

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
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CASE No.135 of 2015

In the matter of
Determination of Generic Tariff for Renewable Energy for the period from 10
November, 2015 to 31 March, 2016 of FY 2015-16

Coram

Shri. Azeez M. Khan, Member
Shri. Deepak Lad, Member

ORDER

Dated: 25 January, 2016

In exercise of the powers vested under Sections 61, 66 and 86 read with Section 181 of the Electricity Act (EA), 2003 and other powers enabling it in this behalf, the Maharashtra Electricity Regulatory Commission (MERC) has notified the MERC (Terms and Conditions for determination of Renewable Energy (RE) Tariff) Regulations, 2015, (“the RE Tariff Regulations”) on 10 November, 2015. The RE Tariff Regulations specify the Terms and Conditions and the Procedure for determination of Generic Tariff by the Commission in respect of the following Renewable Energy Generating Stations:

- (a) Wind Power Projects;
- (b) Biomass-based Power Project, Non-Fossil Fuel-based Co-Generation;
- (c) Mini/Micro and Small Hydro Power Projects;
- (d) Solar PV/Solar Thermal Power Projects;
- (e) Solar Roof-top PV Systems Power Projects

2. Regulation 9.1 of the RE Tariff Regulations requires the Commission to determine suo-moto the Generic Tariff for the RE technologies for which norms have been specified in the Regulations:

“9.1 The Commission shall notify the generic tariff at the beginning of each year of the Review Period considering the norms specified by the Central Commission from time to time with regard to the respective RE technologies:

Provided that, for the first year (FY 2015-16) of the Review Period, the generic tariff may be determined by the Commission within three months from the date of notification of these Regulations.”

3. As the Control Period of the MERC (RE Tariff) Regulations, 2010 was upto the end of FY 2014-15, i.e., upto 31 March, 2015, the Commission initiated the process of review of the Regulations for next Control Period, i.e., beyond FY 2014-15. Since the regulatory process of notification of RE Tariff Regulations, 2015 was not completed by 31 March, 2015 and no generic norms for FY 2015-16 were available for determination of Generic Tariff for FY 2015-16 at the beginning of that Financial Year, the Commission extended the period of applicability of its last Generic Tariff Order dated 7 July, 2014 in Case No. 100 of 2014, along with related terms and conditions, till 31 July, 2015 vide Order dated 22 April, 2015 in Case No. 34 of 2015. This was further extended upto 31 October, 2015 or the issue of the new RE Tariff Order, whichever is earlier, vide Order dated 21 July, 2015 in Case No. 92 of 2015. The Commission further extended the applicability of the existing Generic Tariff Order dated 7 July, 2014 in Case No. 100 of 2014, along with its related terms and conditions, till 31 December, 2015 or issue of the new RE Tariff Order, whichever is earlier, vide its Order dated 4 November 2015 in Case No 134 of 2015.

4. However, the Commission notified its RE Tariff Regulations, 2015 on 10 November, 2015. Accordingly, the Commission has determined through this Order the Generic Tariff for RE Technologies for the period from the date of publication of RE Tariff Regulations in the Official Gazette as per Regulation 1.2 of the RE Tariff Regulations (i.e., from 10 November, 2015) to 31 March, 2016. .

5. Through a Public Notice published in the daily newspapers Indian Express and DNA (English) and Lokmat and Loksatta (Marathi) on 2 December, 2015 the Commission invited comments by 23 December, 2014 on its draft RE Tariff Order which was made available on its websites, and intimated that a Public Hearing would also be held on that date. Accordingly, the Public Hearing was held on 23 December, 2015, at Centrum Hall, 1st floor, Centre No.1, World Trade Centre, Cuffe Parade, Mumbai. The list of persons who submitted their comments, suggestions and objections in writing and/or made oral submissions during the Public Hearing is at **Appendix-1** and the list of those who participated in the Public Hearing is at **Appendix-2**.

6. After considering the responses received on the Draft Order published by the Commission and in discharge of its mandate under Regulation 9.1 of the RE Tariff Regulations, 2015, the Commission hereby determines the Generic Tariff of RE Projects for the period from the date of publication of the Regulations in the Official Gazette, as per Regulation 1.2, till the close of FY 2015-16, i.e., from 10 November, 2015 to 31 March,

2016. The Generic Tariff determined through this Order is based on the financial principles and technology specific parameters as explained in the subsequent sections of the Order.

1. Suggestions and Objections received, and Commission's Rulings

1.1. Applicability of Tariff Order

Suggestions and Objections

Maha Co-Gen Green Power Producers Association sought that the Tariff be applicable for the entire period of FY 2015-16 in line with Regulation 9.1 of the RE Tariff Regulations, and that the Distribution Licensees should pay the difference between the Tariff now determined and the Tariff that was earlier applicable. The actual cost of generation from Co-Generation plants is substantially higher than the applicable Tariff. Thus, Co-Generation power producers will incur losses if the Tariff is applied for only the remaining 3 months of the year.

Yash Agro Energy Limited and ReGen Power Tech Private Limited have also sought that a uniform Tariff be provided for the entire period of FY 2015-16.

Cogeneration Association of India sought that the new Tariff be applicable at least from 1 October, 2015 onwards, so that the sugar industry gets the benefit at least for the cane crushing season commencing in October.

Commission's Ruling

The draft Order which was published by the Commission for public consultation provided for application of the new Tariff from 1 January to 31 March, 2016.

Regulation 9.1 of the RE Tariff Regulations specifies that the Commission shall notify the Generic Tariff for the respective RE Technologies at the beginning of each year of the Review Period except for FY 2015-16, where the Generic Tariff shall be determined by Commission within three months of the notification of the new RE Tariff Regulations. The 2nd proviso to Regulation 5.1 of the earlier RE Tariff Regulations, 2010 specified that

“...in case Regulations for the next Control Period are not notified until commencement of the next Control Period, the tariff norms as per these Regulations shall continue to remain applicable until notification of the revised Regulations...”

The Commission had extended the existing RE Tariff for the first nine months of FY 2015-16 upto 31 December, 2015 vide its Orders dated 22 April, 2015 in Case No. 34 of 2015, dated 21 July, 2015 in Case No. 92 of 2015 and dated 4 November, 2015 in Case No. 134 of 2015. This Tariff was made applicable to Projects commissioned between 1 April, 2015 and 31 December, 2015. These Orders were issued prior to the notification of the new

RE Regulations, 2015 on 10 November, 2015. In line with Regulation 9.1, the Commission is now (i.e., within 3 months of notification issue of the RE Tariff Regulations) determining the Tariff as per the new Regulations, which shall be applicable from the date of publication of these Regulations in the Official Gazette as per Regulation 1.2 till the end of the first Year of the Control Period (i.e., from 10 November, 2015 to 31 March, 2016).

1.2. Tariff to be determined based on Competitive Bidding

Suggestions and Objections

Shri Pratap Hogade on behalf of Maharashtra Veej Grahak Sanghatana, Shri Ajay Chandak and Shri Shyam D. Patil have sought that the RE Tariff be discovered through competitive bidding. There is no need for the Commission to determine any RE Tariff as the Tariff obtained through competitive bidding would be much cheaper. Especially for Solar power, the Renewable Energy Policy of Govt. of Maharashtra (GoM) dated 20 July, 2015 requires Distribution Licensees to procure such power through competitive bidding. The competitive bidding rate of Solar power has fallen to Rs. 4.63 per kWh in the recent bid. Hence, a higher Generic Tariff should not be set, at least for Solar PV and Rooftop PV. Determination of a Generic Tariff would also burden the consumers with a high Tariff for 13 years.

