

**HIMACHAL PRADESH ELECTRICITY REGULATORY COMMISSION, SHIMLA**

Petition No.:70/2017(Suo-Motu)

**CORAM**

**Sh. S.K.B.S. Negi**

**Chairman**

**Sh. Bhanu Pratap Singh**

**Member**

Date of order: 24.03.2018

**IN THE MATTER OF**

**Determination of generic levellised tariffs for Small Hydro Projects under Regulation 14 of the Himachal Pradesh Electricity Regulatory Commission (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2017.**

**ORDER**

1. The Commission notified, after prior publication, the Himachal Pradesh Electricity Regulatory Commission (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2017, on 23<sup>rd</sup> November, 2017 in the Rajpatra Himachal Pradesh (hereinafter referred to as “RE Tariff Regulations, 2017”), which have come into force from 1<sup>st</sup> October, 2017.
2. Sub-regulation (1) of Regulation 14, read with Regulations 33, of the RE Tariff Regulations, 2017, provides that the Commission shall determine separate generic levellised tariffs and associated terms and conditions for each category of the Small Hydro Projects (in brevity SHPs) within 90 days from the date of commencement of the said Regulations by taking into account the norms specified thereunder.
3. Accordingly, the Commission worked out the proposed levellised tariffs and associated terms and conditions for various categories of SHPs on 7<sup>th</sup> December, 2017 and invited the public objections and suggestions upto 28<sup>th</sup> December, 2017 on the proposed levellised tariff for SHPs by way of insertions in two Newspapers i.e. “The Tribune” and “Himachal Dastak” on 9<sup>th</sup> December, 2017 and also by way of making the Tariff proposals available on the Commission’s website. The Commission, vide letter dated 12.12.2017, also requested the major stakeholders, including Industries Associations, State Government, Directorate of Energy, Distribution Licensee, Hydro Power Producers Associations and HIMURJA, to send their objections/suggestions as per the aforesaid public notice. In response to the same, written comments/suggestions were received from the following stakeholders:

- (i) M/s Puri Oil Mills Limited, 302, Jyoti Shikhar, District Centre, Janakpuri, New Delhi-11058.
- (ii) M/s Jaya Hydro Power Pvt. Ltd. & M/s Leond Hydro Pvt. Ltd., Skipton Villa, the Ridge, Shimla- 171001(HP).
- (iii) M/s Yogindera Powers Ltd., Vill & PO. Jalari, Tehsil Kangra -176038 (HP).
- (iv) The Himalaya Power Producers Association, B-7, Sector-1, Phase-1, Main Road, New Shimla- 171009.

4. Whereas the stakeholders enlisted at Sr. No. (i) to (iii) in para 3 made comments on the proposal, the Himalaya Power Producers Association, submitted that they are in the process of deliberations with HP Government regarding certain Hydro Power Policy interventions in the matter of revival of the Small Hydro Power Sector in the State and since a new government has recently taken over in the State, the final decision regarding the policy review can take a little more time. It was further mentioned that the Association intends to have detailed discussion on the Hydro Power Policy with the Power Department, immediately after the then upcoming Assembly Session and hopes that some policy directives shall be decided in the next cabinet meeting likely during in the second fortnight of January, 2018. In view of above, the Association requested for postponement of the hearing scheduled for 05.01.2018.
5. Taking into consideration the request made by the Association, the Commission re-scheduled the hearing on the subject matter for 20.01.2018 and also again invited the fresh/additional public objections and suggestions by way of insertions in two News papers i.e. "The Tribune" and "Danik Bhaskar" on 03.01.2018 and extended the date for filing objections/ suggestions upto 15.01.2018. A public hearing was held on 20.01.2018. The list of participants who attended the public hearing on 20.01.2018 is annexed at Annexure-"A". In the said hearing while some of the participants reiterated the issues raised by them in their written submissions, some others made only general comments.
6. Apart from the comments received as per para 3 to 5, including those expressed in the hearing held on 20.01.2018, certain additional comments were also received from various stakeholders at various subsequent stages. The Commission observes that most of the comments/suggestions relate to fixation of normative parameters which in fact have already been finalized as a part of the Regulations and do not form the subject matter of the proposal presently under consideration i.e. determination of generic levelled tariffs and associated terms and conditions for each category of SHPs taking into account the norms specified in the RE Tariff Regulations, 2017. Such comments were in fact duly considered at the time of finalization of the Regulations. Even though

the comments of this nature may not merit consideration, the Commission has consolidated such comments also. The comments received, including those expressed in the public hearing, have been discussed in the following sub-paras:

### **6.1 Issues raised by the Consumers' Representative:**

**(a)** Shri Charanjeet Singh (Advocate), Consumers Representative, has submitted that since the normative parameters regarding tariff determination for small hydro projects have already been fixed in the RE Tariff Regulations, 2017, there is no need to change the norms as suggested by some of the stakeholders. However, he made the following points:

- (i)** According to the Tariff Policy, any procurement of power from SHP of capacity above 2.00 MW should be on competitive bidding basis.
- (ii)** Since there is no binding upon HPSEBL for procurement of power from SHP above 2.00 MW, there may be chance of pick and choose by the HPSEBL while entering into PPA with IPPs, in absence of clear guidelines.
- (iii)** There should be a provision of determination of project specific levelled tariff.
- (iv)** The consumers' representative further stated that keeping in view the cost of renewable energy power available in the market, the tariff proposed by the Commission should be attractive and on lower side for the Discom. The time and cost over-runs are main issues of delays in commissioning of projects and should be curbed.

### **(b) Commission's view:-**

The matter under consideration pertains to the determination of tariff as per the provisions of Regulations in force and the HPSEBL is expected to use its prudence and adopt uniform transparent criteria while identifying the SHPs with whom PPAs are to be executed. The Regulations neither mandate the Discom to necessarily purchase power from IPPs nor in anyway debar the HPSEBL to procure power through competitive bidding. As regards the suggestion for including provision for project specific tariff determination, it is clarified that adequate provisions in this regard have already been provided in the RE Tariff Regulations, 2017. Moreover, the broad principles to be adopted for dealing with delays in case of project specific determination have also been enshrined in the Regulations.

## **6.2 Control Period or Review Period.-**

### **(a) M/s Jaya Hydro Power Pvt. Ltd. and M/s Leond Hydro Power Pvt. Ltd. have submitted as under:-**

The Control period of the Regulations, 2012 was up to 31<sup>st</sup> March 2017 and thereafter a transition period of six months was provided for framing of the revised Regulations but their date of coming into force was 1<sup>st</sup> April, 2017 because these regulations itself state that normative are subject to change as per revised Regulations. Hence, their date of applicability should be 1<sup>st</sup> April and not 1<sup>st</sup> October as notified in the Regulations, 2017. Control period for Regulations, 2017 should be from 1<sup>st</sup> April, 2017 because year is defined as financial year and the normative applied for this control period exists from the day one of the financial year. Furthermore, the earlier control period expired on 31.03.2017 and extension order itself states that the normative are subject to change as per new regulations. The date of effectiveness of Regulations, 2017 may please be changed to 1<sup>st</sup> April, 2017.

### **(b) Commission's view:**

As per the RE Regulations, 2012, as amended by Notification dated 31<sup>st</sup> March, 2017, the control period for the SHPs under the said Regulations of 2012 extends upto 30.09.2017. As such the comment is not based on facts.

## **6.3 Capital cost.-**

### **(a) M/s Jaya Hydro Power Pvt. Ltd. and M/s Leond Hydro Power Pvt. Ltd. have submitted as under:-**

- (i) Capital cost for the control period has been fixed ranging from Rs. 800 Lacs to Rs.880 Lacs per MW as per its installed capacity whereas even today completion cost of small hydro projects of any installed capacity is more than Rs.10 Crore per MW. The capital cost defined in the Regulations is based on wrong facts, false assumptions and conjecture leading to the disincentive for implementation of the small hydro projects;
- (ii) The actual capital cost for small hydro projects upto 2.00 MW at present in coming more than Rs. 10 Crore per MW and thus Normative Capital Cost needs upward revision in Regulations, 2017. Furthermore the cost difference between project upto 2.00 MW and 5.00 MW capacity has cost difference of about Rs. 1.5 Crore per MW but these Regulations provide a cost difference of Rs. 80 Lacs only between these two categories of the small hydro projects. Normative cost of hydro projects upto 2.00 MW capacity needs to be kept more than Rs. 10 Crore per MW.

**(b) M/s Yogindera Powers Ltd. has submitted as under:-**

The capital cost per MW considered by the Commission for capacity above 2 MW to 5 MW capacity is Rs. 850 Lacs per MW. This cost is too low. Even CERC its recent Regulation, 2017 has accepted a cost of Rs. 1000 Lacs per MW. In actual this cost varies from Rs. 1200 to Rs. 1500 Lacs per MW. Therefore cost of Rs.8.50 Lacs per MW is not only less but very low. In present scenario when the inputs material are taxed at 18% GST and no Modvat are available to Hydro Power Developers, the cost has further increased. Therefore, the Commission has to take a realistic figure so that the Developers are able to recover their investment.

**(c) Commission's view:**

The Commission has already specified the normative capital costs for the various categories of the SHPs in the RE Regulations, 2017. The tariffs have accordingly to be determined on the basis of the capital cost so specified.

**6.4 Subsidy/Incentives.-**

**(a) M/s Jaya Hydro Power Pvt. Ltd. and M/s Leond Hydro Power Pvt. Ltd. have submitted as under:-**

Scheme for subsidy has been notified by the MNRE, Govt. of India to take into account the cost overruns in the small hydro projects and it is a compensation for higher cost against the normative. Therefore, it should not be taken into consideration for determination of the tariff for small hydro projects.

**(b) M/s Puri Oil Mills has submitted as under:-**

There is no Small Hydro Programme prescribed by the MNRE as on the date for the projects, which are to be commissioned after 01.04.2017. In view of the same, an amount of Rs. 75 Lakhs per MW related to MNRE subsidy as mentioned in the Appendix C Sheet-I (i.e. Tariff for SHPs above 5.00 MW to 25.00 MW (at 5.00 MW) of the order dated 07.12.2017 proposal should be ignored, while determining the generic levelled tariff and kindly make necessary corrections in the same accordingly, since there in no capital subsidy programme announced by the MNRE for FY 2017-18 as on the date.

