity in terms of the orders issued by the Central Commission;
- (n) 'preferential tariff' means the tariff fixed by the Appropriate Commission for the sale of renewable energy to a licensee from a generating unit based on renewable energy sources;
- (o) 'prosumer' means the consumer who produces electricity from the renewable energy sources and consumes such electricity for his own use, fully or partially;
- (p) 'renewable energy source' means the category of renewable source for the generation of electricity such as small hydro-electric, wind, solar including its integration with combined cycle, biomass, bio fuel cogeneration, urban or municipal waste and other such sources as recognized or approved by Government of India in Ministry of New and Renewable Energy or by Government of Kerala;
- (q) 'seller licensee' means a distribution licensee or a trading licensee engaged in the bulk purchase and sale of electricity to other licensees;
- (r) 'State Agency' means the agency in the State of Kerala designated by the Commission to act as the agency for accrediting and recommending the renewable energy projects for registration and for undertaking the functions assigned by the Commission under these regulations;
- (s) 'tariff period' means the period for which tariff is to be determined by the Commission on the basis of norms specified under these Regulations;
- (t) 'useful life' in relation to a unit of a generating station including evacuation system shall mean the following duration from the date of declaration of commercial operation (COD) of such generation facility, namely:-
- (i) 35 years in the case of small hydro-electric projects having installed capacity below 5MW;
 - (ii) 35 years in the case of small hydro-electric projects having installed capacity of and above 5 MW and below 25MW;
 - (iii) 25 years in the case of wind energy power projects;
 - (iv) 25 years in the case of solar photo voltaic projects; and
 - (iv) such other period as decided by the Commission in the case of other renewable energy projects.
- (2) The words or expressions in these Regulations, which are not defined herein, shall have the same meaning as in the Act and in the case of any inconsistency, the meaning in the Act shall prevail.

Chapter - II

Renewable Energy Purchase Obligation

3. Renewable Energy Purchase Obligation of the obligated entity.- (1) Every obligated entity shall purchase from the renewable energy generating units, not less than 4.5 percentage of the total consumption of energy within its area of licence, during the financial years commencing from 2015-16, with an annual increase of 0.5 percentage per year, until the renewable energy purchase obligation reaches a maximum of 10 percentage of the total consumption of energy within its area of licence:

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

Provided further that the quantum of electricity generated from any renewable energy source by any prosumer using off grid renewable energy system and consumed by him in full or in part, shall also be accounted towards the renewable energy purchase obligation of the licensee, if the licensee pays to the prosumer, the generation based incentive at the rates approved by the Commission:

Provided also that the quantum of electricity generated from any renewable energy source by any prosumer using grid interactive renewable energy system and consumed by him in full or in part, shall also be accounted towards the renewable energy purchase obligation of the licensee, if the licensee affords to the prosumer, the benefits as specified by the Commission, under the provisions of Kerala State Electricity Regulatory Commission (Grid Interactive Distributed Solar Energy Systems) Regulations, 2014.

(2) The purchase of renewable energy as specified in sub-regulation (1) above shall be in the following ratio between the renewable energy from solar source and the renewable energy from sources other than solar source:-

(i) renewable energy from solar source –10%

(ii) renewable energy from sources other than solar source – 90%

(3) The renewable energy purchase obligation from solar sources and from sources other than solar source shall be met separately by the obligated entities:

Provided that the Commission may, on application from the obligated entity, grant in public interest, relax from this sub-regulation, for good and sufficient reasons to be recorded in writing considering factors such as availability of renewable energy within the State for purchase, impact on tariff and vagaries of climate which are beyond the control of the obligated entity.

(4) The obligation to purchase renewable energy shall be inclusive of the purchases, if any, from renewable energy sources being made by the concerned obligated entity.

(5) The purchase of renewable energy under the power purchase agreements already entered into by the obligated entity and consented to by the Commission, shall be continued till the expiry of the validity of such power purchase agreements, even if the total purchase under such agreements exceeds the percentage as specified in the above sub-regulations.