Commission's Ruling

Regulation 5 of the RE Tariff Regulations specifies that the Commission shall adopt the Tariff in respect of RE Projects if it is determined through a transparent process of competitive bidding conducted under Section 63 of the Electricity Act (EA), 2003. Although competitive bidding guidelines, referred to in S. 63, specific to RE have not been issued by the Central Government, Distribution Licensees in several States have conducted different forms of bidding for Solar power and obtained approvals from the respective State Electricity Regulatory Commissions. Thus, there are precedents and enabling provisions for purchase of power from RE sources through competitive bidding. However, the present Order of the Commission is only in respect of determination of Generic Tariff for procurement of power from RE sources in exercise of the powers of the Commission under the EA, 2003 and in accordance with the RE Tariff Regulations .

1.3. Revision of Tax rates as per increase in surcharge from 10% to 12% in Finance Act, 2015

Suggestions and Objections

Reliance Power Ltd. has stated that the surcharge on Income Tax has been increased from 10% to 12% through the Finance Act, 2015. Hence, the Commission may revise the surcharge on Income Tax from 10% to 12% and accordingly revise the Corporate Tax rate to 34.61% and Minimum Alternate Tax (MAT) rate to 21.34%.

Commission's Ruling

The surcharge on Income Tax has been increased from 10% to 12% through the Finance Act dated 14 May, 2015. Accordingly, the Commission is considering the revised surcharge rate of 12% for calculation of Corporate Tax and MAT rates, and the computations are shown in the Table below.

Sl. No.	Particulars	Formula	Income Tax Rate	MAT Rate
A	Income Tax Rate		30%	18.5%
B	Surcharge on Income Tax @ 12%	$B=12\%*A$	3.6%	2.22%
C	Education Cess @ 2% on Income Tax and Surcharge	$C=2\%*(A+B)$	0.67%	0.41%
D	Secondary and Higher Education Cess @ 1% on Income Tax and Surcharge	$D=1\%*(A+B)$	0.34%	0.21%
E	Total Income Tax Rate	$E=A+B+C+D$	34.61%	21.34%

The Commission has ascertained the revised surcharge from the Income Tax Department's website <http://www.incometaxindia.gov.in/charts%20%20tables/tax%20rates.htm>

1.4. Revision of Discounting Factor based on MAT rate for first 10 years

Suggestions and Objection

Reliance Power Limited has requested that the Corporate Tax be replaced with MAT for the first 10 years for calculating the post-tax interest rates while computing the discount factor due to the benefit arrived at from the provisions of 80-IA of the Income Tax Act, 1961. The discount rate should be changed to 11.76% accordingly. The discount factor computation suggested is as follows:

$$11.76\% = ((13.00\% \times 0.70 \times (1-23.55\%)) + (16.00\% \times 0.30))$$

$$\text{Where, } 23.55\% = \{(34.61\% \times 2 + 21.34\% \times 10)/12\}$$

And where 34.61% is the Corporate Tax rate and 21.34% is the MAT rate.

Commission's Ruling

While taking the investment decision, the developer considers post-tax Weighted Average Cost of Capital (WACC) as the discount rate for post-tax incremental cash flows to arrive at the Net Present Value (NPV) of the Project. The discount factor thus considered at company level WACC and varies for each company. The Commission has also drawn from the Central Electricity Regulatory Commission (CERC) Order dated 31 March, 2015 in Petition No. SM/004/2015 regarding determination of Generic Tariff for RE sources for FY 2015-16 (Para 8 of Annexure I) and the Statement of Reasons of the CERC (Terms and

Conditions for Tariff determination from RE Sources) Regulations, 2012 (Paras. 3.5.1 and 3.5.2). In its RE Tariff Order, CERC has also dealt with this objection in a similar manner and has approved the discount factor as $10.81\% = ((13.00\% \times .70 \times (1-33.99\%)) + (16.00\% \times .30))$.

Therefore, considering these facts, the Commission has continued with the discount factor computation as was set out in its draft Generic Tariff Order, but with a change in the Corporate Tax rate from 33.99% to 34.61%. This is also referred to at para 2.7 below.

1.5. RE Tariff determined by Commission is on higher side

Suggestions and Objections

Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) has stated that the Generic RE Tariff determined by Commission is high as compared to other States. The Tariff for all RE technologies should be close to the Average Power Purchase Cost (APPC) so that the promotion of RE does not over burden MSEDCL's consumers. MSEDCL has also compared the RE Tariffs in the draft Generic Tariff Order with its APPC price to demonstrate the higher Tariff of RE sources. MSEDCL has pointed out that Solar Tariff has been falling in the last couple of years, with recent competitive bidding in Andhra Pradesh drawing a Tariff of Rs. 4.63/Unit. MSEDCL has agreed to purchase 500 MW of Solar power at Rs. 5.50/unit from the Solar Energy Corporation of India (SECI).

Commission's Ruling

The Commission has determined the Generic Tariff for all RE Technologies based on the norms specified in the RE Tariff Regulations. While those Regulations have attained finality and cannot be at issue in these proceedings, it may be mentioned that, while framing the RE Tariff Regulations, the Commission took into account the norms and parameters considered by CERC and other State Electricity Regulation Commissions (SERCs), actual norms and parameters for existing Projects available from the Maharashtra Energy Development Agency (MEDA) and the Rural Electrification Corporation (REC), and indexation/escalation over the existing norms. The norms specified in the RE Tariff Regulations were finalised by the Commission after a process of public consultation in which MSEDCL also provided its comments. Moreover, the factual position is that the Tariffs set by the Commission are prudent and comparable with those set by CERC and several other SERCs.

Further, RE technologies are in general yet to achieve grid parity, and hence the Tariffs for RE technologies are bound to be higher. Further, APPC is the average of power purchase cost from all sources, including power purchase from very old plants; hydro power plants etc., the Tariffs for which are relatively low. Considering this, the APPC is likely to be on

the lower side as compared with the Tariffs for newer plants, including RE Projects. Thus, MSEDCL's comparison of RE Tariffs with the APPC is not appropriate.

1.6. Benefits of Capital Subsidy to be considered for Tariff Determination

Suggestions and Objections

MSEDCL has stated that the Commission has not considered the benefits of Capital Subsidy/Electricity Duty Exemptions/Grants/Incentives for non-conventional sources in its Draft Tariff Order.

MEDA has also stated that, in case of Bagasse-based Co-Generation Projects, cane purchase tax exemption is allowed for the first 10 years from the date of commissioning. MEDA has also stated that capital subsidy is given to Bagasse-based Co-Generation, Biomass and Small Hydro Projects under the RE Policy 2008 and 2014. MEDA has suggested that such subsidy and tax exemptions be included while calculating the RE Tariff as they are mostly fixed in nature.

Commission's Ruling

The Commission is aware that certain subsidies, Electricity Duty exemptions, grants and incentives are provided for different RE technologies based on State and Central Government Policies, etc. Considering this position, an enabling provision for considering these while determining the Tariff has been provided in Regulation 24 of the RE Tariff Regulations. The proviso to Regulation 24 provides for deduction of such grants, subsidy or incentives by Distribution Licensees in the subsequent bills raised by Project developers as follows:

“24. Grant, Subsidy or Incentive from the Central/State Government

*...Provided further that **any such grant, subsidy or incentives availed** by a Project Entity **shall be deducted by the Distribution Licensee in subsequent bills raised by the particular Project Entity towards sale of electricity in suitable installments or within such period as may be stipulated by the Commission;**”*

Thus, in this manner the impact of any such grant, subsidy or incentives availed by a Project Entity is already taken into account in the Regulations.

The nature or quantum of such subsidies, etc. and their applicability to different Projects vary from time to time. Consequently, the Commission has not considered them for the computation of the Generic Tariff but have provided in the RE Tariff Regulations for their deduction by Distribution Licensees.

1.7. Revision of Interest on Long Term Loans and Working Capital Loans

Suggestions and Objections

Maha Co-Gen Green Power Producers Association sought that the interest allowed on long term loans and working capital loans be considered as 13.50%, in line with present funding norms. Cogeneration Association of India suggested that interest on long term loans be considered at the rate of 13.50% and interest on working capital at the rate of 14%.