**(c) Commission's view:**

The RE Regulations, 2017 clearly stipulate that 75% of the capital subsidy as per the applicable scheme of MNRE/State Government shall be considered for tariff determination. The plea to not to adjust the same in tariff calculation is therefore, not acceptable.

As regards the suggestion of the stakeholder that the capital subsidy should not be considered in this tariff order, as the same has not been decided by the MNRE for FY 2017-18 and onwards, the Commission observes that in view of the special provisions in the RE Regulations, 2017, there may hardly be any SHPs which may be covered under the MNRE scheme applicable for the period prior to 01.04.2014 and most of the SHPs covered in these tariffs shall fall in the July, 2014 scheme of MNRE. As such, for the time being, the formula for adjustment of subsidy shall be determined only in relation to the July, 2014 scheme of MNRE and the same shall be applicable only for applying these tariffs in cases covered under capital subsidy scheme issued by MNRE in July, 2014. These formulas shall not be applicable in cases covered under any other subsidy schemes. In relation to any future scheme of MNRE from 2017-18 and onwards, the Commission shall formulate separate mechanism based on rate applicable under such scheme(s) as & when MNRE issues such scheme(s) or the Commission otherwise finds it necessary to do so. Needless to mention, if the rate of subsidy under such future scheme(s) are reduced to zero for any category, the mechanism to be determined in relation to such scheme shall account for the same suitability. This has also discussed in the para 7.13(b).

## **6.5 Return on Equity.-**

### **(a) M/s Jaya Hydro Power Pvt. Ltd. and M/s Leond Hydro Power Pvt. Ltd. have submitted as under:-**

- (i) Return on the equity is defined as 17% percent but lower capital cost defined in Regulation 34 reduces it to about 5% only. Thus this provision does not satisfy the actual condition and violate the spirit of Section 61 of the Electricity Act, 2003.
- (ii) Normative for the capital cost of the project has been fixed on the lower side and this leads to reduction in return on equity from 17% to about 9%. By taking into account income tax this return further reduces to about 5-6% only. Thus the projects become non-bankable and cannot attract loans/funds from the financial institutions.

### **(b) Commission's view:**

The normative capital cost as well as ROE has already been specified in the Regulations after considering various aspects and the comment made in this regard are not a subject matter of the process under consideration.

## **6.7 Rate of Interest on loan.-**

**(a) M/s Jaya Hydro Power Pvt. Ltd. and M/s Leond Hydro Power Pvt. Ltd. have submitted as under:-**

Rate of Interest on loan is adopted as 10% whereas IREDA provides loan @ 13% thus profitability of the projects is affected. Rate of interest @10% shall adversely affect the commercial viability of the projects.

**(b) M/s Yogindera Powers Ltd. has submitted as under:-**

The Commission has considered normative interest rate of 200 basis points above the average State Bank of India MCLR. This has been worked out as 10% per annum. Hydro Projects are not being given loans at these rates. The banks are funding Hydro Projects at interest rates varying from 11.5% to 13% and therefore the Rate of Interest considered is less. It has to be increased.

**(c) Commission's view:**

The RE Regulations, 2017, provide for normative interest rate of 200 points above the average State Bank of India MCLR rate, which is also in line with the CERC Regulations.

## **6.8 Operation and maintenance.-**

**(a) M/s Jaya Hydro Power Pvt. Ltd. and M/s Leond Hydro Power Pvt. Ltd. have submitted as under:-**

Operation and maintenance charges for projects having capacity upto 2.00 MW are on the lower side since minimum staff has to be kept in three shifts at various locations for operation of the project. For projects upto 2.00MW capacity, this amount should be increased at least by 33%. However, since the staff required for operation of 2 MW and 5 MW is almost the same and there is not large difference between these two categories of the projects for operation and maintenance purpose, the O&M expenses for project upto 2 MW may be provided as Rs. 45 Lakh per MW.

**(b) M/s Yogindera Powers Ltd. has submitted as under:-**

The Commission has considered Rs.29 lacs per MW towards O&M expenses for projects above 2MW to 5MW. It is a known fact that O&M expenses are higher in Small Hydro Projects. Small Hydro Projects are also liable to be subjected to harsh weather condition. The electro mechanical equipment can suffer major faults due to flash flood, debris etc. In hilly areas, SHP schemes have run of river, during monsoon season the water

contains silt/debris which causes heavy abrasion to the turbines casing and veins etc.

Most of the Hydro power sites are in remote places away from main towns. Heavy expenses are incurred in commuting from these towns to the project sites. Further the staff has to be employed and given accommodation for staying, their food & lodging, site conveyance expenses. All these expenses they look very small but when we sum them up on an annual basis they also become a sizeable amount. The figure considered by the Commission is not sufficient to cover the O&M expenses. These need to be rechecked and considered appropriately.

**(c) Commission's view:**

The rate of O&M charges have already been specified in the Regulations and have to be accounted for accordingly.

**6.9 Depreciation.-**

**(a) M/s Jaya Hydro Power Pvt. Ltd. and M/s Leond Hydro Power Pvt. Ltd. have submitted as under:-**

Depreciation has been taken on lower side since life of some of the electrical equipment varies from 10 years to 15 years in respect of control panel, switchyard equipments, batteries etc., the stakeholder further referred the normative provided by the CEA for calculating the depreciation of the project. The salvage value shall be taken as NIL because project is returned to the State Government free of cost after 40 years and no salvage value is being given by the Government.

**(b) Commission's view:**

The rates of depreciation as well as the salvage value have already been specified in the Regulations and shall be taken into consideration accordingly.

**6.10 Depreciation and Loan Repayment Period:**

**(a) M/s Puri Oil Mills has submitted as under:-**

- (i) The rate of depreciation should be considered as 5.28% during the loan tenure i.e. 13 years but while calculating the generic levelled tariff for category-III (above 5.00 MW to 25.00 MW), the Commission has considered 12 years. In view of above, the depreciation tenure should be taken as 13 years instead of 12 years, while determining generic levelled tariff.



**(b) Commission's view:**

In accordance with the RE Regulations, 2017, the depreciation at the differential rate of 5.28% per annum is to be allowed for tariff purposes only for meeting the requirement of loan repayment, adjusted for capital subsidy. Since, the requirement for repayment of loan gets fully provided earlier than the outer limit of 13 years, the said period of 13 years has got curtailed accordingly. This has also discussed in the para 7.10(b).

**6.11 Normative Net Saleable Energy.-**

**(a) M/s Yogindera Powers Ltd. has submitted as under:-**

The Commission has considered normative annual capacity utilization factor as 55%. This figure is very high. In the CERC RE Regulations, 2017, the CUF has been considered as 45% whereas in Uttarakhand it has been considered as 40%. The figure of 55% is very high and in most of the cases it is not achievable thus resulting in under realization for the projects. The CUF must be fixed at 40% as considered in Uttarakhand which is also a hill state so that the developers are able to get proper recovery of their investments.

**(b) M/s Jaya Hydro Power Pvt. Ltd. and M/s Leond Hydro Power Pvt. Ltd. have submitted as under:-**

Normative saleable energy for the purpose of generic levelled tariff has been computed with normative capacity utilisation factor as 55% but the analysis of small hydro projects implemented in the State shows that average capacity utilization factor in the small hydro projects is less than 50% only in the State. Normative capacity utilization factor may be considered as 50% only.

**(c) Commission's view:-**

The normative CUF has been specified in the Regulations and has to be accounted for accordingly. As a matter of fact, the justification for adopting a marginally higher CUF as compare to that adopted by CERC was also duly elaborated at the time of finalizing the Regulations. It is also worth mentioning that whereas the CERC specified by the CUF is net of free power, the RE Regulations, 2017 specify the CUF on gross basis.

**6.12 Free (Royalty) Power.-**

**(a) M/s Yogindera Powers Ltd. have submitted as under:-**

The Commission has considered the State royalty of 7% for the initial 12 years of the project and 13% for the balance life, whereas, the Implementation Agreements is being signed with the Himachal Pradesh

Government has higher State royalty. The stakeholder has quoted his own project case where the royalty is 7% for the first 12 years, 16% for next 18 years and 25% for balance life of the project.

**(b) M/s Jaya Hydro Power Pvt. Ltd. and M/s Leond Hydro Power Pvt. Ltd. have submitted as under:-**

The free power should be adopted as per the policy of the State Government and as provided in the IA because after 12 years of operation, the percentage of free power increases substantially.

**(c) M/s Puri Oil Mills has submitted as under:-**

The formula pertaining to free power should be clearly explained in an understandable form on case to case basis and the prescribed free power for each projects should be factored in while determining the generic levelled tariff.

**(d) Commission's view:**

- (i) The quantum (rate) of free power eligible for pass through in the tariff has been specified in the Regulations and the matter has to be dealt accordingly.
- (ii) As regards the suggestion to explain the formula on case to case basis and the prescribed free power for each project(s), the Commission observes that the similar provisions existed in the RE Regulations, 2012 also and the same read with the Tariff Order under those Regulations provide adequate clarity. No instance relating to difficulty in implementation has been brought to the notice of the Commission. The Commission is however otherwise not averse to provide more clarity wherever required.

**6.13 Energy losses.-**

**(a) M/s Jaya Hydro Power Pvt. Ltd. and M/s Leond Hydro Power Pvt. Ltd. have submitted as under:-**

Energy losses in the project are minimum 1.00 % at power station for small hydro projects as per CEA norms, in addition 2.00 % transmission losses are provided upto interconnection point. Therefore, 3.00 % losses may please be considered upto interconnection point while determining the tariff for small hydro projects.

Energy losses in the project transmission line has been provided as 0.7% only in the Regulations whereas now average length of transmission line is more than 4 Km leading to higher energy losses. Central Electricity

Authority also allows transmission losses as 2.00% upto saleable point. The energy losses in transmission may be kept as 2.00%.

**(b) Commission's view:**

The losses to be accounted for on normative basis have already been specified in RE Regulations, 2017 and shall be accounted for accordingly.

