

THE HIMACHAL PRADESH ELECTRICITY REGULATORY COMMISSION, SHIMLA

Subject:- Determination of generic levelled tariffs for Small Hydro Projects under Regulation 13 of the Himachal Pradesh Electricity Regulatory Commission (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2012.

The Commission notified the Himachal Pradesh Electricity Regulatory Commission (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2012, on 17th December, 2012 in the Rajpatra Himachal Pradesh (herein after referred to as "RE Tariff Regulations"), which have come into force from 18th December, 2012.

Sub-regulation(1) of Regulation 13, read with Regulations 32, of the RE Tariff Regulations provide that the Commission shall determine separate generic levelled tariffs and associated terms and conditions for each category of SHPs within 90 days from the date of commencement of the said Regulations by taking into account the norms specified thereunder. Accordingly, the Commission has worked out the tariff and associated terms and conditions as detailed here under.

Comments and suggestions of the stakeholders on the above proposal are invited by 1st March, 2013 so that the comments and suggestions so received are also considered, while finalizing the tariff and the associated terms and conditions. .

GENERIC LEVELLED TARIFFS FOR SMALL HYDRO PROJECTS (SHPs)

1. The proposed generic levelled tariffs and associated terms & conditions for various categories of Small Hydro Projects in respect of the control period (18.12.2012 upto 31.03.2017) have been computed in accordance with the RE Tariff Regulations as discussed in the following paragraphs:-

USEFUL LIFE

2. Clause (aa) of sub-Regulation(1) of Regulation 2 of the RE Tariff Regulations specifies that the 'useful life' in relation to a SHP shall mean a duration of 40 years from the date of commencement of operation of the project.

CONTROL PERIOD OR REVIEW PERIOD

3. Regulation 9 of the RE Tariff Regulations provides that the control period for determination of tariff for SHPs shall start from 18th day of December, 2012 and shall end on the 31st day of the March, 2017. In accordance with sub-regulation (2) thereof the tariff(s) determined under these Regulations for the renewable energy generation project(s) or for a category thereof, to which these regulations are applicable, shall,

unless amended or revised under Regulation 19, continue to be applicable till the expiry of the tariff period as specified in Regulation 10.

TARIFF PERIOD

4. In terms of Regulation 10 of the RE Tariff Regulations, the tariff period of 40 years has been considered for working out the generic levelled tariffs for various categories of SHPs.

TARIFF STRUCTURE

5. Regulation 11 of the RE Tariff Regulations stipulates that single part levelled tariff structure comprising of the following fixed cost components shall be followed in case of SHPs.
- (a) Return on equity;
 - (b) Interest on loan capital;
 - (c) Depreciation;
 - (d) Interest on working capital; and
 - (e) Operation and maintenance expenses.

LEVELLED TARIFF

6. The generic tariff shall be determined on levelled basis for the tariff period as per sub-regulation(3) of Regulation 11 of the RE Tariff Regulations.

DEBT EQUITY RATIO

7. The normative debt equity ratio has been considered as 70:30 in accordance with Regulation 22 of the RE Tariff Regulations.

CAPITAL COST

8. The per MW capital costs for various categories of SHPs have been considered in accordance with Regulation 33 of the RE Tariff Regulations which stipulates that, in case of SHPs, the normative capital cost inclusive of all its components as specified in Regulation 20 of the RE Tariff Regulations, for the control period shall be as under:-

S.No.	Category of Small Hydro Project	Rupees in Lac per MW
(i)	Above 100 kW to 2 MW capacity	780
(ii)	Above 2 MW to 5 MW capacity	750
(iii)	Above 5 MW to 25 MW capacity	700

RETURN ON EQUITY

9. Regulation 25 of the RE Tariff Regulations provide that the value base for the equity shall be 30% of the normative capital cost as determined under Regulation 20 and that the normative return on equity shall be -

- (a) 19% per annum for the first 10 years.
- (b) 22% per annum from 11th year onwards.

The return on equity has accordingly been considered at the above rates.