Commission's Ruling

Regulation 15.2 of the RE Tariff Regulations specifies the interest rate on long term loans as the Base Rate of the State Bank of India (SBI) prevailing during the previous year plus 300 basis points. Regulation 18.3 specifies that Interest on Working Capital (IoWC) shall be the average of the SBI Base Rate prevalent during the previous year, plus 350 basis points. The Commission had also considered the interest rates allowed by CERC and other SERCs for Long Term Loans and Working Capital Loans while formulating the Regulations. Accordingly, the Commission has considered both the interest on long term loans and interest on working capital loans in line with these provisions of the RE Tariff Regulations.

1.8. Revision of Depreciation

Suggestions and Objections

Maha Co-Gen Green Power Producers Association requested the Commission to retain depreciation of Rs. 0.53 per unit as per the last Tariff Order for FY 2014-15 considering the repayment obligation of Co-Generation Plants.

Commission's Ruling

Regulation 16.2 of the RE Tariff Regulations specifies that the depreciation rate for the first 12 years of the Tariff Period shall be 5.83% per annum, and the remaining depreciation shall be spread over the remaining useful life of the Project from the 13th year onwards. The allowed depreciation during the 13-year Tariff Period works out to 70%, which is sufficient to meet the debt service obligations. Accordingly, the Commission has considered depreciation in line with these provisions of the RE Tariff Regulations.

1.9. Revision of Return on Equity

Suggestions and Objections

Maha Co-Gen Green Power Producers Association requested the Commission to consider Return on Equity (RoE) of Rs. 0.65 per unit.

Commission's Ruling

Regulation 17 of the RE Tariff Regulations specifies that the rate of RoE shall be computed by grossing up the Base Rate with the tax rate equivalent to the weighted average of the MAT during the year for the first 10 years from the Commercial Operation Date (COD), and the weighted average of the normal tax rate during the year for the remaining years of Project life. The Commission has considered ROE in line with these provisions of the RE Tariff Regulations.

1.10. Revision of Clause 2(p) of RE Tariff Regulations relating to definition of Hybrid RE Projects

Suggestions and Objections

ReGen Power Tech Private Limited suggested that the Commission revise Clause 2(p) for Hybrid RE Projects since these are already covered in Clause 2 (m)(x).

Commission's Ruling

Regulation 2(p) of the RE Tariff Regulations defines the term 'Hybrid RE Projects', while Regulation 2(m) defines, through a listing, the term 'Eligible Projects'. Hence, both definitions are required in RE Tariff Regulations. Whatever be the case, the present proceedings are for determination of the Generic Tariff and not the Regulations.

1.11. Power Purchase Agreement with MSEDCL

Suggestions and Objections

Ruchi Soya Ind. Ltd. submitted that it be made mandatory for the Distribution Licensee, including MSEDCL, to sign Power Purchase Agreements (PPAs) with agricultural produce warehouses with Rooftop Solar PV installations. Such Rooftop Solar plants not only promote distributed renewable power generation but also reduce moisture evaporation and weight loss in the stored agri-commodities.

Cogeneration Association of India submitted that the MSEDCL has expressed its inability to sign PPAs with several new Bagasse-based Co-Generation Projects, stating that its Renewable Purchase Obligation (RPO) target for energy purchase from renewable sources has been achieved. Considering that the Government plans to add 14,400 MW of RE power out of which 1000 MW would be by way of Bagasse and Biomass-based Projects, the Commission should issue guidelines or directives to MEDA and MSEDCL to issue infrastructure clearances and sign PPAs with such Projects.

Commission's Ruling

The Commission has notified the MERC (Renewable Purchase Obligation, its compliance and REC framework Implementation) Regulations, 2010 to promote RE in the State, and its compliance is verified by the Commission yearly in suo-moto proceedings. It may be mentioned that, in respect of FY 2013-14, the Commission found in Case No. 190 of 2014 that MSEDCL had not been able to fulfil its RPO targets. The RPO Regulations require all Obligated Entities to fulfil certain RPO targets. The Commission has also recently issued the MERC (Net Metering for Rooftop Solar Systems) Regulations, 2015 to enable Solar producers below 1 MW to connect to the distribution network.

RE TECHNOLOGY-WISE COMMENTS

WIND POWER RELATED

1.12. Increasing Tariff Period from 13 years to 25 years

Suggestions and Objections

Inox Wind Ltd. and Inox Renewables Ltd. have sought that the Tariff Period for Wind Projects be increased from 13 years to 25 years in line with Tariff Period considered by other States. The useful life of Wind Projects is 25 years, and hence that would be more logical.

Commission's Ruling

Regulation 7.1 of the RE Tariff Regulations specifies that the Tariff Period for Wind Power Projects would be 13 years, and the Draft Order reflects these legal provisions. The support provided by the Regulations during the 13-year Tariff Period provides certainty to the Project developers for meeting debt service obligations. The Commission has accordingly considered the Tariff Period of 13 years in this Order.

1.13. Revision of Capital Cost and O&M expenses

Suggestions and Objections

Inox Wind Ltd. and Inox Renewables Ltd. have asked that the capital cost of Wind Projects be revised to the range of Rs. 650 to 700 lakh per MW in line with the market value of wind turbines on turnkey basis in Maharashtra. Indian Wind Turbine Manufacturers Association (IWTMA) has also suggested revising the Capital Cost to Rs. 619.52 lakh/MW in line with CERC Regulations and considering the additional cost of land development charges, statutory fees, insurance costs, long transmission lines and Right of Way (ROW) issues.

Inox Wind Ltd., Inox Renewables Ltd. and IWTMA have also stated that the new RE Tariff Regulations specify the Capacity Utilisation Factor (CUF) at 80 meters hub height as

against 50 meters specified in the previous Regulations. This increases the Capital Cost, which should be considered while determining Tariff.

Inox Wind Ltd. and Inox Renewables Ltd. have further asked that the commission accordingly revise the Operation and Maintenance (O&M) expenses allowed (percentage of Capital Cost). IWTMA has proposed revision of the O&M expenses to Rs. 14 lakh/MW, considering the actual O&M expenses, including forecasting, for existing plants.

ReGen Power Tech Private Limited has requested the Commission to exclude costs relating to forecasting and scheduling from the Capital Cost, and approve a Capital Cost of Rs. 619.16 lakh/MW in line with the CERC Regulations. The O&M expenses may also be revised upwards to Rs. 10.63 lakh/MW with escalation of 5.72%, in line with CERC Regulations. Further, in para. 3.10 of the Draft Generic Tariff Order, a reference has been made to Regulation 29.2 of the RE Tariff Regulations regarding escalation rate of O&M expenses. The relevant provision is Regulation 29.1.

Commission's Ruling

Regulation 26.2 of the RE Tariff Regulations specifies that the Capital Cost for Wind Energy Projects shall be considered as Rs. 600.74 lakh/MW in the first year of the Review Period for the purpose of Tariff determination. This would be escalated in each subsequent year in accordance with the Regulation 27. These provisions have been applied in the present Order. While the Regulations cannot be at issue in these proceedings, it may be mentioned that this Capital Cost was finalised while framing the Regulations by considering the Capital Cost norms of other States and CERC and Capital Cost indexation over the base year Capital Cost of FY 2014-15, and after public consultation.

The O&M expenses have been considered based on Regulation 29.1 of the RE Tariff Regulations. Since no change in Capital Cost has been made, the O&M expense computation for Wind Projects has been kept the same, i.e., 1.47% of the Capital Cost.

Escalation to O&M expenses has been considered as per Regulation 29.2. Hence, Regulation 29.2 was referred to when dealing with the escalation rate for O&M expenses in para. 3.10 of the Draft RE Tariff Order.