**6.14 Special provisions for Small Hydro Projects.-**

**(a) M/s Jaya Hydro Power Pvt. Ltd. and M/s Leond Hydro Power Pvt. Ltd. have submitted as under:-**

- (i) The regulation 11 of RE Tariff Regulations, 2017 links control period of the IA first signed which is not based on correct premise because signing of IA does not indicate the commissioning date of the project. Only after obtaining statutory clearances, one can start the construction of the project and it is seen that minimum 4-5 years time is being taken for obtaining of statutory clearances. Construction period of the project is 2-3 years; therefore date of IA should be about eight years before of the applicability of these regulations or the Regulations, 2017 should be linked to date of obtaining all the statutory clearances or the commercial operation date of the project. The regulation 11 of RE Tariff Regulation, 2017 in present form hinders the development to the small hydro projects and project developers shall be put into heavy financial losses if this article is not deleted or modified.
- (ii) Special Provision for Small Hydro Projects” should be deleted since it debars the IPPs who have signed the IA before 1<sup>st</sup> January, 2015 from the applicability of RE Tariff Regulations, 2017. This provision puts the burden of delay wholly on the IPPs, whereas, most of the delays are caused by bureaucratic hurdles, complicated procedures in various departments, local problems, change in Rules by various departments after regular intervals etc. Thus regulation 11 makes all these small hydro projects uneconomic and unviable leading to huge losses to these small hydro power developers. The regulation 11 may be deleted.

**(b) M/s Yogindera Powers Ltd. has submitted as under:-**

As per the mandate provided under Section 86(1) (e) of the Electricity Act, 2003, the State Commission requires to promote co-generation and generation of electricity from renewable sources of energy. The new Regulations should be available to all generators of electricity with whom no long term arrangements have been done/approved by the Commission till date. They must be allowed the prevailing Regulations which are

applicable at the time when they desire to enter into long term agreement with Himachal Pradesh State Electricity Board Limited.

**(c) Commission's view:**

The applicability of tariff is to be regulated as per the provisions of RE Regulations, 2017, which have already been notified. The present proposal relates to determination of tariff as per the provisions of said Regulations. As such the comment being made here is not relevant in the context of present proposal.

**6.15 Interest on working capital.-**

**(a) M/s Jaya Hydro Power Pvt. Ltd. and M/s Leond Hydro Power Pvt. Ltd. have submitted as under:-**

Interest on working capital should be adopted as per CERC Regulations. MCLR has recently been reduced because of Demonetization but this rate shall again increase after few years. Therefore for considering MCLR, the average of last five years rate shall be considered for interest on working capital.

**(b) Commission's view:**

The principles for determination on the interest on working capital have already been specified in the Regulations and have to be followed accordingly. As a matter of fact, these provisions are similar to those appearing in CERC Regulations.

**6.16 General Comments:-**

**(a)** Sh. Ajay Vaidya, Advocate has requested that the public hearing process as well as determination of SHP tariff by this regulatory process may be postponed as the State Government may notify the new and/or amend the existing State Hydro Policy.

**(b)** The representative of HPSEBL has stated that the State Government may require to take pro-active action for the revival of hydro sector particularly SHPs and that the HPSEBL is also required to devise the ways to switch over to 100% green energy portfolio by suitably reallocating its thermal power share from the total energy portfolio.

**(c)** The State Government i.e. Department of MPP & Power vide letter No. MPP-F(1)-1/2005-IV dated 12.02.2018 had conveyed that as per the deliberation in the meeting with Bonafide Himachali Power Producers Association on 09.02.2018, many issues and grievances has been raised by the Power Producers on which State Government intends to take holistic view by way of re-examining the State Power Policy, 2006. It has

been further requested to pend the tariff determination process or start the process de-novo in due course of time.

**(d) Commission's view:**

The Commission observes that the stakeholders including SHP developers and State Government, are in favour of review of the Hydro Policy of the State Government. The Commission is also not averse to such review by the State Government and shall, while framing future regulations, duly take into account the relevant provisions of the Policy as and when the same are reviewed, by the State Government. Accordingly, keeping in view the basic intent of the communication received from the State Government and also having understood that the State Government intends to re-examine the State Hydro Policy, on priority, the Commission may restrict the applicability clause of RE Tariff Regulations, 2017 as well as the control period for SHPs thereunder to a cutoff date earlier than what has been specified in the existing Regulations. The Commission may, after considering the matter separately, initiate suitable action to amend the RE Tariff Regulations, 2017. However, keeping in view the facts that Regulations which have already been notified after following the due process cannot be amended retrospectively and also to facilitate continuity of the control period under the regulatory system, the Commission feels that for the time being, the tariff shall have to be determined as per the provisions of the RE Tariff Regulations, 2017 and the Commission is duly bound to do so as per the provision of the said Regulations.

It is also worth-mentioning that in the event of amendment of Regulations, as indicated above, the applicability of tariff being determined in this order shall automatically be limited to the amended control period as may be specified in the amendment Regulations.

**7. DETERMINATION OF GENERIC LEVELLISED TARIFFS.-**

In light of discussion made in the preceding paragraphs, the Commission now proceeds further to determine the generic levellised tariffs and associated terms and conditions for the three categories i.e. above 100 kW to 2.00 MW capacity (category-I), above 2.00 MW to 5.00 MW capacity (category-II) and above 5.00 MW to 25.00 MW capacity (category-III) of Small Hydro Projects for the control period starting from 01.10.2017 under the RE Regulations, 2017.

### **7.1 Useful Life.-**

Clause (ac) of sub-regulation (1) of regulation 2 of the RE Tariff Regulations, 2017 specifies that the 'useful life in relation to SHP shall mean a duration of 40 years from the date of commencement of operation of the project.

### **7.2 Control Period or Review Period.-**

The control period for determination of tariff for SHPs shall start from 1<sup>st</sup> October, 2017 and shall be coterminous with the control period specified in the RE Regulations, 2017 read with amendments, if any, as may be made from time.

### **7.3 Tariff Period.-**

In terms of regulation 10 of the RE Tariff Regulations, 2017, the tariff period of 40 years has been considered for working out the generic levelled tariffs for various categories of SHPs.

### **7.4 Tariff Structure.-**

The Commission has followed the tariff structure as per regulation 12 of the RE Tariff Regulation, 2017 which 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.

### **7.5 Levelled Tariff.-**

The generic tariff has been determined on levelled basis for the tariff period as per sub-regulation (3) of the regulation 12 of the RE Tariff Regulations, 2017.

### **7.6 Debt Equity Ratio.-**

The normative debt equity ratio has been considered as 70:30 in accordance with regulation 23 of the RE Tariff Regulations, 2017.

### **7.7 Capital Cost.-**

The per MW capital costs for various categories of SHPs have been considered in accordance with regulation 34 of the RE Tariff Regulations, 2017 which stipulates that, in case of SHPs, the normative capital cost inclusive of all its components as specified in regulation 21 of the RE Tariff Regulations, 2017, for the control period shall be as under:-

| Sr. No. | Category of small hydro project | Rupees in Lac per MW |
|---------|---------------------------------|----------------------|
| (i)     | Above 100 kW to 2 MW capacity   | 880                  |
| (ii)    | Above 2 MW to 5 MW capacity     | 850                  |
| (iii)   | Above 5 MW to 25 MW capacity    | 800                  |

## 7.8 Return on Equity.-

Regulation 26 of the RE Tariff Regulations, 2017 provides that the value base for the equity shall be 30% of the normative capital cost as determined under regulation 21 and that the normative return of equity has been considered as 17% per annum on pre tax basis.

## 7.9 Interest on Loan.-

(a) The sub-regulation (1) of regulation 24 of the RE Tariff Regulation, 2017 provides that the loan tenure of 13 years, inclusive of moratorium period, if any, is to be considered for the purpose of determination of tariff for RE projects. Sub-regulation (2) of the said regulation provides for computation of rate of interest of loan as under:-

### “(2) Interest Rate.-

(a) *The loans arrived at in the manner indicated in the regulation 23 shall be considered as gross normative loan for calculation for interest on loan. The normative loan outstanding as on 1<sup>st</sup> April of every year shall be worked out by deducting the cumulative repayment upto 31<sup>st</sup> March of previous year from the gross normative loan.*

(b) *For the purpose of computation of tariff(s) under these Regulations, normative interest rate of two hundred (200) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one year tenor) prevalent during the last available six months, prior to the respective date(s) from which such tariff(s), or the respective generic levellised tariffs are to be made applicable, shall be considered:*

*Provided that in case where project specific tariff .....*

(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) *Apart from the adjustment of subsidy in accordance with regulation 22, 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.”*

(c) In view of above, interest rate of 10.00% per annum has been worked out by the adding 200 basis points above the average of Marginal Cost of Funds based Lending Rate (MCLR) (one year tenor) of State Bank of India (SBI) prevalent during the last available six months preceding the date of commencement of the RE Tariff Regulations, 2017, as shown in the table below:-

| Month                                    | Tenor-wise MCLR of SBI |
|--|------------------------|
| April, 2017                              | 8.00                   |
| May, 2017                                | 8.00                   |
| June, 2017                               | 8.00                   |
| July, 2017                               | 8.00                   |
| August, 2017                             | 8.00                   |
| September, 2017                          | 8.00                   |
| <b>Avg. for last available 6 months.</b> | <b>8.00</b>            |

### 7.10 Depreciation.-

(a) Regulation 25 of the RE Tariff Regulations, 2017 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 @ 5.28% per annum till such time the requirement for repayment of loan component of the capital cost as per regulations 21, 23 and 24 after adjusting the amount of subsidy as per regulation 22, 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.”*

(b) In accordance with the above, the rate of depreciation has been considered as 5.28% 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 for balance period whichever is higher.

### 7.11 Interest on working capital.-

(a) In accordance with the regulation 27 of the RE Tariff Regulations, 2017, the working capital requirement of the SHPs has been considered by including 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.”*



- (b) Interest rate on working capital as 11.00% per annum has been worked out by the adding 300 basis points above the average of Marginal Cost of Funds based Lending Rate (MCLR) (one year tenor) of State Bank of India (SBI) prevalent during the last available six months preceding the date of commencement of the RE Tariff Regulations, 2017.

**7.12 Operation and Maintenance Expenses.-**

- (a) In accordance with regulation 39 of RE Tariff Regulations, 2017, the normative annual O&M expenses for the first year of the tariff period have been considered as under:-

| Sr. No. | Category of Project           | Annual O&M expenses<br>Rupees in Lac per MW |
|---------|-------------------------------|---|
| (i)     | Above 100 kW to 2 MW capacity | 33  |
| (ii)    | Above 2 MW to 5 MW capacity   | 29  |
| (iii)   | Above 5 MW to 25 MW capacity  | 24  |

- (b) 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 28 of the RE Tariff Regulations, 2017.