4. Renewable energy purchase obligation of the buyer licensee.- (1) The buyer licensee, which purchases energy from a seller licensee for supply to its consumers, shall not have any separate obligation for renewable energy purchase, provided the seller licensee meets the renewable energy purchase obligation for the energy sold to the buyer licensee also:

Provided that the buyer licensee shall have separate obligation for renewable energy purchase if the seller licensee does not meet the renewable energy purchase obligation for the energy sold to the buyer licensee:

Provided further that, in the case of multiple licensees supplying electricity in an area of licence, the renewable energy purchase obligation as worked out in accordance with sub-regulations (1) and (2) of regulation 3 shall be apportioned

among the licensees in proportion to the quanta of electricity supplied to the consumers by each licensee in such area of licence.

(2) The seller licensee shall purchase the quantum of renewable energy required to meet its renewable energy purchase obligation from the renewable energy generating units within the State and priority shall be given on the basis of the date of commercial operation of such renewable energy generating stations:

Provided that the seller licensee may purchase renewable energy required to meet its renewable energy purchase obligation from the renewable energy generating units outside the State, if renewable energy is not available for purchase within the State.

(3) The obligated entity shall indicate separately, the proposed quanta of purchase of renewable energy from the solar sources and from the sources other than solar sources, in its application submitted to the Commission, for the approval of the Aggregate Revenue Requirement and Expected Revenue from Charges for the ensuing year.

5. Renewable Energy Certificates under the regulations of the Central Commission.- (1) Subject to the terms and conditions in these regulations, the certificates shall be the valid instruments for the discharge of the mandatory renewable energy purchase obligations of the obligated entities to purchase electricity from renewable energy generating units.

(2) If the quantum of renewable energy purchased from solar sources by an obligated entity falls short of its solar renewable energy purchase obligation as provided in sub-regulation (1) of regulation 3, during any year, such obligated entity shall purchase solar certificates to make up for such shortfall.

(3) If the quantum of renewable energy purchased from renewable energy sources other than solar sources, by an obligated entity falls short of its renewable energy purchase obligation from renewable energy sources other than solar sources, as provided in sub-regulation (1) of regulation 3, during any year, such obligated entity shall purchase non-solar certificates to make up for such shortfall:

Provided that the Commission may, on application from the obligated entity, grant in public interest, exemption from the sub-regulations (2) and (3) above, for good and sufficient reasons to be recorded in writing considering factors such as availability of renewable energy within the State for purchase, impact on tariff and vagaries of climate which are beyond the control of the obligated entity.

(4) Subject to such direction as the Commission may give from time to time, the obligated entity shall also be bound to act consistent with the provisions of the Central Electricity Regulatory Commission (Terms and Conditions for Recognition and Issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 as amended from time to time, for the procurement of the certificates for fulfillment of the renewable energy purchase obligation under these regulations.

(5) The certificates purchased by the obligated entities from the power exchange in terms of the Central Electricity Regulatory Commission (Terms and Conditions for Recognition and Issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 as amended from time to time as stipulated in sub-regulations (2) and (3) above shall be deposited by the obligated entities to the Commission in accordance with the detailed procedure approved by the Central Commission.

6. State Agency and its functions.- (1) A State Agency for accreditation as well as recommending the renewable energy projects for registration and for undertaking the functions under these regulations shall be designated by the Commission.

(2) The State Agency shall function in accordance with the directions issued by the Commission and shall be guided by the procedures and regulations specified by the Central Agency for discharge of its functions under the Central Electricity Regulatory Commission (Terms and Conditions for recognition and issue of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010.

(3) The State Agency shall submit quarterly status reports to the Commission in respect of compliance of renewable purchase obligation by the obligated entities in the format as stipulated by the Commission and may suggest appropriate action to the Commission if required, for the compliance of the renewable energy purchase obligation by the obligated entity.

(4) The Commission may from time to time fix the remuneration and charges payable to the State Agency for discharge of its functions under these regulations.

(5) If the Commission is satisfied that the State Agency is not able to discharge its functions satisfactorily, it may by general or special order, and by recording reasons in writing, designate any other agency to function as State Agency as it considers appropriate.