INTEREST ON LOAN

10. Sub-regulation (2) of Regulation 23 of the RE Tariff Regulation provides that the loan tenure of 12 years is to be considered for the purpose of determination of Tariff for RE projects. Sub-regulation (2) of said regulation provides for commutation of rate of interest of loan as under:

“(2) Interest Rate:-

- (a) *The loan arrived at in the manner indicated in Regulation 22 shall be considered as gross normative loan for calculation for interest on loan. The normative loan outstanding as on April 1st of every financial year shall be worked out by deducting the cumulative repayment, inclusive of the prepayment, upto March 31st of the previous financial year from the gross normative loan on normative basis.*
- (b) *For the purpose of computation of tariff, the Average of State Bank of India Base rate(s) prevalent during a period of 6 months preceding the date of commencement of these Regulations, plus 300 basis points shall be considered as the normative interest rate.*
- (c) *Notwithstanding any moratorium period availed by the renewable energy generator, the repayment of loan shall be considered from the first year of the tariff period and shall be equal to the annual depreciation allowed.*
- (d) *The loan repayment for a financial year or the relevant part period thereof shall be considered to have been done in the middle of that financial year or the relevant part period thereof, as the case may be”.*

11. In view of above, interest rate of 12.875% per annum has been worked out by the adding 300 basis points to the average State Bank of India(SBI) Base rate for a period of six months preceding the date of commencement of the RE Tariff Regulations, as shown in the table below:

Period from	Period to	Base rate
13 th August,2011	-----	10.00%
20 th September,2012	Till Date	9.75%
Average Base rate for six months preceding the date of commencement of the RE Tariff Regulations.		9.875%

Source; State Bank of India (www.statebankofindia.com)

DEPRECIATION

12. Regulation 24 of the RE Tariff Regulations provides as under: For the purpose of tariff determination, depreciation shall be computed in the following manner, namely:-

“(a) the value base for the purpose of depreciation shall be the normative capital cost (for generic tariff) or the capital cost of the project as admitted by the Commission (for project specific tariff), as the case may be;

(b) the salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the asset;

(c) depreciation per annum shall be based on ‘Differential Depreciation Approach’. For tariff purposes, the depreciation shall be allowed @ 5.83 % per annum till such time the requirement for repayment of loan component of the capital cost as per Regulations 20, 22 and 23 after adjusting the amount of subsidy as per Regulation 21, is fully provided and the remaining depreciation shall be spread over the residual useful life of the project on straight line method;

(d) depreciation shall be chargeable from the first year of commencement of operation of the project:

13. In accordance with the above, the rate of depreciation has been considered as 5.83% per annum for meeting the requirements of loan repayment (after adjusting the subsidy component) and balance amount of depreciation has been equally spread over the remaining tariff period. For the year in which the loan gets totally repaid, the depreciation has been provided to the extent of the actual requirement for loan repayment or the average value of balance period whichever is higher.

INTEREST ON WORKING CAPITAL

14. In accordance with the Regulation 26 of the RE Tariff Regulations, for the working capital requirement of the SHPs has been considered including by the following:-

- (a) Operation and maintenance expenses for one month;
- (b) Receivables equivalent to 2 (two) months of energy charges for sale of electricity calculated on the net saleable energy corresponding to the CUF considered for tariff determination on normative basis;
- (c) Maintenance spare @ 15% of operation and maintenance expenses.

15. The interest on working capital has been considered at average interest rate equivalent of SBI Base Rate(s) prevalent during the period of 6 months preceding the date of commencement of RE Tariff Regulations, plus 350 basis points. The annual rate of interest has been computed as 13.375%.

OPERATION AND MAINTENANCE EXPENSES

16. In accordance with regulation 38 of RE Tariff Regulations, the normative annual O&M expenses for the first year of the tariff period have been considered as under:-

S.No.	Category of Project	Annual O&M expenses Rupees in Lac per MW
(i)	Above 100 kW to 2 MW capacity	25
(ii)	Above 2 MW to 5 MW capacity	22
(iii)	Above 5 MW to 25 MW capacity	18

17. These normative O&M expenses have been escalated at the rate of 5.72% per annum over the tariff period in accordance with the Regulation 27 of the RE Tariff Regulations.

SUBSIDY OR INCENTIVE OR GRANT/ BUDGETARY SUPPORT BY THE CENTRAL/STATE GOVERNMENT

18. The sub-regulation(1) of Regulation 21 of the RE Tariff Regulations provides as under:

“(1) While determining the generic levelled or project specific levelled tariff, as the case may be, for the renewable energy project(s) under these Regulations, the Commission shall take into consideration any incentive and/or subsidy and/or grant available under the schemes of the Central or State Government or its agencies, including accelerated depreciation benefit under the Income Tax Act:

Provided that for tariff determination, 90% of the capital subsidy available to the project as per applicable scheme of the MNRE/ State Government shall be considered:

Provided further that the Commission may evolve suitable mechanisms for incorporating impact of the subsidy component for determination or adjustment of generic levelled tariffs for various categories of projects.