**7.13 Subsidy or incentive or grant/budgetary support by the Central/ State Government.-**

- (a) The sub-regulation (1) of regulation 22 of the RE Tariff Regulations, 2017 provides as under:-

*“(1) While determining the generic levellised or project specific levellised 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, but excluding accelerated depreciation benefit under the Income Tax Act:*

*Provided that for tariff determination, only 75% 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 mechanism(s) for incorporating impact of the subsidy component for determination or adjustment of generic levellised 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 in the middle of first 12 months from the commencement of the tariff period against the principal component of the loan amount as additional reduction apart from the normal payment:*

*.....xxxxxx.....”*

- (b) In accordance with sub-regulation (3) of regulation 22 of RE Tariff Regulations, 2017, 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 20 of the RE Tariff Regulations, 2017.

- (c)** The Commission observes that in view of the special provisions in the RE Regulations, 2017, there may hardly be any SHPs which may be covered under the MNRE scheme applicable for the period prior to 01.04.2014 and most of the SHPs covered in these tariffs shall fall in the July, 2014 scheme of MNRE. As such, for the time being, the formula for adjustment of subsidy shall be determined only in relation to the July, 2014 scheme of MNRE and the same shall be applicable only for applying these tariffs in cases covered under capital subsidy scheme issued by MNRE in July, 2014. These formulae shall not be applicable in cases covered under any other subsidy schemes. In relation to any future scheme(s) of MNRE for FY 2017-18 and onwards, the Commission shall formulate separate mechanism based on rate applicable under such scheme(s) as & when MNRE issues such scheme(s) or the Commission otherwise finds it necessary to do so. Needless to mention, if the rate of subsidy under such scheme(s) are reduced to zero for any category, the mechanism to be determined in relation to such scheme shall account for the same suitability.
- (d)** In view of the above, the Commission has taken into account the rates as per the aforesaid communication of 2<sup>nd</sup> July, 2014 cases. In accordance with the prevalent scheme of MNRE dated 2<sup>nd</sup> July, 2014, the SHPs in private, cooperative and joint sector etc. are entitled to capital subsidy at the following rates:-

| Category   | Above 0.1 MW - 25 MW  |
|--|---|
| N.E. States, J&K, HP & Uttrakhand (Special States) | Rs. 1.5 Crore per MW limited to Rs. 5.00 Crore per project. |

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 increase but this reduction is not in a linear ratio. The per MW capital subsidy, as computed for 1 MW, 2 MW and 5 MW SHPs have been considered for working out the generic levelled 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 25 % of subsidy intended to be allowed to be retained by them, suitable formulae have been evolved for increasing the generic levelled 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 levelled tariff corresponding to the lowest & highest MW capacities under each category of SHPs and the corresponding difference in 75% of the capital subsidy per MW in accordance with Col-4 of Appendix-D. As per para-9, the relevant formulae have been given in Sheet-IV of the respective appendices relating to tariff computation for various categories of SHPs (i.e. Appendix-A, B and C).

- (e) These formulae shall, however not be applicable in cases where the adjustment of account 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 22 of the RE Tariff Regulations, 2017.

#### **7.14 Normative Net Saleable Energy.-**

The annual normative net saleable energy at the interconnection point has been computed in line with the provisions of regulation 35 of the RE Tariff Regulations, 2017 which specify that the normative annual Capacity Utilisation Factor (CUF) for all the SHPs upto 25 MW 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 37 and the energy losses in the project line have been taken as 0.7% of the net generation as per regulation 38. The free power structure as discussed in para-7.15 have been taken into account. Every fourth year has been considered as a leap year.

#### **7.15 Free power (Energy) structure and adjustment in tariff for variations.-**

- (a) The sub-regulation (1) of regulation 36 of the RE Tariff Regulations, 2017 stipulates that the Commission shall consider appropriate structure(s) of free power for determination of generic levelled 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).
- (b) In accordance with clause (iii) of sub-regulation (1) of regulation 35 and sub-regulation (3) of regulation 36 of the RE Tariff Regulations, 2017, the free energy to be taken into account for any part of the tariff period shall not exceed 13.00% (free energy), which includes 12.00% free power to the

Home State and 1.00% additional free power for local area development fund as stipulated in National Hydro Policy/ Tariff Policy.

- (c) Based on above and the free power structure presently being followed by the State Government, the generic levelled tariffs for various categories of SHPs have been computed by accounting for free energy, as per following structure:-

| <b>Sr. No.</b> | <b>Category of small hydro project</b> | <b>Free power structure</b>                                |
|----------------|--|--|
| (i)            | Above 100 kW to 2 MW capacity          | 3% for first 12 years and 13% for the remaining 28 years.  |
| (ii)           | Above 2 MW to 5 MW capacity            | 7% for first 12 years and 13% for the remaining 28 years . |
| (iii)          | Above 5 MW to 25 MW capacity           | 13% for the entire tariff period of 40 years               |

- (d) 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 levelled tariff for such a project shall be computed by adjusting the generic levelled tariff determined by the Commission in inverse proportion to be levelled values of net saleable energy under two structure i.e. by multiplying the generic levelled tariff of that category by the corresponding levelled 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 levelled net saleable energy (per annum per MW) worked out at discount rate of 8.64% per annum, corresponding to the permissible free power structure for which the levelled tariff is to be computed for inclusion in the PPA to be approved by the Commission. It shall be ensured that the free power (energy) to be accounted for in the tariff does not exceed the permissible limits, as specified in the RE Tariff Regulations, 2017 during any part of the tariff period. However, for any variations in the structure of free energy after approval/execution of PPA, the adjustment shall be computed in accordance with other relevant provision of the RE Tariff Regulations, 2017.

#### **7.16 Discount Factor.-**

In accordance with sub-regulation (4) of regulation 12 of the RE Tariff Regulations, 2017, the discount factor equivalent to the post tax weighted average cost of capital considered for the purpose of levelled tariff computation. The discount factor has been calculated on this basis by following the normative debt equity ratio (70:30). For this purpose, the interest rate for the loan component (i.e. 70%) of capital cost has been

considered as 10.00% 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 as 13.56% by adjusting the normative RoE of 17.00% per annum with Average MAT rate of 20.26% per annum, as considered by CERC also, has been followed. The discount factor has been calculated as 8.64%. The Corporate tax has been taken as 34.61% (30% IT rate+ 12% Surcharge+ 3% Education cess).

### 7.17 Rounding.-

The tariffs worked out for various categories of SHPs are proposed to be rounded to nearest paise/kWh. The fraction of 0.5 paise/kWh or above has been rounded to next higher and fraction of less than 0.5 has been ignored.

## 8. GENERIC LEVELLISED TARIFF AND ASSOCIATED TERMS AND CONDITIONS.-

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 have been 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. |
|----------|-------------------------------|--|
| Col. 1   | Col. 2                        | Col.3  |
| (i)      | Above 100 kW to 2 MW capacity | 3.79   |
| (ii)     | Above 2 MW to 5 MW capacity   | 3.61   |
| (iii)    | Above 5 MW to 25 MW capacity  | 3.44   |

B. The tariff applicable as per A above shall be subject to adjustment 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.

(i) The adjustment on account of capital subsidy shall be carried out as per the following formulae:

#### Category –I (Above 100 kW to 2 MW Capacity)

| Description                                    | Increase in Paise/kWh on account of differential rate of capital subsidy |
|--|--|
| If the capacity is more than 100 kW to 2000 kW | No increase  |

#### Category –II (Above 2 MW to 5 MW Capacity)

| Description  | Increase in Paise/kWh on account of differential rate of capital subsidy |
|--|--|
| If the capacity is more than 2000 kW but does not exceed 5000 kW | $=7/37.50 * (112.5 - "Y")$ Paise/kWh                                     |

**Category –III (Above 5 MW to 25 MW Capacity)**

| Description   | Increase in Paise/kWh on account of differential rate of capital subsidy |
|---|--|
| If the capacity is more than 5000 kW but does not exceed 25000 kW | $=10/60 * (75 - "Y")$ Paise/kWh  |

In all above cases, “Y”=75% 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 above formulae for adjustment of subsidy shall be determined only in relation to the July, 2014 scheme of MNRE and the same shall be applicable only for applying these tariffs in cases covered under capital subsidy scheme issued by MNRE in July, 2014. These formulas shall not be applicable in cases covered under any of the subsidy schemes for any future schemes.

- (ii) In relation to any other scheme of MNRE including future scheme of MNRE from 2017-18 to onwards, the Commission shall formulate separate mechanism based on rate applicable under such scheme(s) as & when MNRE issues such scheme(s) or the Commission otherwise finds it necessary to do so. Needless to mention, if the rate of subsidy under such scheme(s) are reduced to zero for any category, the mechanism to be determined in relation to such scheme shall account for the same suitability.
- (iii) The adjustment 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 22 of the RE Tariff Regulations, 2017. 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 above in this para (B) 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   | 3% for first 12 years and 13% for the remaining 28 years. |
| (ii)    | Above 2 MW to 5 MW capacity     | 7% for first 12 years and 13% for the remaining 28 years. |
| (iii)   | Above 5 MW to 25 MW capacity    | 13% for 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 7.15(d). 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, 2017 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. However, for any variations in the structure of free energy after approval/execution of PPA, the adjustment shall be computed in accordance with other relevant provision of the RE Tariff Regulations, 2017.

**(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 amendments if any, thereof as well as the orders as may be issued by the Commission from time to time.

**9.** The detailed computations for generic levelled 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.

Sd/-

(Bhanu Pratap Singh)  
**Member**

Sd/-

(S.K.B.S. Negi)  
**Chairman**

Place: Shimla.