7. Effect of default.- (1) The obligated entity, which does not fulfill during any year, the renewable energy purchase obligation and does not purchase the certificates, as specified in these regulations, shall deposit into a separate fund namely,- Kerala State Renewable Energy Fund to be established and maintained by the Commission, such amount as the Commission may determine on the basis of the shortfall in units of renewable energy purchase obligation and the forbearance price as notified by the Central Commission:

Provided that, in the case of genuine difficulty in complying with the renewable purchase obligation, the obligated entity may apply to the Commission for permission to carry forward of compliance requirement to the next year and the Commission shall take appropriate decision on such application and communicate the same to the obligated entity within a period of sixty days from the date of receipt of such application.

(2) The obligated entity shall be in breach of its licence condition if it fails to deposit the amount as directed by the Commission under sub-regulation (1) above, within fifteen days of the communication of the direction.

(3) Where any obligated entity failed to comply with the obligation to purchase the required percentage of power from renewable energy sources or to purchase the renewable energy certificates, it shall also be liable for penalty as may be decided by the Commission under Section 142 of the Act:

Provided that where the Commission has consented to the carry forward the compliance requirement in accordance with the proviso under sub-regulation (1), the proceedings under sub-regulation (1) or sub-regulation (3) of this Regulation shall not be invoked.

8. Establishment of Kerala State Renewable Energy Fund by the Commission .-

(1) There shall be constituted a Fund to be called the Kerala State Renewable Energy Fund and there shall be credited thereto,-

- (a) any amount credited by the obligated entity under sub-regulation (1) of regulation (7) in accordance with the directions given by the Commission.
- (b) any grants or sum received for promotion of renewable energy in the State;
- (2) The fund so created shall be utilised, as may be directed by the Commission, for purchase of the renewable energy certificates or for purposes directed towards promotion of renewable energy in the State.
- (3) The Commission may empower an officer of the Commission or of the State Agency to procure from the power exchange the required number of certificates to the extent of the shortfall in the fulfillment of the obligations, out of the amount in the fund.

Chapter - III

Promotion of renewable sources of energy

9. Preferential tariff for renewable energy.- (1) The Commission may, on application or *suo motu*, fix preferential tariff for renewable energy generated from each category of renewable energy sources.

(2) The Commission may, be guided by the principles and methodologies, if any, specified by the Central Electricity Regulatory Commission (CERC), National Electricity Policy and Tariff policy, while deciding the terms and conditions for determination of tariff for energy from different categories of renewable energy sources.

10. Generation based incentive payable to the prosumer for the electricity generated from renewable energy sources.- The obligated entity shall grant, as ordered by the Commission, the generation based incentive to the prosumer for the electricity generated from renewable energy sources, whether grid connected or off grid.

11. Mandatory open access to renewable sources of energy.- Any person generating electricity from renewable sources of energy shall have mandatory open access to the transmission system or distribution system of any licensee.

12. Security mechanism for purchase of renewable energy.- (1) The obligated entity shall provide adequate payment security mechanism for purchase of renewable energy.

(2) If any obligated entity defaults in payment for the purchase of renewable energy from any generating unit, such generating unit shall be at liberty to sell, at the risk and cost of the defaulting obligated entity, the renewable energy to any other person and to avail open access for that purpose in accordance with the Kerala State Electricity Regulatory Commission (Open Access) Regulations, 2014.

13. Benefits for grid interactive distributed solar energy systems.- The prosumer shall be eligible for the benefits of banking, feed in tariff and such other benefits conferred under the provisions of KSERC (Grid Interactive Distributed Solar Energy Systems) Regulations, 2014.

Chapter - IV

Determination of Tariff for renewable energy

14. Determination of tariff for electricity from renewable energy sources.- (1)

The tariff for purchase of electricity from each category of renewable energy source shall be as determined by the Commission as specified in regulation 9.

(2) The Commission shall, after previous publication of the proposal to determine tariff for renewable energy, conduct public hearing on such proposal before determining the tariff for renewable energy.

(3) The Commission shall, from time to time, notify the norms for determination of tariff and the tariff for each category of renewable energy source.

(4) The tariff, as per the notification issued by the Commission, shall be applicable for the projects synchronized to grid after the date specified therein and shall continue in force till the useful life of the renewable energy project:

Provided that the tariff shall be applicable for all the projects synchronized to grid during the control period and the developers need not obtain separate approval from the Commission for applying such tariff for individual projects.