Provided further that the capital subsidy under the schemes of the Central or State Government or its agencies, shall, unless the circumstances otherwise warrant, be ordinarily adjusted against the principal component of the loan amount as additional reduction apart from the normal payment:

.....XXXXXXXX.....”

19. In accordance with sub-regulation(3) of Regulation 21 of RE Tariff Regulations the amount of subsidy shall be considered for each renewable source as per the applicable policy of the MNRE/State Government and if the amount and/or mechanism of subsidy is changed by the MNRE/State Government, consequent corrections in tariffs may be carried out by the Commission in accordance with regulation 19 of RE Tariff Regulations.
20. In accordance with the prevalent scheme of MNRE, the SHPs in private sector are entitled to capital subsidy at the following rates.

Areas	Upto 1000kW	Above 1MW & upto 25MW
N.E. States, J & K H.P. & Utrakhand (Special Category States)	Rs. 20,000 per kW	Rs. 2.00 Crores for 1 st MW + Rs. 30 Lacs for each additional MW.

The per MW capital subsidy for SHPs of various capacities have been worked out on this basis and is attached at Appendix-D. It is observed that the per MW rate of capital subsidy for various capacities of SHPs reduces progressively as the capacity increases but this reduction is not in a linear ratio. The per MW capital subsidy, as computed for 1MW, 2MW and 5MW SHPs, have been considered for working out the generic levellised tariffs for the SHPs under category –I , II and III respectively. However, since this methodology may deprive the SHPs of higher capacities in each category of full benefit of 10% of subsidy intended to be allowed to be retained by them, suitable formulae have been evolved for increasing the generic levellised tariff so as to compensate such SHPs suitably to a reasonable degree of approximation. These formulae have been evolved by evaluating the difference between the generic levellised tariff corresponding to the lowest & highest MW capacities under each category of SHPs and the corresponding difference in 90% of the capital subsidy per MW in accordance with Col-4 of Appendix-D. The relevant formulae have been given in sheet-VI of the respective appendices relating to tariff computation for various categories of SHPs (i.e. Appendix-A, B and C) as well as in para-30. These formulae shall, however not be applicable in cases where the adjustments on account of grant of budgetary support or generation based incentive, if any, or the additional MNRE subsidy to Govt. sector project are involved. In such cases the adjustment shall be made on case to case basis in accordance with Regulation 21 of the RE Tariff Regulations.

NORMATIVE NET SALEABLE ENERGY

21. The annual normative net saleable energy at the interconnection point has been computed in line with the provisions of Regulation 34 of the RE Tariff Regulations which specify that the normative annual capacity utilization factor (CUF) for all the SHPs upto 25MW shall be 55% and also stipulates the procedure for computing the normative year wise net saleable energy. The normative auxiliary consumption and transformation losses has been taken @ 1% of the gross generation as per regulation 36 and the energy losses in the project line have been taken as 0.7% of the net generation as per Regulation 37. The free power structures as discussed in para-24 have been taken into account. Every fourth year has been considered as a leap year.

FREE POWER (ENERGY) STRUCTURE AND ADJUSTMENT IN TARIFF FOR VARIATIONS

- 22. The sub-regulation(1) of Regulation 35 of the RE Tariff Regulations stipulates that the Commission shall consider appropriate structure(s) of free power for determination of generic levellised tariffs for various categories of SHPs, duly keeping in view the provisions of the State Hydro Policy for allotment of sites for SHPs, National Hydro Policy, Tariff Policy and the limits specified under sub-regulation(3):
- 23. In accordance with clause (iii) of sub-regulation(1) of Regulation 34 and sub regulation(3) of Regulation 35 of the RE Tariff Regulations, the free energy to be taken into account for any part of the tariff period shall not exceed 13% free energy, which includes 12% free power to the Home State and 1% additional free power for local area, development fund as stipulated in National Hydro Policy/Tariff Policy.
- 24. Based on above and the free power structure presently being followed by the State Government, the generic levellised tariffs for various categories of SHPs have been computed by accounting for free energy, as per following structure.