**Annexure-A**

**List of stakeholders/participants attended the Public Hearing held on 20.01.2018.**

| <b>Sr. No.</b> | <b>Name</b>                                 |
|----------------|---|
| 1              | Er. Suneel Grover (Chief Engineer), HPSEBL. |
| 2              | Er. Sanjay Kumar, HPSEBL.                   |
| 3              | Sh. Rohit Rana, HPSEBL.                     |
| 4              | Er. Ramesh Kumar Sharma, HPSEBL             |
| 5              | Sh. Surya Kant, DoE.                        |
| 6              | Er. Virender Kumar, DoE.                    |
| 7              | Sh. Charnjeet Singh (Consultant)            |
| 8              | Sh. Arun Kumar, Leond HEP.                  |
| 9              | Sh. Ajay Vaidya, Advocate                   |
| 10             | Sh. V.S.V.A. Rao, DLI HEP.                  |
| 11             | Sanjeev Behl                                |



| Tariff for SHP of Capacity above 100kW upto 2MW(at 2MW) |                           | Appendix A Sheet- I |
|---|---------------------------|---------------------|
| <b>Assumptions for Small Hydro Power</b>                |                           |                     |
| <b>Generating Capacity (MW)</b>                         | <b>MW</b>                 | <b>1</b>            |
| <b>Project Cost</b>                                     |                           |                     |
| Cost/MW   | Rs Lacs/MW                | 880.00              |
| Project Cost  | Rs Lacs                   | 880.00              |
| MNES Subsidy  | Rs Lacs (at 1MW Capacity) | 112.5               |
| Term  | Years                     | 40                  |
| Return on Equity  | %                         | 17%                 |
| <b>Project Financing</b>                                |                           |                     |
| Project Debt  | % of project cost         | 70%                 |
| Project Debt  | Rs Lacs                   | 616.00              |
| Equity  | Rs Lacs                   | 264.00              |
| Term of Debt  | Years                     | 13                  |
| Moratorium  | Years                     | 0                   |
| Interest Rate   | %                         | 10.00%              |
| <b>Depreciation</b>                                     |                           |                     |
| Recovery of Depreciation                                | %                         | 90%                 |
| Rate of Depreciation (First 11 Years)                   | %                         | 5.28%               |
| Rate of Depreciation (Lats 29years)                     | %                         | 1.10%               |
| <b>Operating Norms</b>                                  |                           |                     |
| CUF   | %                         | 55%                 |
| Availability  | %                         | 100%                |
| Auxiliary Consumption                                   | %                         | 0.50%               |
| Transformation Losses                                   | %                         | 0.50%               |
| Transmission losses                                     |                           | 0.70%               |
| <b>O&amp;M Expenses</b>                                 | Rs. In Lacs/ MW           | 33.00               |
| <b>O&amp;M Expenses w.r.t Capital Cost</b>              | %                         |                     |
| Annual Escalation Factor                                | %                         | 5.72%               |
| <b>Tax</b>  |                           |                     |
| Tax Rate  | %                         | 34.61%              |
| MAT Rate  | %                         | 20.26%              |
| Surcharge   |                           | 12.00%              |
| Cess Rate   |                           | 3.00%               |
| Effectave ROE   |                           | 17.00%              |
| <b>Working Capital Norms</b>                            |                           |                     |
| Recievables   | Months                    | 2                   |
| Spares  | % of O&M Cost             | 15%                 |
| O&M Expenses  | Months                    | 1                   |
| Interest on Working Capital                             | %                         | 11.00%              |
| <b>Discount Factor</b>                                  | %                         | 8.64%               |
| <b>Depreciation amount</b>                              |                           | 90.00%              |
| <b>Book Depreciation rate</b>                           |                           | 5.28%               |
| <b>Income Tax (MAT)</b>                                 |                           | 20.26%              |
| <b>Income Tax (Normal Rates)</b>                        |                           | 34.610%             |

**GENERIC LEVELLISED TARIFF OF CATEGORY -I ( Above 100 KW to 2 MW )**

| DETERMINATION OF TARIFF COMPONENT       | UNIT     | YEAR→        | Y 01         | Y 02   | Y 03   | Y 04   | Y 05   | Y 06   | Y 07   | Y 08   | Y 09   | Y 10   | Y 11   | Y 12   | Y 13   | Y 14   | Y 15   | Y 16   | Y 17   | Y 18   |
|---|----------|--------------|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Gross Generation (MU)                   | (MU)     |              | 4.82         | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   |
| Auxiliary Consumption @ 1 % (.5% +.5%)  | (MU)     |              | 0.05         | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   |
| Net Generation (MU)                     | (MU)     |              | 4.77         | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   |
| Project Line Losses @ 0.7% (MU)         | (MU)     |              | 0.03         | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   |
| Saleable Energy (MU)                    | (MU)     |              | 4.74         | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   |
| Free Power                              | %        |              | 3%           | 3%     | 3%     | 3%     | 3%     | 3%     | 3%     | 3%     | 3%     | 3%     | 3%     | 3%     | 13%    | 13%    | 13%    | 13%    | 13%    | 13%    |
| Net Saleable Energy (Levelling/ Annual) | (MU)     | 4.433        | 4.60         | 4.60   | 4.60   | 4.60   | 4.60   | 4.60   | 4.60   | 4.60   | 4.60   | 4.60   | 4.60   | 4.60   | 4.12   | 4.12   | 4.12   | 4.12   | 4.12   | 4.12   |
| Cost Structure                          |          |              |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| <b>Fixed Cost</b>                       |          |              |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| RoE                                     | Rs Lacs. |              | 44.88        | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  |
| Depreciation                            | Rs Lacs. |              | 46.46        | 46.46  | 46.46  | 46.46  | 46.46  | 46.46  | 46.46  | 46.46  | 46.46  | 46.46  | 46.46  | 46.46  | 9.69   | 9.69   | 9.69   | 9.69   | 9.69   | 9.69   |
| O&M                                     | Rs Lacs. |              | 33.00        | 34.89  | 36.88  | 38.99  | 41.22  | 43.58  | 46.07  | 48.71  | 51.50  | 54.44  | 57.56  | 60.85  | 64.33  | 68.01  | 71.90  | 76.01  | 80.36  | 84.95  |
| WC Interest                             | Rs Lacs. |              | 4.12         | 4.02   | 4.02   | 4.03   | 4.04   | 4.06   | 4.08   | 4.11   | 4.15   | 4.19   | 4.26   | 3.71   | 3.86   | 4.02   | 4.20   | 4.38   | 4.57   | 4.78   |
| Interest on long Term loans             | Rs Lacs. |              | 53.61        | 43.24  | 38.50  | 33.77  | 29.03  | 24.29  | 19.55  | 14.81  | 10.07  | 5.33   | 1.48   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   |
| Advance Against Dep.                    | Rs Lacs. |              | 0.00         | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   |
| <b>Total</b>                            | Rs Lacs. |              | 182.07       | 173.49 | 170.75 | 168.13 | 165.63 | 163.27 | 161.05 | 158.98 | 157.06 | 155.31 | 154.64 | 119.12 | 122.76 | 126.60 | 130.66 | 134.96 | 139.50 | 144.30 |
| <b>Fixed Cost Rs Crores)</b>            |          |              |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| RoE                                     | Rs./ kWh |              | <b>1.015</b> | 0.98   | 0.90   | 0.83   | 0.76   | 0.70   | 0.65   | 0.59   | 0.55   | 0.50   | 0.46   | 0.43   | 0.39   | 0.40   | 0.37   | 0.34   | 0.31   | 0.29   |
| Depreciation                            | Rs./ kWh |              | <b>0.716</b> | 1.01   | 0.93   | 0.86   | 0.79   | 0.73   | 0.67   | 0.61   | 0.57   | 0.52   | 0.48   | 0.44   | 0.08   | 0.09   | 0.08   | 0.07   | 0.07   | 0.06   |
| O&M                                     | Rs./ kWh |              | <b>1.560</b> | 0.72   | 0.70   | 0.68   | 0.66   | 0.64   | 0.63   | 0.61   | 0.59   | 0.58   | 0.56   | 0.55   | 0.53   | 0.58   | 0.56   | 0.55   | 0.53   | 0.52   |
| WC Interest                             | Rs./ kWh |              | <b>0.108</b> | 0.09   | 0.08   | 0.07   | 0.07   | 0.06   | 0.06   | 0.05   | 0.05   | 0.05   | 0.04   | 0.04   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   |
| Interest on long Term loans             | Rs./ kWh |              | <b>0.391</b> | 1.17   | 0.87   | 0.71   | 0.57   | 0.45   | 0.35   | 0.26   | 0.18   | 0.11   | 0.06   | 0.01   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   |
| <b>Total Cost of Generation</b>         | Rs./ kWh |              | <b>3.790</b> | 3.96   | 3.47   | 3.15   | 2.85   | 2.59   | 2.35   | 2.13   | 1.94   | 1.76   | 1.60   | 1.47   | 1.04   | 1.10   | 1.05   | 0.99   | 0.94   | 0.90   |
| Disc factor                             |          | <b>8.64%</b> | 1.00         | 0.92   | 0.85   | 0.78   | 0.72   | 0.66   | 0.61   | 0.56   | 0.52   | 0.47   | 0.44   | 0.40   | 0.37   | 0.34   | 0.31   | 0.29   | 0.27   | 0.24   |
| Discounted Rate                         | Rs./ kWh |              | 3.96         | 3.47   | 3.15   | 2.85   | 2.59   | 2.35   | 2.13   | 1.94   | 1.76   | 1.60   | 1.47   | 1.04   | 1.10   | 1.05   | 0.99   | 0.94   | 0.90   | 0.86   |
| <b>Generic Levellised Tariff</b>        | Rs./ kWh |              | <b>3.790</b> |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |

**Generic Levellised Tariff = Rs. 3.79 /kWh**



## **Appendix-A Sheet-IV**

### **Generic Levelled Tariffs and Associated terms and Conditions for category-I of SHPs (i.e. above 100 kW to 2 MW) as per HPERC (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2017:**

The generic levelled tariff for the SHP's under this category (i.e. above 100 kW to 2 MW Capacity) shall be Rs. 3.79/kWh.

The above generic levelled tariff shall be subject to adjustments in accordance with the following subparagraphs (a) to (c):-

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

| Description                                    | Increase in Paise/kWh on account of different rate of capital subsidy |
|--|---|
| If the capacity is more than 100 kW to 2000 kW | No increase   |

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 22 of the RE Tariff Regulations, 2017. Similarly, the adjustments on account of additional MNRE subsidy to Government Sector Projects shall also be made separately on case to case basis. The above formulae shall not be applicable in any of such cases.