(5) The power purchase agreements (PPA) approved by the Commission prior to the notification of these regulations shall continue to be in force for such period as mentioned in the respective power purchase agreements.

(6) While determining the norms and tariff, the Commission shall consider appropriate operational and financial parameters of each category of renewable source and may, to the extent possible, provide an allowance based on technology, fuel, market risk, social and environmental benefits and such other factors.

15. Norms and control period for fixation of tariff.- (1) Norms and control period

for fixation of tariff for electricity from each category of renewable energy source shall be as specified in the annexures to these regulations, which may be amended, modified or substituted by notification issued by the Commission from the time to time after following the procedures of previous publication and public hearing:

Provided that the existing norms for fixation of tariff for electricity from renewable energy sources, shall continue till they are revised.

(2) Control period or review period during which the norms for determination of tariff specified in these regulations remain valid shall be three years of which the first year shall be the financial year 2015-16.

(3) On completion of the control period, the Commission may by notification, revise the norms for fixation of tariff.

(4) The tariff for the categories of renewable energy projects and the tariff period during which the tariff shall remain valid shall be as specified in the respective orders:

16. Effect of capital subsidy on the tariff of renewable energy.- The Commission shall make appropriate adjustments to the capital cost of the renewable energy project if any capital subsidy is availed for the implementation of such project.

17. Power to review the renewable purchase obligation and matters incidental thereto.- The Commission may review the renewable purchase obligation of the obligated entities and all the matters incidental thereto once in three years.

Chapter - V General

18. Sharing of clean development mechanism (CDM) benefits:- 1) The benefits if any, received from clean development mechanism or such other programmes shall be shared between generating company and distribution licensees which purchase renewable energy from the generating company, in the following manner,-

- (a) The entire benefits received from clean development mechanism or such other programmes during the first year after the date of the synchronization of the renewable energy projects to the distribution system, shall be retained by the generating company.
- (b) In the second year, ten percent of the benefits received from clean development mechanism or such other programmes shall be shared with the purchasers of renewable energy and in subsequent years the share of benefits allocated to the purchasers shall be progressively increased at a rate of ten percent per annum till the share reaches fifty percent and thereafter the benefits shall be shared equally by the generator and the purchaser of renewable energy.

19. Repeal and Savings.- (1) The following regulations are hereby repealed;

- (i) Kerala State Electricity Regulatory Commission (Power Procurement from Solar Plants by Distribution Licensees) Regulations, 2008;
- (ii) Kerala State Electricity Regulatory Commission (Renewable Purchase Obligation and its compliance) Regulations, 2010;
- (iii) Kerala State Electricity Regulatory Commission (Power Procurement from Renewable Sources by Distribution Licensees) Regulations, 2013;

(2) Notwithstanding such repeal, anything done or any action taken under the said regulation shall be deemed to have been done or taken under the corresponding provisions of this regulation.

20. Power to remove difficulties:- If any difficulty arises in giving effect to any of the provisions of these regulations, the Commission may by order, do anything not inconsistent with the provisions of the Act which appears to it to be necessary for the purpose of removing the difficulties.

Annexure A(2014-15)

Small hydro-electric projects having installed capacity of and above 5MW and up to and including 25MW

Sl. No.	Head	Sub-Head	Detailed head	Unit	Norm
1	Generation of power	Capacity	(i) Installed capacity	MW	1
			(ii) Capacity utilization factor	%	30%
			(iii) Auxiliary consumption	%	1%
			(iv) Useful life	Years	35
2	Project cost	Capital cost per MW	Power plant cost	Rs. lakh / MW	577.671
			Tariff period	Years	13
3	Source of fund	Debt-equity	(i) Debt	%	70%
			Moratorium period	Years	0
			Repayment period including moratorium period	Years	12
			Interest rate	%	12.70%
			(ii) Equity	%	30
			Return on equity (post tax)	%	16%
			For first ten years	% per annum	20%
			Return on equity 11 th year onwards	% per annum	24%
			Weighted average of ROE	%	22.86%
			Discount rate	%	10.67%
4	Financial	Tax	Income tax	%	33.990%
		Depreciation	Rate of depreciation for first 12 years	%	5.83%
			Rate of depreciation from 13 th year onwards	%	0.87%
5	Working capital	Fixed charges	O&M charges	month	1
			Maintenance spare	%	15%
			Receivables from debtors	month	2
			Interest on working capital	%	13.20%
6	Operation and Maintenance	O&M expenses		Rs. lakhs	15.65
		O&M escalation		%	5.72%