1.14. Zoning of Wind Power Projects

Suggestions and Objections

Inox Wind Ltd. and Inox Renewables Ltd. have sought that a Tariff be provided for only one wind zone, i.e., <250 WPD and CUF 22%, as most of the new Projects are in Wind Zone 1 only. Moreover, most of the other States have a single Tariff for the entire State although they may have different Wind Zones.

IWTMA and Indian Wind Energy Association (InWEA) have stated that National Institute of Wind Energy (NIWE), whose material has been used by the Commission for the RE Tariff Regulations, is yet to complete its study for validation of the Wind Resource Assessment and corresponding Wind Power Density (WPD) at 80 m. hub height. NIWE would thereafter issue validated data regarding WPD at 80 m. hub height. Till such validated data is published, IWTMA has urged that the current zoning certificate issued by MEDA be continued.

ReGen Power Tech Private Limited has sought that the present four Wind Zones be realigned as per CERC norms of five Zones by including an additional Zone 1 with 20% CUF.

Commission's Ruling

Under Regulation 28.1 of the RE Tariff Regulations, Wind Zones are based on annual mean wind power density and CUF. The Tariff is, therefore, determined for all the four Wind Zones in line with these provisions. Zone-wise CUF has also been prescribed by CERC and in the Commission's earlier RE Tariff Regulations, 2010. The purpose of having a Zone wise CUF approach is to enable investment at sites with varying WPD and providing a higher Tariff for Projects in lower WPD Zones.

In any case, the present Order has to be within the framework of the provisions of the RE Tariff Regulations, and reconsideration of those provisions or their underlying rationale is outside the ambit of these proceedings. It may be observed, however, that most sites with better wind potential have been utilized prior to the Zone-wise approach with old technology (lesser MW capacity) wind turbines operating at a lower hub height. It is possible that, among other things, Projects with WEG installed at lower hub heights at sites with higher CUF may opt for Re-Powering of existing WEGs with higher MW turbines at a greater hub height. In that event, a uniform CUF across the State may lead to Distribution Licensees having to pay a higher, uniform Tariff even for Projects in the present Wind Zones 2, 3 & 4. Moreover, the market trend is towards increasing hub heights, as shown in the Approach Paper underlying the initial draft of the RE Tariff Regulations. Further, the Capital Cost in the RE Tariff Regulations takes into account higher capacity/rotor diameter/hub-height of WTG installations.

As far as any subsequent data of relevance that may become available in future from NIWE is concerned, it would be open to the Commission to consider it appropriately at that time in the context of the Regulations.

1.15. Accelerated Depreciation benefit for Wind Power Projects

Suggestions and Objections

MSEDCL has requested the Commission to appropriately factor in the Accelerated Depreciation (AD) benefit of 80% while determining the Tariff for Wind Power Projects.

InWEA has asked that the computation of tax depreciation benefit and the corresponding levelised Tariff for Wind Power Projects be reviewed. While the AD benefit has been taken as 100% for full year, the book depreciation has been taken only for half year in the 1st year of the Project.

Commission's Ruling

The Commission has revised the computation of book and tax depreciation in the levelised Tariff considering the above as detailed in para 2.7, the computations for which are set out in Annexures 1A to 1D of this Order.

BIOMASS RELATED

1.16. Revision of Capital Cost

Suggestions and Objections

Maharashtra Biomass Energy Developers Association, Yash Agro Energy Limited, Greta Group, Spark Green Energy (Satara) Pvt. Limited, Spark Green Energy (Ahmednagar) Pvt. Limited and Kalyani Renewable Energy India Limited have requested that the Capital Cost for Biomass-based Projects be brought on par with the Capital Cost adopted by CERC, considering that the actual Project costs are much higher. Spark Green Energy (Satara) Pvt. Limited, Spark Green Energy (Ahmednagar) Pvt. Limited and Kalyani Renewable Energy India Limited have submitted audited balance sheets in support of higher Project cost. A.A. Energy Limited has requested the Commission to consider Capital Cost as Rs. 540 lakh/MW.

Commission's Ruling

Regulation 38 of the RE Tariff Regulations specifies the Capital Cost of Biomass-based Power Projects as Rs. 494.32 lakh/MW for the first year of the Review Period for Tariff determination, to be revised in respect of Projects commissioned in each subsequent year of the Review Period. It may be mentioned that this Capital Cost was finalised at the time of framing of the Regulations by considering the existing Capital Cost norms of CERC and other SERCs and Capital Cost indexation over the base year Capital Cost of FY 2014-15. In any event, the Commission has considered the Capital Cost as per the RE Tariff Regulations.

1.17. Lowering of PLF

Suggestions and Objections

Maharashtra Biomass Energy Developers Association has stated that, in practice, it is very difficult to operate a Biomass plant at 80% Plant Load Factor (PLF). Hence, the PLF of such Projects, after stabilization, be revised to below 70%.

Commission's Ruling

Regulation 40 of the RE Tariff Regulations specifies the PLF of Biomass-based Power Projects after the stabilization period. The PLF norms were finalised at the time of framing of the Regulations also considering the norms of other States and CERC. The PLF considered in this Order is in line with the Regulations.

1.18. Uniform GCV and SHR for all Biomass-based Projects

Suggestions and Objections

Maharashtra Biomass Energy Developers Association, Yash Agro Energy Limited and Greta Group have suggested that uniform Gross Calorific Value (GCV) and Station Heat Rate (SHR) be applied for all Biomass-based Projects as they cannot be differentiated based on the year of commissioning. New plants would be more efficient and, accordingly, the SHR for older plants should be at least equal to that of new plants. Therefore, the Tariff should be revised on the basis of revised SHR and GCV, and applied to all plants. A.A. Energy Limited proposed a Calorific Value of 3100 kCal/kg.

Commission's Ruling

While framing the earlier RE Tariff Regulations, 2010 for the previous Control Period, sufficient baseline data were not available for finalising the SHR and GCV for Biomass Projects, and the Commission relied on the CERC norms as well as the Commission's earlier Orders. While finalising the present RE Tariff Regulations, baseline data of SHR and GCV of existing Projects in the State was also obtained from MEDA. The Commission took into consideration this baseline data also, while looking at the norms of CERC and other SERCs and its own Orders.

As per Regulation 37.2 of the RE Tariff Regulations, 2015, the fuel-related aspects specified in Regulations 44 to 50 are applicable to both existing and new Biomass-based Power Projects except for the SHR and Auxiliary Consumption norms.

According to Regulation 3.2, the norms for SHR and Auxiliary Consumption for existing Biomass-based Power Projects shall be as stipulated in the respective RE Tariff Orders. However, considering the objections and suggestions received, the Commission has deliberated on the issue of retaining the SHR for the old Biomass Projects as per the

respective RE Tariff Orders. The Commission notes that, by retaining the SHR of 3800 Kcal/KWh for old Projects while raising it to 4200 Kcal/KWh for new Projects, the RE Tariff Regulations have specified a higher efficiency norm for old Projects. The Commission accepts the contention that new Projects should have efficiency norms as compared to the older ones, and is of the view that the SHR norm for existing Biomass Projects should be higher or at least equal to that of new Projects.

Therefore, in exercise of its power to remove difficulties under Regulation 82 of the RE Tariff Regulations, the Commission has revised the SHR for existing Biomass-based Power Projects specified in the 1st proviso to Regulation 37.2 in this Order. The Commission now stipulates that, for existing Projects also, the SHR would be considered as 4200 Kcal/KWh.

The GCV for the existing Biomass-based Power Projects has been considered as 3611 Kcal/kg, in line with Regulation 37.2 read with Regulation 48 of the RE Tariff Regulations.