#### **(b) Variation in free power structure:**

The tariffs as mentioned above account for free power (energy) @ 3% for the first 12 years and @13% for the balance tariff period of 28 years. The levelled net saleable energy for this structure of free power has been worked out as 4.433 MUs per annum per MW.

In case the structure of free power(energy) applicable for SHP for which the PPA is to be approved by the Commission is different from that considered in the tariff computation, the adjustment shall be carried out in accordance with the para 25 of this proposal. 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 sub-regulation (2) and (3) of regulation 36 of the RE Tariff Regulations, 2017 during any part of the tariff period. The adjustment on this account, if required, shall be carried out after carrying out the adjustment(s), if any, as per above.

#### **(c) Rounding:**

The tariff worked out after carrying out the adjustments on the above lines shall be rounded to the nearest Paise. 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.

The tariff shall be subject to the RE Tariff Regulations, 2017 and the order(s) as may be issued by the Commission thereunder.

**ILLUSTRATIONS**

**Basic Data of the SHP for which Generic levelled tariff is to be computed**

|   |                         |   |
|---|-------------------------|---|
| 1 | Capacity of the Project | 1.9 MW (1900 kW)                                      |
| 2 | Free Power Structure    | 1% for first 12 years and 13% for remaining 28 years. |

**Calculations:**

|   |   |  |
|---|---|--|
| 3 | Category under which the SHP falls  | I (Above 100kW to 2 MW)                            |
| 4 | Generic levelled tariff   | Rs.3.79/kWh  |
| 5 | Adjustment of capital subsidy as per Sheet-IV   |  |
|   | for the capacity of 1900 kW   | No increase  |
| 6 | Tariff after adjustment under as per Sheet-IV   | Rs.3.79 per kWh                                    |
| 7 | Adjustment under as per Sheet-IV  |  |
|   | Levelled net saleable energy per annum per MW as per the generic tariff as per Sheet-II   | 4.433 MU   |
|   | Levelled net saleable energy per annum per MW as per the permissible free power structure applicable to the project for which tariff is to be calculated (with discount factor 8.64% per annum) | 4.495 MU   |
| 8 | Tariff adjustment as per sheet- IV  | $Rs. 3.79 \times 4.433 / 4.495$<br>=Rs. 3.737 /kWh |
| 9 | Tariff applicable after rounding item 8.  | Rs. 3.74/kWh<br>of net saleable energy             |

| Tariff for SHPs 2MW to 5MW capacity (at 2MW) |                              | Appendix B Sheet- I |
|--|------------------------------|---------------------|
| <b>Assumptions for Small Hydro Power</b>     |                              |                     |
| <b>Generating Capacity (MW)</b>              | <b>MW</b>                    | <b>1</b>            |
| <b>Project Cost</b>                          |                              |                     |
| Cost/MW                                      | Rs Lacs/MW                   | <b>850.00</b>       |
| Project Cost                                 | Rs Lacs                      | 850.00              |
| MNES Subsidy                                 | Rs Lacs/MW( at 2MW capacity) | 112.5               |
| Term   | Years                        | 40                  |
| Return on Equity                             | %                            | 17%                 |
| <b>Project Financing</b>                     |                              |                     |
| Project Debt                                 | % of project cost            | <b>70%</b>          |
| Project Debt                                 | Rs Lacs                      | 595.00              |
| Equity                                       | Rs Lacs                      | 255.00              |
| Term of Debt                                 | Years                        | <b>13</b>           |
| Moratorium                                   | Years                        | <b>0</b>            |
| Interest Rate                                | %                            | <b>10.00%</b>       |
| <b>Depreciation</b>                          |                              |                     |
| Recovery of Depreciation                     | %                            | 90%                 |
| Rate of Depreciation (First 11 Years)        | %                            | 5.28%               |
| Rate of Depreciation (Last 29 years)         | %                            | 1.10%               |
| <b>Operating Norms</b>                       |                              |                     |
| CUF  | %                            | <b>55%</b>          |
| Availability                                 | %                            | <b>100%</b>         |
| Auxiliary Consumption                        | %                            | <b>0.50%</b>        |
| Transformation Losses                        | %                            | <b>0.50%</b>        |
| Transmission losses                          | %                            | <b>0.70%</b>        |
| <b>O&amp;M Expenses</b>                      | Rs. In Lacs./ MW             | <b>29.00</b>        |
| <b>O&amp;M Expenses w.r.t Capital Cost</b>   | %                            |                     |
| Annual Escalation Factor                     | %                            | <b>5.72%</b>        |
| <b>Tax</b>                                   |                              |                     |
| Tax Rate                                     | %                            | 34.610%             |
| MAT Rate                                     | %                            | 20.26%              |
| Surcharge                                    |                              | 12.00%              |
| Cess Rate                                    |                              | 3.00%               |
| Effective ROE                                |                              | 17.00%              |
| <b>Working Capital Norms</b>                 |                              |                     |
| Receivables                                  | Months                       | <b>2</b>            |
| Spares                                       | % of O&M Cost                | <b>15%</b>          |
| O&M Expenses                                 | Months                       | <b>1</b>            |
| Interest on Working Capital                  | %                            | <b>11.000%</b>      |
| <b>Discount Factor</b>                       | %                            | <b>8.64%</b>        |
| <b>Depreciation amount</b>                   |                              | <b>90.00%</b>       |
| <b>Book Depreciation rate</b>                |                              | <b>5.28%</b>        |
| <b>Income Tax (MAT)</b>                      |                              | <b>20.26%</b>       |
| <b>Income Tax (Normal Rates)</b>             |                              | <b>34.610%</b>      |

**GENERIC LEVELLISED TARIFF OF CATEGORY -II ( Above 2MW to 5 MW)**

| DETERMINATION OF TARIFF COMPONENT        | UNIT     | YEAR→        | Y 01         | Y 02   | Y 03   | Y 04   | Y 05   | Y 06   | Y 07   | Y 08   | Y 09   | Y 10   | Y 11   | Y 12   | Y 13   | Y 14   | Y 15   | Y 16   | Y 17   | Y 18   |      |
|--|----------|--------------|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| Gross Generation (MU)                    | (MU)     |              | 4.82         | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   | 4.82   |      |
| Auxiliary Consumption @ 1 % (.5% +.5%)   | (MU)     |              | 0.05         | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   | 0.05   |      |
| Net Generation (MU)                      | (MU)     |              | 4.77         | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   | 4.77   |      |
| Project Line Losses @ 0.7% (MU)          | (MU)     |              | 0.03         | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   |      |
| Saleable Energy (MU)                     | (MU)     |              | 4.74         | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   |      |
| Free Power                               | %        |              | 7%           | 7%     | 7%     | 7%     | 7%     | 7%     | 7%     | 7%     | 7%     | 7%     | 7%     | 7%     | 13%    | 13%    | 13%    | 13%    | 13%    | 13%    |      |
| Net Saleable Energy (Levellised/ Annual) | (MU)     | 4.309        | 4.41         | 4.41   | 4.41   | 4.41   | 4.41   | 4.41   | 4.41   | 4.41   | 4.41   | 4.41   | 4.41   | 4.41   | 4.12   | 4.12   | 4.12   | 4.12   | 4.12   | 4.12   |      |
| Cost Structure                           |          |              |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |      |
| <b>Fixed Cost</b>                        |          |              |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |      |
| RoE                                      | Rs Lacs. |              | 43.35        | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  | 43.35  |      |
| Depreciation                             | Rs Lacs. |              | 44.88        | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 44.88  | 9.36   | 9.36   | 9.36   | 9.36   | 9.36   | 9.36   | 9.36   |      |
| O&M                                      | Rs Lacs. |              | 29.00        | 30.66  | 32.41  | 34.27  | 36.23  | 38.30  | 40.49  | 42.81  | 45.25  | 47.84  | 50.58  | 53.47  | 56.53  | 59.76  | 63.18  | 66.80  | 70.62  | 74.66  |      |
| WC Interest                              | Rs Lacs. |              | 3.85         | 3.74   | 3.73   | 3.73   | 3.74   | 3.74   | 3.76   | 3.78   | 3.80   | 3.83   | 3.89   | 3.34   | 3.48   | 3.62   | 3.78   | 3.94   | 4.11   | 4.29   |      |
| Interest on long Term loans              | Rs Lacs. |              | 51.59        | 41.38  | 36.81  | 32.23  | 27.65  | 23.08  | 18.50  | 13.92  | 9.35   | 4.77   | 1.24   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   |      |
| Advance Against Dep.                     | Rs Lacs. |              | 0.00         | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   |      |
| <b>Total</b>                             | Rs Lacs. |              | 172.67       | 164.01 | 161.18 | 158.46 | 155.85 | 153.35 | 150.98 | 148.73 | 146.63 | 144.67 | 143.94 | 109.52 | 112.72 | 116.09 | 119.66 | 123.44 | 127.43 | 131.65 |      |
| <b>Fixed Cost Rs Crores)</b>             |          |              |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |      |
| RoE                                      | Rs./ kWh |              | <b>1.007</b> | 0.98   | 0.91   | 0.83   | 0.77   | 0.71   | 0.65   | 0.60   | 0.55   | 0.51   | 0.47   | 0.43   | 0.40   | 0.39   | 0.36   | 0.33   | 0.30   | 0.28   | 0.26 |
| Depreciation                             | Rs./ kWh |              | <b>0.718</b> | 1.02   | 0.94   | 0.86   | 0.79   | 0.73   | 0.67   | 0.62   | 0.57   | 0.52   | 0.48   | 0.44   | 0.09   | 0.08   | 0.08   | 0.07   | 0.07   | 0.06   | 0.06 |
| O&M                                      | Rs./ kWh |              | <b>1.394</b> | 0.66   | 0.64   | 0.62   | 0.61   | 0.59   | 0.57   | 0.56   | 0.54   | 0.53   | 0.51   | 0.50   | 0.49   | 0.51   | 0.49   | 0.48   | 0.47   | 0.45   | 0.44 |
| WC Interest                              | Rs./ kWh |              | <b>0.101</b> | 0.09   | 0.08   | 0.07   | 0.07   | 0.06   | 0.06   | 0.05   | 0.05   | 0.04   | 0.04   | 0.04   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03   | 0.03 |
| Interest on long Term loans              | Rs./ kWh |              | <b>0.389</b> | 1.17   | 0.86   | 0.71   | 0.57   | 0.45   | 0.35   | 0.26   | 0.18   | 0.11   | 0.05   | 0.01   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00 |
| Advance Against Dep.                     | Rs./ kWh |              | <b>0.000</b> | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00 |
| <b>Total Cost of Generation</b>          | Rs./ kWh |              | <b>3.609</b> | 3.92   | 3.42   | 3.10   | 2.80   | 2.54   | 2.30   | 2.08   | 1.89   | 1.71   | 1.56   | 1.43   | 1.00   | 1.01   | 0.96   | 0.91   | 0.86   | 0.82   | 0.78 |
| Disc factor                              |          | <b>8.64%</b> |              | 1.00   | 0.92   | 0.85   | 0.78   | 0.72   | 0.66   | 0.61   | 0.56   | 0.52   | 0.47   | 0.44   | 0.40   | 0.37   | 0.34   | 0.31   | 0.29   | 0.27   | 0.24 |
| Discounted Rate                          | Rs./ kWh |              | 3.609        | 3.92   | 3.42   | 3.10   | 2.80   | 2.54   | 2.30   | 2.08   | 1.89   | 1.71   | 1.56   | 1.43   | 1.00   | 1.01   | 0.96   | 0.91   | 0.86   | 0.82   | 0.78 |
| <b>Generic Levellised Tariff</b>         | Rs./ kWh | <b>3.609</b> |              |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |      |