Levelised tariff Rs.4.47 / unit for 35 years

Annexure B(2014-15)
Small hydro-electric projects having installed capacity below 5MW

Sl. No.	Head	Sub-Head	Detailed head	Unit	Norm
1	Generation of power	Capacity	(i) Installed capacity	MW	1
			(ii)Capacity utilization factor	%	30%
			(iii)Auxiliary consumption	%	1%
			(iv)Useful life	Years	35
2	Project cost	Capital cost per MW	Power plant cost	Rs. lakh / MW	630.186
			Tariff period	Years	35
3	Source of fund	Debt-equity	(i) Debt	%	70%
			Moratorium period	Years	0
			Repayment period including moratorium period	Years	12
			Interest rate	%	12.70%
			(ii) Equity	%	30%
			Return on equity (post tax)	%	16%
			For first ten years	% per annum	20%
			Return on equity 11 th year onwards	% per annum	24%
4	Financial	Tax	Income tax	%	33.990%
			Depreciation	%	5.83%
			Rate of depreciation for first 12 years	%	0.87%
			Rate of depreciation from 13 th year onwards	%	0.87%
			Weighted average of ROE	%	22.86%
5	Working capital	Fixed charges	O&M charges	month	1
			Maintenance spare	%	15%
			Receivables from debtors	month	2
			Interest on working capital	%	13.20
6	Operation and Maintenance	O&M expenses	Rs. lakhs	22.35	
		O&M escalation	%	5.72%	

Levelised tariff Rs.5.25 / unit for 35 Years

Annexure C(2014-15)
Wind energy generation projects, located in wind zone - 1

Sl. No.	Head	Sub-Head	Detailed head	Unit	Norm
1	Generation of power	Capacity	(i) Installed capacity	MW	1
			(ii) Capacity utilization factor	%	20%
			(iii) Auxiliary consumption	%	0%
			(iv) Useful life	Years	25
2	Project cost	Capital cost per MW	Power plant cost	Rs. lakh / MW	603.929
			Tariff period	Years	13
3	Source of fund	Debt-equity	(i) Debt	%	70
			Moratorium period	Years	0
			Repayment period including moratorium period	Years	12
			Interest rate	%	12.70%
			(ii) Equity	%	30
			Return on equity (post tax)		
			For first ten years	% per annum	20%
			Return on equity 11 th year onwards	% per annum	24%
			Weighted average of ROE	%	22.40%
			Discount rate	%	10.67%
4	Financial	Tax	Income tax	%	33.990%
		Depreciation	Rate of depreciation for first 12 years	%	5.83%
			Rate of depreciation from 13 th year onwards	%	1.54%
5	Working capital	Fixed charges	O&M charges	month	1
			Maintenance spare	% of O&M	15%
			Receivables from debtors	month	2
			Interest on working capital	%	13.20%
6	Operation and Maintenance	O&M expenses (14-15)		Rs. lakhs	10.05
		O&M escalation		%	5.72%