1.19. Tariff for Existing Projects prior to FY 2013-14

Suggestions and Objections:

Maharashtra Biomass Energy Developers Association urged that the Tariff for Projects commissioned prior to FY 2013-14 also be revised considering the fact that parameters like fuel price, SHR and GCV cannot be differentiated as between newer and older plants.

Commission's Ruling

The Commission has deliberated this issue in the above para 1.18 of this Order.

1.20. Revision of Auxiliary Consumption

Suggestions and Objections

Greta Group and A.A. Energy Limited have requested that Auxiliary Consumption for Biomass-based plants be revised to 11%. Yash Agro Energy Limited has suggested that Auxiliary Consumption be uniform for both existing and new Projects as such efficiency parameters cannot be differentiated based on the year of commissioning.

Commission's Ruling

Regulation 41 of the RE Tariff Regulations specifies that Auxiliary Consumption for Biomass-based Projects shall be 10% for the purpose of Tariff determination. This percentage was finalised at the time of framing of Regulations by considering the norms of other SERCs, CERC and actual Auxiliary Consumption of Projects in the State. Accordingly, the Commission has considered Auxiliary Consumption as per the RE Tariff Regulations. For existing Projects, Regulation 3.2 specifies that the Tariff and other terms and conditions shall be governed by the provisions of the applicable RE Tariff Orders issued

by the Commission from time to time. Hence, the Auxiliary Consumption percentage shall be applicable as per the provisions of the RE Tariff Regulations.

1.21. Revision of O&M Norms

Suggestions and Objections

Greta Group and Yash Agro Energy Limited have sought revision of the O&M expense norms for Biomass-based plant to Rs. 44.71 lakh/MW as per CERC norms since the norm of Rs. 26.30 lakh/MW adopted is very low. A.A. Energy Limited has suggested that the O&M expenses allowed be increased cost to Rs. 42 lakh/MW

Commission's Ruling

Regulation 43 of the RE Tariff Regulations specifies that Normative O&M expenses for the base year of the Review Period shall be 5.32% of the Capital Cost for the purpose of Tariff determination, which is also in line with the percentage considered in the earlier RE Tariff Regulations, 2010 for the previous Control Period. Also, this O&M expense norm was determined at the time of framing of Regulations by considering the norms of CERC, other SERCs and actual O&M of Projects based on data from MEDA and REC. The O&M expense norms of Biomass Projects adopted in this Order are as per the provisions of the RE Tariff Regulations.

SOLAR RELATED

1.22. Revision of Tariff Period

Suggestions and Objections

MSPGCL and Hindustan EPC Company have requested that the Tariff Period for Solar PV Projects be increased to 25 years instead of 13 years, as per the CERC Regulations. The Tariff uncertainty beyond 13 years will pose a revenue risk for developers and will lower the attractiveness of investment in the Solar power sector.

Shri Pratap Hogade representing Maharashtra Veej Grahak Sanghatana, Shri Ajay Chandak and Shri Shyam D. Patil have, on the other hand, suggested a decrease in the Tariff Period of 13 years considering the decline in rates of Solar Projects.

Commission's Ruling

Regulation 7.1 of RE Tariff Regulations specifies that Tariff Period for Wind Power, Biomass-based, Solar PV, Solar Roof-top PV and Non-Fossil Fuel-based Co-Generation Projects shall be 13 years. The Commission is of the view that the regulatory support during the 13-year Tariff period will provide certainty sufficient to address debt service obligations

which would be discharged during this period. The Commission has accordingly considered a Tariff Period of 13 years in this Order.

1.23. Revision of Capital Cost

Suggestions and Objections

Shri Pratap Hogade representing Maharashtra Veej Grahak Sanghatana, Shri Ajay Chandak and Shri Shyam D. Patil have contended that the Capital Cost of Solar PV of Rs. 605.85 per MW is very high. At the recent InterSolar Exhibition, most of the world's leading companies were quoting Capital Cost at Rs. 540 lakh/MW or less for Solar PV Projects.

Commission's Ruling

The Commission has determined the Capital Cost and Tariff for Solar PV Projects based on Regulation 69 of the RE Tariff Regulations. While formulating the Regulations, the Commission had considered the Capital Cost data of existing plants received from MEDA and REC and cost per MW approved by CERC in its Generic RE Tariff Order in Petition No. SM/005/2015 dated 31 March, 2015. Hence, the Capital Cost adopted in this Order is as per the RE Tariff Regulations.

1.24. Revision of O&M expenses

Suggestions and Objections

Shri Pratap Hogade representing Maharashtra Veej Grahak Sanghatana has stated that the O&M expense norm of Rs. 13 lakh/MW is very high. Shri Ajay Chandak and Shri Shyam D. Patil have suggested that the Commission approve Rs. 8 lakh/MW as O&M expense for Solar PV Projects, which is the current market level.

Commission's Ruling

Regulation 71.1 of RE Tariff Regulations specifies that O&M expenses of Solar PV Projects for the base year of the Review Period shall be Rs. 13 lakh/MW. That is also in line with O&M expenses approved by the CERC in its Generic RE Tariff Order in Petition No. SM/005/2015 dated 31 March, 2015. Thus, the O&M expenses have been considered as per the provisions of the RE Tariff Regulations.

1.25. Solar Thermal technology to be discontinued

Suggestions and Objections

Shri Pratap Hogade of Maharashtra Veej Grahak Sanghatana, Shri Ajay Chandak and Shri Shyam D. Patil have suggested that Solar Thermal Power Projects be omitted since there

has not been an appreciable drop in prices over the years, unlike in the case of Solar PV Projects.

Commission's Ruling

Regulation 9.1 of the RE Tariff Regulations specifies that the Commission shall notify the Generic Tariff for the respective RE Technologies, with certain exceptions. This is to promote RE Projects in the State for a range of different technologies. Hence, in line with these Regulations, the Commission has determined the Generic Tariff for the specified RE Technologies. The Commission observes that the Solar PV technology has matured over time and prices have fallen partly due to economies of scale. This has been possible as the Solar PV technology was promoted through various means even when its Tariff was high. Similarly, in line with the MNRE approach, the Commission intends to similarly promote the RE technologies which are feasible in the State. Accordingly, the Commission has determined the Generic Tariff for various RE technologies, including Solar Thermal.

CO-GENERATION RELATED

1.26. Revision of SHR

Suggestions and Objections

Maha Co-Gen Green Power Producers Association and Cogeneration Association of India have requested the Commission to consider SHR of at least 4200 kCal/kWh for Tariff determination instead of 3600 Kcal/kWh. In support, the actual SHR of existing Co-Generation power plants operating in Maharashtra was presented, and the average of these actuals (i.e., 4675 kCal/kwh derived by Maha Co-Gen Green Power Producers Association and 5541 kCal/kwh by Cogeneration Association of India) was sought for Tariff determination. It was pointed out that, while the Commission has revised the SHR for Biomass-based Projects from 3800 Kcal/Kwh to 4200 kCal/kwh, that was not done for Co-Generation Projects.

Commission's Ruling

Regulation 57 of RE Tariff Regulations specifies that SHR of 3600 kcal/kWh be considered for the Tariff determination for Co-Generation Projects. While finalising the Regulations, the Commission took into account the SHR norms considered in its earlier RE Tariff Regulations of 2010 and the Orders/Regulations of CERC and other SERCs. Thus, the Commission has considered SHR of 3600 kcal/kWh in this Generic Tariff Order as per the norms of the RE Tariff Regulations.

1.27. Revision of Auxiliary Consumption

Suggestions and Objections

Maha Co-Gen Green Power Producers Association and Cogeneration Association of India have suggested that Auxiliary Consumption of 10% be considered instead of 8.5%, in line with Biomass-based Projects. It was contended that the actual Auxiliary Consumption of existing Co-Generation plants was close to 10%. Maha Co-Gen Green Power Producers Association further stated that, during the peak season, the entire sugar plant power consumption is met by the Co-Generation plant, and should be considered as additional Auxiliary Consumption.