**Generic Levellised Tariff = Rs. 3.61 /kWh**





**Generic Levellised Tariffs and Associated terms and Conditions for category-II of SHPs (i.e. above 2 MW to 5 MW) as per HPERC (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2017:**

The generic levellised tariff for the SHP's under this category (i.e. above 2 MW to 5 MW Capacity) shall be Rs. 3.61/kWh

The above generic levellised tariff shall be subject to adjustments in accordance with the following subparagraphs (a) to (c):-

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

| Description  | Increase in Paise/kWh on account of different rate of capital subsidy |
|--|---|
| If the capacity is more than 2000 kW but does not exceed 5000 kW | =7/37.50* (112.5-"Y") Paise/kWh                                       |

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 22 of the RE Tariff Regulations, 2017. Similarly, the adjustments on account of additional MNRE subsidy to Government Sector Projects shall also be made separately on case to case basis. The above formulae shall not be applicable in any of such cases.

**(b) Variation in free power structure:**

The tariffs as mentioned above account for free power (energy) @ 7 % for the first 12 years and @13% for the balance tariff period of 28 years. The levellised net saleable energy for this structure of free power has been worked out as 4.309 MUs per annum per MW.

In case the structure of free power(energy) applicable for SHP for which the PPA is to be approved by the Commission is different from that considered in the tariff computation, the adjustment shall be carried out in accordance with the para 25 of this proposal. 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 sub-regulation (2) and (3) of Regulation 36 of the RE Tariff Regulations, 2017 during any part of the tariff period. The adjustment on this account, if required, shall be carried out after carrying out the adjustment(s), if any, as per 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.

The tariff shall be subject to the RE Tariff Regulations, 2017 and the order(s) as may be issued by the Commission thereunder.

**Appendix-B Sheet-V**

**ILLUSTRATIONS**

**Basic Data of the SHP for which Generic levelled tariff is to be computed**

|   |                         |   |
|---|-------------------------|---|
| 1 | Capacity of the Project | 4500 kW (4.5 MW)                                      |
| 2 | Free Power Structure    | 1% for first 12 years and 13% for remaining 28 years. |

**Calculations:**

|    |   |   |
|----|---|---|
| 3  | Category under which the SHP falls  | II (Above 2 MW to 5 MW)   |
| 4  | Generic levelled tariff   | Rs.3.61/kWh   |
| 5  | Adjustment under as per Sheet-IV  |   |
|    | (i) for the capacity of 4500 kW   | =7/37.50* (112.5-“Y”)<br>Paise/kWh                              |
|    | Where ‘Y’=75% capital subsidy/MW (in lac Rs.)as per Column 4 of Appendix-D i.e. for 4.5 MW (4500 kW) =83.33 lakhs   |   |
|    | (ii)  | =7/37.50* (112.5- 83.33)<br>=5.45 Paise/kWh<br>= Rs. 0.055/ kWh |
| 6  | Tariff after adjustment as per Sheet-IV (4+5)   | Rs. 3.67 per kWh  |
| 7  | Adjustment under as per Sheet-IV  |   |
|    | Levelled net saleable energy per annum per MW as per the generic tariff as per sheet-II   | 4.309 MUs   |
|    | Levelled net saleable energy per annum per MW as per the permissible free power structure applicable to the project for which tariff is to be calculated (with discount factor 8.64% per annum) | 4.495 MU  |
| 8  | Tariff after adjustment as per Sheet- IV  | Rs. 3.67*4.309/4.495<br>= Rs. 3.518/kWh                         |
| 9. | Tariff applicable after rounding item 8.  | Rs. 3.52/kWh<br>of net saleable energy                          |

| Tariff for SHPs Above 5MW to 25MW (at 5MW) |                   | Appendix C Sheet- I |
|--|-------------------|---------------------|
| <b>Assumptions for Small Hydro Power</b>   |                   |                     |
| <b>Generating Capacity (MW)</b>            | <b>MW</b>         | <b>1</b>            |
| <b>Project Cost</b>                        |                   |                     |
| Cost/MW                                    | Rs Lacs/MW        | 800.00              |
| Project Cost                               | Rs Lacs/MW        | 800.00              |
| MNES Subsidy (at 5MW Capacity)             | Rs Lacs/MW        | 75                  |
| Term                                       | Years             | 40                  |
| Return on Equity                           | %                 | 17%                 |
| <b>Project Financing</b>                   |                   |                     |
| Project Debt                               | % of project cost | 70%                 |
| Project Debt                               | Rs Lacs           | 560.00              |
| Equity                                     | Rs Lacs           | 240.00              |
| Term of Debt                               | Years             | 13                  |
| Interest Rate                              | %                 | 10.000%             |
| <b>Depreciation</b>                        |                   |                     |
| Recovery of Depreciation                   | %                 | 90%                 |
| Rate of Depreciation (First 12 Years)      | %                 | 5.28%               |
| Rate of Depreciation (Lats 28 years)       | %                 | 0.95%               |
| <b>Operating Norms</b>                     |                   |                     |
| CUF  | %                 | 55%                 |
| Availability                               | %                 | 100%                |
| Auxiliary Consumption                      | %                 | 0.50%               |
| Transformation Losses                      | %                 | 0.50%               |
| Transmission losses                        | %                 | 0.70%               |
| <b>O&amp;M Expenses</b>                    | Rs. Lacs/ MW      | 24.00               |
| <b>O&amp;M Expenses w.r.t Capital Cost</b> | %                 |                     |
| Annual Escalation Factor                   | %                 | 5.72%               |
| <b>Tax</b>                                 |                   |                     |
| Tax Rate                                   | %                 | 34.61%              |
| MAT Rate                                   | %                 | 20.26%              |
| Surcharge                                  |                   | 12.00%              |
| Cess Rate                                  |                   | 3.00%               |
| Effective ROE                              |                   | 17.00%              |
| <b>Working Capital Norms</b>               |                   |                     |
| Receivables                                | Months            | 2                   |
| Spares                                     | % of O&M Cost     | 15%                 |
| Escalation Factor for Spares               | %                 | 0%                  |
| O&M Expenses                               | Months            | 1                   |
| Interest on Working Capital                | %                 | 11.000%             |
| <b>Discount Factor</b>                     | %                 | 8.64%               |
| <b>Depreciation amount</b>                 |                   | 90.00%              |
| <b>Book Depreciation rate</b>              |                   | 5.28%               |
| <b>Income Tax (MAT)</b>                    |                   | 20.26%              |
| <b>Income Tax (Normal Rates)</b>           |                   | 34.610%             |