S.No.	Category of Small Hydro Project	Free Power Structure
(i)	Above 100 kW to 2 MW capacity	7% for first 12years and 13% for the remaining 28 years.
(ii)	Above 2 MW to 5 MW capacity	7% for first 12years and 13% for the remaining 28 years.
(iii)	Above 5 MW to 25 MW capacity	13% for the entire tariff period of 40 years.

- 25. In case where the free power structure applicable for a SHP for which power purchase agreement (PPA) is to be approved by the Commission is different from that considered in the tariff, the generic levellised tariff for such a project shall be computed by adjusting the generic levellised tariff determined by the Commission in inverse proportion to the levellised values of net saleable energy under two structures i.e. by multiplying the generic levellised tariff of that category by the corresponding levellised net saleable energy (per annum per MW) as per the sheet-II of the tariff calculations of respective categories and dividing the same with the levellised net saleable energy (per annum per MW) worked out at discount rate of 10.58% per annum, corresponding to the permissible free power structure for which the levellised tariff is to be computed for inclusion in the PPA to be approved by the Commission. It shall be ensured that free power (energy) to be accounted for in the

tariff does not exceed the permissible limits, as specified in the RE Tariff Regulations during any part of the tariff period. However, for any variations in the structure of free energy after execution of PPA, the adjustments shall be computed in accordance with other relevant provisions of the RE Tariff Regulations.

DISCOUNT FACTOR

26. In accordance with sub-Regulation(4) of Regulation 11 of the RE Tariff Regulations, the discount factor equivalent to the post tax weighted average cost of capital considered for the purpose of levellised tariff computation. The discount factor has been calculated on this basis by following the normative debt: equity ratio (70:30). For this purposes, the interest rate for the loan component (i.e. 70%) of Capital Cost has been considered as 12.875% (as explained in para 11) which has been adjusted for the corporate tax. For equity component (i.e. 30% of the capital cost) the post tax ROE has been computed 14.95% by adjusting the normative ROE of 19% per annum for first 10 years with MAT and 22% per annum. for the remaining period with corporate tax. The rates for MAT & Corporate tax have been taken as 18.5% and 30% respectively. The surcharge and education cess have also been considered @ 5% and 3% respectively for such computations. Based on above, the annual discount rate has been calculated as 10.58%.

ACCELERATED DEPRECIATION BENEFIT

27. The sub-regulation 4 and 5 of Regulation 21 of the RE Tariff Regulations provide as under:-

“(4)The Commission shall determine two generic levellised tariffs or project specific levellised tariffs, as the case may be, one by considering accelerated depreciation and the other without it, and the tariff to any renewable energy generator shall be applicable as provided in succeeding sub-regulation(5):

Provided that for ascertaining income tax benefits on account of accelerated depreciation for the purpose of tariff determination-

- (a) assessment of benefit shall be based on normative capital cost or the cost admitted, as the case may be, accelerated depreciation rate, as per relevant provisions under the Income Tax Act and the Corporate Tax rate;*
- (b) in case of generic levellised tariff, capitalisation of renewable energy projects shall be considered during second half of the financial year and in case of project specific levellised tariff, the expected date of commencement of operation of the project shall be considered;*
- (c) per unit benefit shall be derived on levellised basis at the discount factor equivalent to the post tax weighted average cost of capital.*

(5) It shall be assumed that the renewable energy generator shall avail the benefit of accelerated depreciation and accordingly the tariff, which

accounts for the accelerated depreciation, shall be applicable unless the renewable energy generator establishes, to the satisfaction of the distribution licensee, that he has not availed or is not entitled to such a benefit.”

28. For the purpose of determining net depreciation benefits, depreciation @ 5.28% as per straight line method (Book depreciation as per Companies Act,1956) has been compared with depreciation as per Income Tax rate i.e. 80% of the written down value method. Moreover, additional 20% depreciation in the initial year is extended to new assets acquired by power generation companies vide amendment in section 32, sub-section(1) clause (ii a) of the Income Tax Act. The tax benefit on this account has been computed at applicable Income Tax rate @32.445%(30% IT rate +5% surcharge +3%). Since the capitalisation is to be considered in the second half of year, only 50% of these depreciation values have been considered in the first year. The energy for the second half of the year which mainly comprises of winter months with lean discharges has been taken as 30% of the annual generation. The discount factor has also been averaged out by considering blocks of 6 months. Moreover since only 50% values of depreciation have been considered in the first year, the shortfall has been considered in the last (41st) year.