Levelised tariff Rs.6.34 / unit for 25 years

Annexure D (2014-15)
Wind energy generation projects, located in wind zone - 2

Sl. No.	Head	Sub-Head	Detailed head	Unit	Norm
1	Generation of power	Capacity	(i) Installed capacity	MW	1
			(ii) Capacity utilization factor	%	22%
			(iii) Useful life	Years	25
2	Project cost	Capital cost per MW	Power plant cost	Rs. lakh / MW	603.929
			Tariff period	Years	0
3	Source of fund	Debt-equity	(i) Debt	%	70%
			Moratorium period	Years	30%
			Repayment period including moratorium period	Years	12
			Interest rate	%	12.70%
			(ii) Equity	%	30
			Return on equity (post tax)		
			For first ten years	% per annum	20%
			Return on equity 11 th year onwards	% per annum	24%
			Weighted average of ROE	%	22.40%
4	Financial	Tax	Discount rate	%	10.67%
			Income tax	%	33.990%
			Depreciation	%	5.83%
			Rate of depreciation for first 12 years	%	5.83%
			Rate of depreciation from 13 th year onwards	%	1.54%
5	Working capital	Fixed charges	O&M charges	Months	1
			Maintenance spare	% of O&M	15%
			Receivables from debtors	Month	2
			Interest on working capital	%	13.20%
6	Operation and Maintenance	O&M expenses	Rs lakhs / MW	10.05	
		O&M escalation	%	5.72%	

Levelised tariff Rs.5.76 / unit for 25 years.

Annexure E(2014-15)
Wind energy generation projects, located in wind zone - 3

Sl. No.	Head	Sub-Head	Detailed head	Unit	Norm
1	Generation of power	Capacity	(i) Installed capacity	MW	1
			(ii)Capacity utilization factor	%	25%
			(iii)Useful life	Years	25
2	Project cost	Capital cost per MW	Power plant cost	Rs. lakh / MW	603.929
			Tariff period	Years	13
3	Source of fund	Debt-equity	(i) Debt	%	70%
			Moratorium period	Years	0
			Repayment period including moratorium period	Years	12
			Interest rate	%	12.70%
			(ii) Equity	%	30
			Return on equity (post tax)		
			For first ten years	% per annum	20%
			Return on equity 11 th year onwards	% per annum	24%
			Weighted average of ROE	%	22.40%
			Discount rate	%	10.67%
4	Financial	Tax	Income tax	%	33.990%
			Depreciation	%	5.83%
			Rate of depreciation from 13 th year onwards	%	1.54%
5	Working capital	Fixed charges	O&M charges	Months	1
			Maintenance spare	% of O&M	15%
			Receivables from debtors	Month	2
			Interest on working capital	%	13.20%
6	Operation and Maintenance	O&M expenses	Rs. Lakhs / MW	10.05	
		O&M escalation	%	5.72%	

Levelised tariff Rs.5.07 / unit for 25 years.

Annexure F(2014-15)
Solar photo voltaic energy generation projects

Sl. No.	Head	Sub-Head	Detailed head	Unit	Norm
1	Generation of power	Capacity	(i) Installed capacity	MW	1
			(ii)Capacity utilization factor	%	19%
			(iii)Auxiliary consumption	%	0.00%
			(iv)Useful life	Years	25
2	Project cost	Capital cost per MW	Power plant cost	Rs. lakh / MW	691
			Tariff period	Years	25
3	Source of fund	Debt-equity	(i) Debt	%	70%
			Moratorium period	Years	0
			Repayment period including moratorium period	Years	12
			Interest rate	%	12.70%
			(ii) Equity	%	30
			Return on equity (post tax)		
			For first ten years	% per annum	20%
			Return on equity 11 th year onwards	% per annum	24%
			Weighted average of ROE	%	22.40%
			Discount rate	%	10.67%
4	Financial	Tax	Income tax	%	33.990%
		Depreciation	Rate of depreciation for first 12 years	%	5.83%
			Rate of depreciation from 13 th year onwards	%	1.54%
5	Working capital	Fixed charges	O&M charges	Month	1
			Maintenance spare	% of O&M	15%
			Receivables from debtors	Month	2
			Interest on working capital	%	13.20%
6	Operation and Maintenance	O&M expenses		Rs. Lakhs	12.30
		O&M escalation		%	5.72%

Levelised tariff Rs.7.72/ unit for 25 years

Annexure A(2015-16)

Small hydro-electric projects having installed capacity of and above 5MW and up to and including 25MW