**GENERIC LEVELLISED TARIFF OF CATEGORY -III (Above 5 MW to 25 MW)**

| <b>DETERMINATION OF TARIFF COMPONENT</b> | <b>UNIT</b> | <b>YEAR→</b> | <b>Y 01</b>  | <b>Y 02</b> | <b>Y 03</b>  | <b>Y 04</b> | <b>Y 05</b> | <b>Y 06</b> | <b>Y 07</b> | <b>Y 08</b> | <b>Y 09</b> | <b>Y 10</b> | <b>Y 11</b> | <b>Y 12</b> | <b>Y 13</b> | <b>Y 14</b> | <b>Y 15</b> | <b>Y 16</b> | <b>Y 17</b> | <b>Y 18</b> |
|--|-------------|--------------|--------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Gross Generation (MU)                    | (MU)        |              | 4.82         | 4.82        | 4.82         | 4.82        | 4.82        | 4.82        | 4.82        | 4.82        | 4.82        | 4.82        | 4.82        | 4.82        | 4.82        | 4.82        | 4.82        | 4.82        | 4.82        | 4.82        |
| Auxiliary Consumption @ 1 % (.5% +.5%)   | (MU)        |              | 0.05         | 0.05        | 0.05         | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        |
| Net Generation (MU)                      | (MU)        |              | 4.77         | 4.77        | 4.77         | 4.77        | 4.77        | 4.77        | 4.77        | 4.77        | 4.77        | 4.77        | 4.77        | 4.77        | 4.77        | 4.77        | 4.77        | 4.77        | 4.77        | 4.77        |
| Project Line Losses @ 0.7% (MU)          | (MU)        |              | 0.03         | 0.03        | 0.03         | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        |
| Saleable Energy (MU)                     | (MU)        |              | 4.74         | 4.74        | 4.74         | 4.74        | 4.74        | 4.74        | 4.74        | 4.74        | 4.74        | 4.74        | 4.74        | 4.74        | 4.74        | 4.74        | 4.74        | 4.74        | 4.74        | 4.74        |
| Free Power                               | %           |              | 13%          | 13%         | 13%          | 13%         | 13%         | 13%         | 13%         | 13%         | 13%         | 13%         | 13%         | 13%         | 13%         | 13%         | 13%         | 13%         | 13%         | 13%         |
| Net Saleable Energy (Levellised/ Annual) | (MU)        | 4.124        | 4.12         | 4.12        | 4.12         | 4.12        | 4.12        | 4.12        | 4.12        | 4.12        | 4.12        | 4.12        | 4.12        | 4.12        | 4.12        | 4.12        | 4.12        | 4.12        | 4.12        | 4.12        |
| Cost Structure                           |             |              |              |             |              |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| <b>Fixed Cost</b>                        |             |              |              |             |              |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| RoE                                      | Rs Lacs.    |              | 40.80        | 40.80       | 40.80        | 40.80       | 40.80       | 40.80       | 40.80       | 40.80       | 40.80       | 40.80       | 40.80       | 40.80       | 40.80       | 40.80       | 40.80       | 40.80       | 40.80       | 40.80       |
| Depreciation                             | Rs Lacs.    |              | 42.24        | 42.24       | 42.24        | 42.24       | 42.24       | 42.24       | 42.24       | 42.24       | 42.24       | 42.24       | 42.24       | 42.24       | 7.61        | 7.61        | 7.61        | 7.61        | 7.61        | 7.61        |
| O&M                                      | Rs Lacs.    |              | 24.00        | 25.37       | 26.82        | 28.36       | 29.98       | 31.70       | 33.51       | 35.43       | 37.45       | 39.59       | 41.86       | 44.25       | 46.78       | 49.46       | 52.29       | 55.28       | 58.44       | 61.78       |
| WC Interest                              | Rs Lacs.    |              | 3.51         | 3.42        | 3.41         | 3.40        | 3.39        | 3.39        | 3.39        | 3.39        | 3.41        | 3.42        | 3.44        | 3.50        | 2.97        | 3.09        | 3.21        | 3.35        | 3.49        | 3.64        |
| Interest on long Term loans              | Rs Lacs.    |              | 50.10        | 42.04       | 37.73        | 33.42       | 29.12       | 24.81       | 20.50       | 16.19       | 11.88       | 7.58        | 3.27        | 0.56        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        |
| Advance Against Dep.                     | Rs Lacs.    |              | 0.00         | 0.00        | 0.00         | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        |
| Total                                    | Rs Lacs.    |              | 160.64       | 153.87      | 151.00       | 148.22      | 145.53      | 142.93      | 140.44      | 138.05      | 135.78      | 133.63      | 131.61      | 131.35      | 98.16       | 100.96      | 103.91      | 107.04      | 110.34      | 113.83      |
| <b>Fixed Cost Rs Crores)</b>             |             |              |              |             |              |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| RoE                                      | Rs./ kWh    |              | <b>0.989</b> | 0.99        | 0.91         | 0.84        | 0.77        | 0.71        | 0.65        | 0.60        | 0.55        | 0.51        | 0.47        | 0.43        | 0.40        | 0.37        | 0.34        | 0.31        | 0.29        | 0.26        |
| Depreciation                             | Rs./ kWh    |              | <b>0.734</b> | 1.02        | 0.94         | 0.87        | 0.80        | 0.74        | 0.68        | 0.62        | 0.57        | 0.53        | 0.49        | 0.45        | 0.41        | 0.07        | 0.06        | 0.06        | 0.05        | 0.05        |
| O&M                                      | Rs./ kWh    |              | <b>1.186</b> | 0.58        | 0.57         | 0.55        | 0.54        | 0.52        | 0.51        | 0.49        | 0.48        | 0.47        | 0.46        | 0.44        | 0.43        | 0.42        | 0.41        | 0.40        | 0.39        | 0.38        |
| WC Interest                              | Rs./ kWh    |              | <b>0.092</b> | 0.09        | 0.08         | 0.07        | 0.06        | 0.06        | 0.05        | 0.05        | 0.05        | 0.04        | 0.04        | 0.04        | 0.03        | 0.03        | 0.03        | 0.02        | 0.02        | 0.02        |
| Interest on long Term loans              | Rs./ kWh    |              | <b>0.434</b> | 1.21        | 0.94         | 0.78        | 0.63        | 0.51        | 0.40        | 0.30        | 0.22        | 0.15        | 0.09        | 0.03        | 0.01        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        |
| <b>Total Cost of Generation</b>          | Rs./ kWh    |              | <b>3.436</b> | 3.90        | 3.43         | 3.10        | 2.80        | 2.53        | 2.29        | 2.07        | 1.87        | 1.70        | 1.54        | 1.39        | 1.28        | 0.88        | 0.83        | 0.79        | 0.75        | 0.71        |
| Disc factor                              |             | <b>8.64%</b> | 1.00         | 0.92        | 0.85         | 0.78        | 0.72        | 0.66        | 0.61        | 0.56        | 0.52        | 0.47        | 0.44        | 0.40        | 0.37        | 0.34        | 0.31        | 0.29        | 0.27        | 0.24        |
| Discounted Rate                          | Rs./ kWh    |              | 3.90         | 3.43        | 3.10         | 2.80        | 2.53        | 2.29        | 2.07        | 1.87        | 1.70        | 1.54        | 1.39        | 1.28        | 0.88        | 0.83        | 0.79        | 0.75        | 0.71        | 0.67        |
| <b>Generic Levellised Tariff</b>         | Rs./ kWh    |              |              |             | <b>3.436</b> |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |

**Generic Levellised Tariff = Rs. 3.44 /kWh**



## Appendix-C Sheet IV

### **Generic Levellised Tariffs and Associated terms and Conditions for category-III of SHPs (i.e. above 5 MW to 25 MW) as per HPERC (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2017:-**

The generic levellised tariff for the SHP's under this category (i.e. above 5 MW to 25 MW Capacity) shall be Rs. 3.44/kWh.

The above generic levellised tariff shall be subject to adjustments in accordance with the following subparagraphs (a) to (c):-

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

| Description   | Increase in Paise/kWh on account of different rate of capital subsidy |
|---|---|
| If the capacity is more than 5000 kW but does not exceed 25000 kW | =10/60 * (75-"Y") Paise/kWh   |

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 22 of the RE Tariff Regulations, 2017. Similarly, the adjustments on account of additional MNRE subsidy to Government Sector Projects shall also be made separately on case to case basis. The above formulae shall not be applicable in any of such cases.

#### **(b) Variation in free power structure:**

The tariffs as mentioned above account for free power (energy) @ 13% for the entire tariff period of 40 years. The levellised net saleable energy for this structure of free power has been worked out as 4.123 MUs per annum per MW.

In case the structure of free power(energy) applicable for SHP for which the PPA is to be approved by the Commission is different from that considered in the tariff computation, the adjustment shall be carried out in accordance with the para 25 of the main order. 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 sub-regulation (2) and (3) of regulation 36 of the RE Tariff Regulations, 2017 during any part of the tariff period. The adjustment on this account, if required, shall be carried out after carrying out the adjustment(s), if any, as per 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.

The tariff shall be subject to the RE Tariff Regulations, 2017 and the order(s) as may be issued by the Commission thereunder.

**ILLUSTRATIONS**

**Basic Data of the SHP for which Generic levelled tariff is to be computed**

|   |                         |                            |
|---|-------------------------|----------------------------|
| 1 | Capacity of the Project | 21.1 MW (21100 kW)         |
| 2 | Free Power Structure    | 13% for the entire period. |

**Conclusions:**

|   |  |  |
|---|--|--|
| 3 | Category under which the SHP falls   | III (Above 5 MW to 25MW)               |
| 4 | Generic levelled tariff  | Rs.3.44/kWh                            |
| 5 | Adjustment as per Sheet-IV   |  |
|   | (i) for the capacity of 21100 kW (21.1 MW)   | =10/60 * (75-“Y”) Paise/kWh            |
|   | Where ‘Y’=75% capital subsidy/MW (in lac Rs.)as per Column 4 of Appendix-D i.e. for 21.1 MW (21100kW) =17.77 lakhs |  |
|   | (ii)   | =10/60 * (75-17.77)<br>=9.54 Paise/kWh |
| 6 | Tariff after adjustment as per Sheet-IV (4+5)  | Rs. 3.54 per kWh                       |
| 7 | Adjustment on account of free power  | Not applicable in this case            |
| 8 | Tariff after adjustment as per Sheet-IV  | Rs. 3.54/kWh                           |

## **Appendix-D**

Per MW Amount of capital subsidy for SHPs based as per the MNRE scheme dated 2nd July, 2014

| Rs in Lacs     |                      |                      |                           |
|----------------|----------------------|----------------------|---------------------------|
| Capacity in MW | MNRE Capital Subsidy | Capital Subsidy/MW   | 75% of Capital subsidy/MW |
| Col-1          | Col-2                | Col-3= (Col-2/Col-1) | Col-4=(0.75*Col-3)        |
| 1              | 150                  | 150                  | 112.50                    |
| 2              | 300                  | 150                  | 112.50                    |
| 3              | 450                  | 150                  | 112.50                    |
| 4              | 500                  | 125                  | 93.75                     |
| 5              | 500                  | 100                  | 75.00                     |
| 6              | 500                  | 83.33                | 62.50                     |
| 7              | 500                  | 71.43                | 53.57                     |
| 8              | 500                  | 62.50                | 46.88                     |
| 9              | 500                  | 55.56                | 41.67                     |
| 10             | 500                  | 50.00                | 37.50                     |
| 11             | 500                  | 45.45                | 34.09                     |
| 12             | 500                  | 41.67                | 31.25                     |
| 13             | 500                  | 38.46                | 28.85                     |
| 14             | 500                  | 35.71                | 26.79                     |
| 15             | 500                  | 33.33                | 25.00                     |
| 16             | 500                  | 31.25                | 23.44                     |
| 17             | 500                  | 29.41                | 22.06                     |
| 18             | 500                  | 27.78                | 20.83                     |
| 19             | 500                  | 26.32                | 19.74                     |
| 20             | 500                  | 25.00                | 18.75                     |
| 21             | 500                  | 23.81                | 17.86                     |
| 22             | 500                  | 22.73                | 17.05                     |
| 23             | 500                  | 21.74                | 16.30                     |
| 24             | 500                  | 20.83                | 15.63                     |
| 25             | 500                  | 20.00                | 15.00                     |

The values under col-4 shall be used (i.e. as value "Y" in lac Rs.) for working out the adjustment on account of the differential rate of capital subsidy for the projects above 2MW to 25MW capacity as per the formulae given in this order. In cases where the capacity of SHPs involves in fraction of MW, the value of 'Y' (in lac Rs.) in the said formulae shall be worked out on similar lines on which the values under Col-2,3 & 4 have been worked out.