Commission's Ruling

Regulation 56 of the RE Tariff Regulations specifies that Auxiliary Consumption shall be 8.5% for the purpose of Tariff determination for Co-Generation Projects. While finalising the Regulations, the Commission took into account the Auxiliary Consumption norms considered in its previous Regulations, and the Orders/Regulations of CERC and other SERCs. Hence, the Commission has considered Auxiliary Consumption of 8.5% in this Order for Co-Generation Projects.

1.28. Revision of Capital Cost

Suggestions and Objections

Maha Co-Gen Green Power Producers Association proposed that Capital Cost should be Rs. 550 Lakh/MW, considering the cost involved with the technology used for setting up such plants and undertaking modifications in the sugar plant. Moreover, most of the Co-Generation Projects are at remote locations, where the evacuation facility of the Transmission Licensee is not available. Consequently, the developer has to lay long evacuation lines till the inter-connection point, increasing the Project cost.

Co-Generation Association of India has also stated that the Capital Cost considered by the Commission is far below the actual cost. The Capital Cost should be revised as per the actual cost incurred by developers and additional modernisation costs incurred by Bagasse-based plants.

Commission's Ruling

Regulation 53 of the RE Tariff Regulations specifies that the normative Capital Cost for Non-Fossil Fuel-based Co-Generation Projects shall be considered as Rs. 489.02 lakh/MW for the first year of the Review Period for the purpose of Tariff determination, and shall be revised for Projects to be commissioned in each subsequent year as specified in the Regulations. This Capital Cost norm was finalised in the Regulations by considering the norms of CERC and other SERCs, the actual Capital Cost of similar Projects collected from *RE Tariff Order (Suo-Moto) for FY 2015-16 (10 November, 2015 to 31 March, 2016)*

REC and MEDA, and Capital Cost indexation over the base year Capital Cost of FY 2014-15. The Commission has considered the Capital Cost of Co-Generation power Projects as per the RE Tariff Regulations.

1.29. Revision of O&M cost

Suggestions and Objections

Maha Co-Gen Green Power Producers Association has sought revision of the O&M expense norms to Rs. 0.58 per unit as per the CERC norms. Cogeneration Association of India suggested an increase to Rs. 26 lakh/MW considering the actual costs incurred by commissioned Projects.

Commission's Ruling

Regulation 58 of RE Tariff Regulations specifies that the O&M expenses during the base year of the Review Period shall be 3.54 % of the Capital Cost for the purpose of Tariff determination. This is also in line with the percentage considered in the earlier RE Tariff Regulations for the previous Control Period, and adopted after considering the norms of CERC and other SERCs. The Commission has considered the O&M expense norms of Co-Generation Projects as per the provisions of the RE Tariff Regulations.

1.30. Revision of Tariff

Suggestions and Objections

Maha Co-Gen Green Power Producers Association sought an increase in the Tariff to a minimum of Rs. 7.97 per unit.

Commission's Ruling

The Tariff for Non-fossil fuel-based Co-Generation Projects has been determined by the Commission as per the respective norms specified in the RE Tariff Regulations.

1.31. Dual Tariff for Non-Fossil fuel based Co-generation Power Projects

Suggestions and Objections

Yash Agro Energy Limited submitted that Biomass based Co-Generation plants have similar parameters (i.e., Capital Cost, SHR, Auxiliary Consumption, O&M expenses) as those of Biomass-based plants. Also, unlike bagasse which is a captive fuel source, the biomass for Co-Generation Projects is sourced from outside, as in the case of Biomass based Projects. Considering this, the Commission may determine a dual Tariff based on fuel type (Bagasse or Biomass) and fuel source (captive or otherwise). Alternatively, the Tariff

for Biomass based Co-generation plants should be the same as that for Biomass-based Projects.

Commission's Ruling

Regulation 60.2 of the RE Tariff Regulations specifies that, for those Non-Fossil fuel-based Co-generation plants which are using biomass other than bagasse, the biomass fuel prices as specified under Regulation 49 shall be applicable. Projects using biomass other than bagasse may approach the Commission for a Project-specific Tariff.

1.32. Tariff for Expansion Projects

Suggestions and Objections

Gangamai Industries and Construction Limited and Cogeneration Association of India have stated that some of the existing old Co-Generation plants have undertaken expansion. While signing PPAs with these Projects, the Distribution Licensees have considered the old and the newly expanded capacity as a single Project. Accordingly, the Tariff for the newly expanded Project remained the same as that applicable for the existing old Project. This makes expanded Project unviable as the Capital Cost incurred for expansion is higher than that for the old Project. Accordingly, they sought that the Tariff for expansion Projects be as per the RE Tariff Regulations applicable to the corresponding year. Gangamai Industries and Construction Limited set out the example of its existing 12 MW Co-Generation Project commissioned in December, 2011 and expansion Project of 20 MW to be commissioned soon. While signing the PPA for 20 MW proposed capacity, the Licensee has considered the existing old (12 MW) and the proposed capacity (20 MW) as a single Project and applied the same Tariff for the newly expanded Project as applicable to the existing plant.

Commission's Ruling

Regulation 3.2 of RE Tariff Regulations specifies that the Tariff and other terms and conditions applicable to existing RE Projects shall be governed by the provisions of the RE Tariff Orders issued by the Commission from time to time. In case of expansion of an existing Project, the Tariff Order corresponding to the date of commissioning of the expanded capacity of the Project is applicable. Thus, the Regulations are clear and should be adhered to. In case of any dispute, the Commission can be approached in separate proceedings.

1.33. Revision of Fuel Cost

Suggestions and Objections

Cogeneration Association of India has asked for a higher fuel cost of bagasse to be considered, i.e., at least Rs. 2500/MT, for determination of Tariff for these Projects, and

stated that the landed price of bagasse was in the range of Rs. 2500- 3000/ MT in FY 2013-14.

Commission's Ruling

Regulation 60.1 of the RE Tariff Regulations specifies that the price of bagasse shall be considered as Rs. 2326.84 /MT during the first year of the Review Period for the purpose of Tariff determination, and shall thereafter be linked to the indexation formulae specified in Regulation 61. This fuel cost is also the same as considered in the CERC Order in Petition No. SM/004/2015 dated 3 March, 2015 for Non-Fossil Fuel-based Co-Generation Power Projects. The Commission has accordingly considered fuel cost as per the RE Tariff Regulations in the present Order.

SMALL HYDRO RELATED

1.34. Evacuation cost beyond inter-connection point and corresponding subsidy

Suggestions and Objections

Shri T.P. Vartak representing Hydro Power Association of India stated that the RE Policy of Maharashtra dated 20 July, 2015 GoM's notification on methodology dated 9 September, 2015 state that the evacuation expense can be borne by developers, including sub-station augmentation, if any, and the developer would be reimbursed upto a maximum Rs. 1 Crore by MEDA from the Green Cess. If the cost exceeds Rs. 1 Crore, the extra burden is on the developer. Hence, the Commission should either reimburse the entire cost of evacuation beyond the inter-connection point to the Small Hydro Project (SHP) developer or consider the cost of such evacuation over and above the subsidy in the Capital Cost of the Project. Considering this additional impact of evacuation cost, the Capital Cost norm may be increased to Rs. 850-950 lakh/MW for Mini and Micro Hydro Projects.

MEDA stated that the RE Project developers are reimbursed the Capital Cost incurred by them for construction of evacuation line beyond the inter-connection point as per provisions of State RE Policy. That amount should not be considered as incentive/grant/subsidy received by the developer as it is a reimbursement given in lieu of capital expenditure incurred by him. Accordingly, that amount should not be deducted by the Distribution Licensee in the subsequent bills of Project developers as per Regulation 24 of the RE Tariff Regulations.