Sl. No.	Head	Sub-Head	Detailed head	Unit	Norm
1	Generation of power	Capacity	(i) Installed capacity	MW	1
			(ii) Capacity utilization factor	%	30%
			(iii) Auxiliary consumption	%	1%
			(iv) Useful life	Years	35
2	Project cost	Capital cost per MW	Power plant cost	Rs. lakh / MW	592.586
			Tariff period	Years	13
3	Source of fund	Debt-equity	(i) Debt	%	70%
			Moratorium period	Years	0
			Repayment period including moratorium period	Years	12
			Interest rate	%	13%
			(ii) Equity	%	30
			Return on equity (post tax)	%	16%
			For first ten years	% per annum	20%
			Return on equity 11 th year onwards	% per annum	24%
			Weighted average of ROE	%	22.86%
			Discount rate	%	10.81%
4	Financial	Tax	Income tax	%	33.990%
		Depreciation	Rate of depreciation for first 12 years	%	5.83%
			Rate of depreciation from 13 th year onwards	%	0.87%
5	Working capital	Fixed charges	O&M charges	month	1
			Maintenance spare	%	15%
			Receivables from debtors	month	2
			Interest on working capital	%	13.50%
6	Operation and Maintenance	O&M expenses	Rs. lakhs	16.54	
		O&M escalation	%	5.72%	

Levelised tariff Rs.4.65 / unit for 35 years

Annexure B (2015-16)
Small hydro-electric projects having installed capacity below 5MW

Sl. No.	Head	Sub-Head	Detailed head	Unit	Norm
1	Generation of power	Capacity	(i) Installed capacity	MW	1
			(ii)Capacity utilization factor	%	30%
			(iii)Auxiliary consumption	%	1%
			(iv)Useful life	Years	35
2	Project cost	Capital cost per MW	Power plant cost	Rs. lakh / MW	646.458
			Tariff period	Years	35
3	Source of fund	Debt-equity	(i) Debt	%	70%
			Moratorium period	Years	0
			Repayment period including moratorium period	Years	12
			Interest rate	%	13%
			(ii) Equity	%	30%
			Return on equity (post tax)	%	16%
			For first ten years	% per annum	20%
			Return on equity 11 th year onwards	% per annum	24%
4	Financial	Tax	Income tax	%	33.990%
			Depreciation	%	5.83%
			Rate of depreciation for first 12 years	%	0.87%
			Rate of depreciation from 13 th year onwards	%	0.87%
			Weighted average of ROE	%	22.86%
5	Working capital	Fixed charges	O&M charges	month	1
			Maintenance spare	%	15%
			Receivables from debtors	month	2
			Interest on working capital	%	13.50
6	Operation and Maintenance	O&M expenses	Rs. lakhs	23.63	
		O&M escalation	%	5.72%	

Levelised tariff Rs.5.47 / unit for 35 Years

Annexure C (2015-16)

Wind energy generation projects, located in wind zone - 1

Sl. No.	Head	Sub-Head	Detailed head	Unit	Norm
1	Generation of power	Capacity	(i) Installed capacity	MW	1
			(ii) Capacity utilization factor	%	20%
			(iii) Auxiliary consumption	%	0%
			(iv) Useful life	Years	25
2	Project cost	Capital cost per MW	Power plant cost	Rs. lakh / MW	619.522
			Tariff period	Years	13
3	Source of fund	Debt-equity	(i) Debt	%	70
			Moratorium period	Years	0
			Repayment period including moratorium period	Years	12
			Interest rate	%	13%
			(ii) Equity	%	30
			Return on equity (post tax)		
			For first ten years	% per annum	20%
			Return on equity 11 th year onwards	% per annum	24%
			Weighted average of ROE	%	22.40%
			Discount rate	%	10.81%
4	Financial	Tax	Income tax	%	33.990%
		Depreciation	Rate of depreciation for first 12 years	%	5.83%
			Rate of depreciation from 13 th year onwards	%	1.54%
5	Working capital	Fixed charges	O&M charges	month	1
			Maintenance spare	% of O&M	15%
			Receivables from debtors	month	2
			Interest on working capital	%	13.50%
6	Operation and Maintenance	O&M expenses (14-15)		Rs. lakhs	10.63
		O&M escalation		%	5.72%