ROUNDING

29. The two tariffs (with and without accelerated depreciation) worked out for various categories of SHPs are proposed to be rounded to nearest paise/kWh. The fraction of 0.5 paise/kWh of above has been rounded to next higher and fraction of less than 0.5 has been ignored.

GENERIC LEVELLISED TARIFF AND ASSOCIATED TERMS & CONDITIONS

30. In light of the discussion made in the preceding paragraphs, the generic levellised tariffs and the associated terms and conditions for various categories of SHPs are proposed to be determined as under:-

(A) The generic levellised tariffs for various categories of SHPs shall be as under:

Category	Capacity	Generic Levellised Tariff in Rs./kWh of net saleable energy.	
		Without Accelerated Depreciation	With Accelerated Depreciation
Col.1	Col. 2.	Col. 3.	Col. 4
I	Above 100 kW to 2 MW	3.34	3.04
II	Above 2 MW to 5 MW	3.27	2.98
III	Above 5 MW to 25 MW	3.17	2.89

Note: The tariff with Accelerated Depreciation (Col.4) shall be applicable for the respective categories unless the renewable energy generator establishes, to the satisfaction of the distribution licensee that he has not availed or not entitled to such a benefit.

(B) The tariff applicable as per A above shall be subject to adjustments as applicable for relevant category of SHPs in accordance with the following paragraphs (a) to (c):

(a) Adjustment on account of differential rate of capital subsidy and grants, budgetary support and Generation based Incentives.

Category-I (Above 100 kW to 2 MW Capacity)

Sr. No.	Description	Increase in Paise/kWh on account of differential rate of capital subsidy
(i)	If the capacity is more than 100kW but does not exceed 1000kW.	No Increase
(ii)	If the capacity is more than 1000 KW but does not exceed 2000kW.	$=16/76.50*(180-“Y”)Paise/Kwh$

Category-II(Above 2 MW to 5 MW Capacity)

Sr. No.	Description	Increase in Paise/kWh on account of differential rate of capital subsidy
(i)	If the capacity is more than 2000kW but does not exceed 5000kW.	$=10/45.90*(103.5-“Y”)Paise/kWh$

Category-III (Above 5 MW to 25 MW Capacity)

Sr. No.	Description	Increase in Paise/kWh on account of differential rate of capital subsidy
(i)	If the capacity is more than 5000kW but does not exceed 25000kW.	$=6/24.48*(57.60-“Y”)Paise/kWh$

In all above cases, “Y”= 90% of the capital subsidy/MW as per Col-4 of Appendix-D for the project for which Generic Levellised Tariff is to be determined.

Note: The adjustments on account of grant or budgetary support and the generation based incentive if any, shall be made separately on case to case basis in-accordance with the Regulation 21 of the RE Tariff regulations. Similarly the adjustments on account of additional MNRE subsidy to Government Sector Projects shall also be made separately on

case to case basis. The formulae given in this para(B) above shall not be applicable in any of such cases.

(b) Variation in free power structure:

The above tariffs account for free energy at the following rates.

Sr. No.	Category of Small Hydro Project	Free Power Structure
(i)	Above 100 kW to 2 MW capacity	7% for first 12years and 13% for the remaining 28 years.
(ii)	Above 2 MW to 5 MW capacity	7% for first 12years and 13% for the remaining 28 years.
(iii)	Above 5 MW to 25 MW capacity	13% of the entire tariff period of 40 years.

In case the structure of free power applicable for a SHP for which the PPA is to be approved by the Commission is different from that considered in the tariff for that category of SHPs, the adjustment shall be carried out in accordance with the para 25. However, it shall be ensured that free power(energy) to be accounted for in the tariff does not exceed the permissible limits, as specified in RE Tariff Regulations during any part of the tariff period. The adjustment if required, on this account shall, be carried out after carrying out the adjustment(s), if any, under para(a) above.

(c) Rounding: The tariff worked out after carrying out the adjustments on the above lines shall be rounded to the nearest Paisa. The fraction of 0.5 and above shall be rounded to the next higher value and the fraction of less than 0.5 shall be ignored.

(C) These tariffs shall be subject to the RE Tariff Regulations and the orders as may be issued by the Commission thereunder.

31. The detailed computations for generic levellised tariff for the SHPs under the three categories (I,II and III) as well as illustrations thereof are enclosed as per Appendices A,B and C respectively.

**Shimla:
Dated:04.02.2013**

**Sd/-
Secretary
HPERC**