Commission's Ruling

The Commission has determined the capital cost for determination of Tariff for SHPs considering the cost and other factors upto the inter-connection point as defined in Regulation 2.1 (z) of the RE Tariff Regulations. The costs incurred by RE developers after the inter-connection point cannot, therefore, be included in the Capital Cost of the Project.

Also, the cost of evacuation beyond the inter-connection point and related subsidy and reimbursement issues are not covered in the Regulations. The issue of the Distribution Licensee's obligations beyond the inter-connection point and differences in the Policies of different GoM Departments in this regard are being separately addressed from time to time by the Commission in various Orders.

Regulation 24 provides for deduction of any grant, subsidy or incentive offered by the Central or State Government or their agencies by the Distribution Licensee in subsequent bills. Further, Regulation 2(z) of Tariff Regulations defines a 'Project' as

“a Generating Station and the evacuation system up to the inter-connection point, as the case may be; and, in case of a Small Hydro Power Generating Station, includes all components of the generating facility such as the intake water conductor system and generating Units of the Scheme, as apportioned to power generation;”

Therefore, any deduction of grant, subsidy or incentive under Regulation 24 would be limited to the Project cost of the Generating Station and the evacuation system upto the inter-connection point. Hence, any evacuation cost beyond the inter-connection point does not form the part of Project cost, and such amount cannot be deducted by a Distribution Licensee from the bills raised by Project developers.

1.35. Revision of Capital Cost for Mini and Micro Hydro Power Projects

Suggestions and Objections

Shri T.P. Vartak representing Hydro Power Association of India stated that the actual Capital Cost of Mini and Micro Hydro power is in the range of Rs. 850 lakh/MW and Rs. 950 Lakh/MW, respectively, and submitted the policy document of the National Mission on Small Hydro. If the Capital Cost norm cannot be revised, any capital grant or subsidy received for such Projects should not be passed on to the Distribution Licensee as per Regulation 24 of the RE Tariff Regulations.

Commission's Ruling

The Commission has determined the Tariff for Mini and Micro Hydro Power Projects in this Order considering Regulation 35 of the RE Tariff Regulations, which reads as follows:

“The Tariff for Mini Hydro Power Projects with capacity of 1 MW and less but more than 500 kW shall be higher by Rs 0.50 per kWh than that applicable to Small Hydro Power Projects with installed capacity of 5 MW or less but more than 1 MW.

The Tariff for Micro Hydro Power Projects with capacity of 500 kW and below shall be higher by Rs. 1.00 per kWh than that applicable to Small Hydro Power Projects with installed capacity of 5 MW or less but more than 1 MW.”

Thus, the Regulations do not provide for separate Capital Cost determination for Mini and Micro Hydro Power Projects, and envisages instead that the Tariff for such Projects will be

based on that of other SHPs but with a mark-up. The present Order follows this dispensation.

PROJECT-SPECIFIC RELATED

1.36. Tariff for Wind-Solar Hybrid Power Projects

Suggestions and Objections

ReNew Power Ventures Private Limited has suggested that the Commission apply the existing Wind Energy Project feed-in Tariff for the Solar component of Hybrid Wind-Solar Projects as well. The Solar and Wind components of such Projects are usually complementary, and hence the Distribution Licensees would benefit from more consistent and less variable power, enabling better planning and grid stability. The developer would also be able to sell Solar power even at the same rate as for Wind Energy. The Commission may issue directions to MSEDCL to amend the existing PPA or enter into a supplementary agreement for such Hybrid Project accordingly.

Commission's Ruling

Regulation 2(p) of the RE Tariff Regulations defines 'Hybrid RE Project' as one that uses a combination of RE technologies approved by MNRE for electricity generation within the same premises. Solar-Wind Hybrid RE Projects are, accordingly, also within the purview of these Regulations. The Commission recognises that a Solar-Wind Hybrid Project has benefits arising from some complementarity between the two sources of RE. The use of common premises also provides an advantage in terms of saving in capital and operational costs. However, the specific benefits and savings may differ from case to case. Hence, instead of a Generic Tariff, the Regulations provide for determination of Project-specific Tariff for such Hybrid RE Projects. Hence, the developer can approach the Commission for approval of a Project-specific Tariff.

1.37. Tariff for Industrial Waste Power Projects

Suggestions and Objection

Shri. Ratan Shah has urged that a Generic Tariff be determined for plants based on Industrial Waste. The parameters for such power plants, like Capital Cost, O&M, IoWC, Depreciation, Fuel, SHR, Auxiliary Consumption, etc, are comparable to those of Non-fossil fuel-based generation plants.

Commission's Ruling

Regulation 8.1 of the RE Tariff Regulations specifies that Project-specific Tariff shall be determined for some of the RE technologies which are approved by MNRE and not covered in the draft Tariff Order. It has to be noted that RE is an evolving space with new technology coming in from time to time and hence, it is neither possible nor prudent for the

Commission to determine Generic Tariff for all such technologies and accordingly, provision for Project-specific Tariff has been made in the Regulations. If the Project referred to is based on a RE technology approved by MNRE but no Generic Tariff is envisaged in the Regulations, a Project-specific Tariff can be sought.

1.38. Tariff for Biomass Gasifier Power Projects

Suggestions and Objections

Ruchi Soya Industries Ltd. has asked that a Generic Tariff for Biomass Gasifier plants be provided in this RE Tariff Order. Until such time as the Commission comes out with a separate Tariff Order for such Projects, the Tariff approved for Rankine Cycle-based Biomass Power Projects may be made applicable to them.

Commission's Ruling

Regulation 8.1 of the RE Tariff Regulations specifies that a Project-specific Tariff shall be determined by the Commission on a case-to case basis for those technologies which are within the purview of the Regulations but in respect of which no Generic Tariff has been envisaged. RE is an evolving field with technologies emerging technologies coming up from time to time. It is neither possible nor prudent for the Commission to determine Generic Tariffs for all such technologies. Hence, the Regulations provide for determination of Project-specific Tariffs in such cases. Developers can accordingly approach the Commission for determination of such Project-specific Tariff.

RPO COMPLIANCE RELATED

1.39. RPO Compliance

Suggestions and Objections:

Dr. Ashok Pendse, representing the Authorised Consumer Representative Thane-Belapur Industries Association (TBIA), submitted that, if the Distribution Licensee fails to comply with RPO targets, the Commission may levy a fine which can be used for purchase of REC and strengthening of the transmission network. The RPO Regulations of this Commission as well as several other ERCs enable this, and it has been supported by the Appellate Tribunal for Electricity (ATE) in its recent Judgment dated 10 December, 2015 in Appeal No. 54 of 2015 (Green Energy Association Vs HPERC).

Commission's Ruling

The compliance of the MERC (Renewable Purchase Obligation, its compliance and REC framework Implementation) Regulations, 2010 is reviewed by the Commission yearly through a suo-moto Order. Under the Regulations, all the Obligated Entities are required to fulfil their RPO targets, and there is a provision for imposition of 'RPO Regulatory

Charges'. Issues of non-compliance would be considered in those proceedings. The present proceedings are limited to the determination of Generic Tariff.

2. Common Parameters applicable for determination of Generic Tariff

This Section details the applicable norms for determination of Generic levelised Tariff, which are common to all type of RE technologies as specified in the RE Tariff Regulations.

2.1. REVIEW PERIOD

Regulation 6.1 of the RE Tariff Regulations specifies that the Review Period for determination of Tariff for RE Projects shall be five years, starting from the date of notification of the RE Tariff Regulations. The first year of the Review Period is FY 2015-16, and the Regulations were notified on 10 November, 2015.

2.2. TARIFF STRUCTURE

Regulation 10 of the RE Tariff Regulations specifies that the Tariff for RE Projects shall be a single-part Tariff consisting of the following fixed cost components:

- (a) Return on Equity;
- (b) Interest on loan capital;
- (c) Depreciation;
- (d) Interest on working capital;
- (e) Operation and maintenance expenses.