Levelised tariff Rs.6.58 / unit for 25 years

Annexure D (2015-16)
Wind energy generation projects, located in wind zone - 2

Sl. No.	Head	Sub-Head	Detailed head	Unit	Norm
1	Generation of power	Capacity	(i) Installed capacity	MW	1
			(ii) Capacity utilization factor	%	22%
			(iii) Useful life	Years	25
2	Project cost	Capital cost per MW	Power plant cost	Rs. lakh / MW	619.522
			Tariff period	Years	0
3	Source of fund	Debt-equity	(i) Debt	%	70%
			Moratorium period	Years	30%
			Repayment period including moratorium period	Years	12
			Interest rate	%	13%
			(ii) Equity	%	30
			Return on equity (post tax)		
			For first ten years	% per annum	20%
			Return on equity 11 th year onwards	% per annum	24%
			Weighted average of ROE	%	22.40%
			Discount rate	%	10.81%
4	Financial	Tax	Income tax	%	33.990%
		Depreciation	Rate of depreciation for first 12 years	%	5.83%
			Rate of depreciation from 13 th year onwards	%	1.54%
5	Working capital	Fixed charges	O&M charges	Months	1
			Maintenance spare	% of O&M	15%
			Receivables from debtors	Month	2
			Interest on working capital	%	13.50%
6	Operation and Maintenance	O&M expenses (FY15-16)		Rs lakhs / MW	10.63
		O&M escalation		%	5.72%

Levelised tariff Rs.5.98 / unit for 25 years.

Annexure E (2015-16)
Wind energy generation projects, located in wind zone - 3

Sl. No.	Head	Sub-Head	Detailed head	Unit	Norm
1	Generation of power	Capacity	(i) Installed capacity	MW	1
			(ii) Capacity utilization factor	%	25%
			(iii) Useful life	Years	25
2	Project cost	Capital cost per MW	Power plant cost	Rs. lakh / MW	619.522
			Tariff period	Years	13
3	Source of fund	Debt-equity	(i) Debt	%	70%
			Moratorium period	Years	0
			Repayment period including moratorium period	Years	12
			Interest rate	%	13%
			(ii) Equity	%	30
			Return on equity (post tax)		
			For first ten years	% per annum	20%
			Return on equity 11 th year onwards	% per annum	24%
			Weighted average of ROE	%	22.40%
			Discount rate	%	10.81%
4	Financial	Tax	Income tax	%	33.990%
			Depreciation	%	5.83%
			Rate of depreciation for first 12 years	%	1.54%
5	Working capital	Fixed charges	O&M charges	Months	1
			Maintenance spare	% of O&M	15%
			Receivables from debtors	Month	2
			Interest on working capital	%	13.50%
6	Operation and Maintenance	O&M expenses	Rs. Lakhs / MW	10.63	
		O&M escalation	%	5.72%	

Levelised tariff Rs.5.27 / unit for 25 years.

Annexure F (2015-16)
Solar photo voltaic energy generation projects

Sl. No.	Head	Sub-Head	Detailed head	Unit	Norm
1	Generation of power	Capacity	(i) Installed capacity	MW	1
			(ii)Capacity utilization factor	%	19%
			(iii)Auxiliary consumption	%	0.00%
			(iv)Useful life	Years	25
2	Project cost	Capital cost per MW	Power plant cost	Rs. lakh / MW	587.33
			Tariff period	Years	25
3	Source of fund	Debt-equity	(i) Debt	%	70%
			Moratorium period	Years	0
			Repayment period including moratorium period	Years	12
			Interest rate	%	13%
			(ii) Equity	%	30
			Return on equity (post tax)		
			For first ten years	% per annum	20%
			Return on equity 11 th year onwards	% per annum	24%
	Weighted average of ROE	%	22.40%		
	Discount rate	%	10.81%		
4	Financial	Tax	Income tax	%	33.990%
		Depreciation	Rate of depreciation for first 12 years	%	5.83%
			Rate of depreciation from 13 th year onwards	%	1.54%
5	Working capital	Fixed charges	O&M charges	Month	1
			Maintenance spare	% of O&M	15%
			Receivables from debtors	Month	2
			Interest on working capital	%	13.50%
6	Operation and Maintenance	O&M expenses(2015-16)		Rs. Lakhs	13.00
		O&M escalation		%	5.72%

Levelised tariff Rs.6.86 / unit for 25 years