For RE technologies having fuel cost component, like Biomass-based Power Projects and non-fossil fuel-based Co-Generation Projects, a single-part Tariff with two components, viz., fixed cost component and fuel cost component, has been determined under this Order. The relevant cost components and basis for determination of Generic Tariff in respect of each RE technology have been elaborated under the technology-specific Sections of this Order.

2.3. TARIFF DESIGN

In accordance with Regulation 11, the Tariff Design for RE Generating Stations is as under:

“11.1 The tariff shall be determined on a levelised basis for the Tariff Period:

Provided that, for RE Projects having a single-part tariff with two components, the tariff shall be determined on a levelised basis considering the year of commissioning of the Project for the fixed cost component, while the fuel cost component shall be specified on the basis of the year of

operation.

11.2 For the purpose of computation of levelised tariff, a discount factor equivalent to the normative post-tax weighted average cost of capital shall be considered.

11.3 Levelisation shall be carried out for the 'useful life' of the RE Project, while tariff shall be determined for the period equivalent to the Tariff Period."

2.4. INTEREST ON LOAN

Regulation 15.1 specifies that the loan tenure of 12 years is to be considered for determination of Generic Tariff for RE Projects. Regulation 15.2 provides for consideration of the rate of interest on loan as under:

"The quantum of loan arrived at as specified above shall be considered as gross normative loan for calculation for interest on loan. The normative loan outstanding as on 1st April of every year shall be worked out by deducting the cumulative repayment up to 31st March of previous year from the gross normative loan.

For the purpose of computation of tariff, the Base Rate of the State Bank of India prevailing during the previous year plus 300 basis points shall be considered as the normative interest rate.

Notwithstanding any moratorium period availed, the repayment of loan shall be considered from the first year of commercial operation of the Project and shall be equal to the annual depreciation allowed."

The Base Rate as notified by State Bank of India (SBI) for the period from 1 April, 2014 to 31 March 2015, is as below:

Period	Base Rate (%)	Period (no of days)
1 April, 2014 to 31 March, 2015	10.00%	365

Note: The Base Rate is considered as 10 %, which was constant for FY 2014-15 as per the SBI Notification effective from 7 November, 2013 upto 9 April, 2015. This is provided on the SBI Website [<https://www.sbi.co.in/portal/web/interest-rates/base-rate-historical-data>]. In its suo-moto Order dated 31 March, 2015 in Petition No. SM/004/2015 for determination of Generic levelised Tariff for FY 2015-16, the CERC has also considered the Base Rate as 10%.

[<http://www.cercind.gov.in/2015/orders/SO4.pdf>]

Accordingly, the weighted average of SBI Base Rate for 1 April, 2014 to 31 March, 2015 as shown in the above Table, plus 300 basis points, works out to an interest rate of 13.00% p.a. (10.00% + 300 basis points), which has been considered as the normative interest rate on long-term loans for computation of levelised Tariff for RE technologies in this Order.

2.5. INTEREST ON WORKING CAPITAL

Regulation 18.3 of the Regulations provides for computation of the rate of Interest on Working Capital (IoWC) as under:

"Interest on Working Capital shall be the average of the Base Rate of State Bank of India prevalent during the previous year, plus 350 basis points."

Accordingly, the weighted average SBI Base Rate for FY 2014-15 as shown in the above Table, plus 350 basis points, works out to an interest rate of 13.50 % (10.00% + 350 basis points), which has been considered as the normative interest rate on Working Capital for computation of levelised Tariff for RE technologies in this Order.

2.6. LEVELISED TARIFF

Levelised Tariff is calculated by carrying out levelisation over the useful life of each technology considering the discount factor equivalent to the normative post-tax weighted average cost of capital, to represent the time value of money.

Discount Factor

The discount factor considered for this purpose is 10.75 %, which is equal to the normative post-tax weighted average cost of capital on the basis of normative debt-equity ratio of 70:30 specified in the Regulations, and weighted average rates for the debt and equity components.

Interest Rate considered for the loan component (i.e., 70%) of Capital Cost is 13.00% (as explained in para. 2.4 above). For the equity component (i.e., 30%), rate of Return on Equity (RoE) shall be computed at the base rate of 16%, grossed up as per the applicable tax rate. The rate of RoE is to be computed by grossing up the base rate with the tax rate equivalent to Minimum Alternate Tax (MAT) for the first 10 years from the Commercial Operation Date (COD), and the normal tax rate for the remaining years of Project life. Based on these rates and the debt-equity ratio, the weighted average RoE has been calculated, which is around 22.40% (ranging from 22% to 23% depending on the useful life of RE technologies). The discount factor for each technology derived by this method is detailed in the respective technology-specific Sections of this Order.

Note: The Discount Factor is computed as $10.75\% = ((13.00\% \times 0.70 \times (1 - 34.61\%)) + (16.00\% \times 0.30))$

2.7. GRANT, SUBSIDY OR INCENTIVE FROM THE CENTRAL/STATE GOVERNMENTS

Regulation 24 of the RE Tariff Regulations specifies that:

“The Commission shall take into consideration any grant, subsidy or incentive offered by the Central or State Government or their agencies, including accelerated/additional depreciation benefit, if availed, while determining the tariff under these Regulations:

Provided that the State Nodal Agency shall inform the Distribution Licensee regarding any such grant, subsidy or incentives received by a Project Entity on a quarterly basis;

Provided further that any such grant, subsidy or incentives availed by a Project Entity shall be deducted by the Distribution Licensee in subsequent bills raised by the particular Project Entity towards sale of electricity in suitable instalments or within such period as may be stipulated by the Commission;

Provided also that the following principles shall be considered for ascertaining the Income Tax benefit on account of accelerated or additional depreciation, if availed, for the purpose of tariff determination:

a. The assessment of benefit shall be based on normative Capital Cost, accelerated/additional depreciation rate as per the relevant provisions of the Income Tax Act and the Corporate Income Tax rate;

b. Capitalisation of RE Projects for the full financial year;

c. Per-unit benefit shall be derived on levelised basis at a discounting factor equivalent to the post-tax weighted average cost of capital;

Provided also that, in case the Central or State Government or their agencies provide any generation-based incentive which is specifically over and above the tariff, such incentive shall not be taken into account while determining the tariff.”

Accordingly, for Projects availing the benefit of accelerated depreciation as per the applicable Income Tax rate of 34.61% (30% Income Tax rate + 12% surcharge + 3% Education Cess) has been considered. For the purpose of determining the net depreciation benefits, depreciation @ 5.28% as per Straight Line Method (book depreciation as per Companies Act, 2013) has been compared with depreciation as per the Income Tax Act, i.e., 80% under Written Down Value method. Moreover, additional 20% depreciation in the initial year is proposed to be extended to new assets acquired by Power Generation Companies vide amendment to Section 32 (1) (ii a) of the Income Tax Act.

Depreciation for the first year has been calculated at the rate of 100% of 80%, and 100% of the additional depreciation of 20%, assuming the Project to be capitalized for full financial year as per the second proviso to Regulation 24. The tax benefit has been worked out as per the normal tax rate on the net depreciation benefit. The ‘per unit levelised accelerated depreciation benefit’ has been computed considering the weighted average cost of capital as discounting factor. The detailed computation of benefit of accelerated depreciation in respect of each RE technology has been covered under the technology-specific Sections.

Further, as per the second proviso to Regulation 24 of the RE Tariff Regulations, in case the Central or State Government or their agencies provide any generation-based incentive which is specifically over and above the Tariff, such incentive shall not be taken into account while determining the Tariff. Thus, while determining the Tariffs for RE Projects in this Order, no such incentives have been considered.

2.8. SHARING OF CDM BENEFITS

As per Regulation 22, all risks, costs and efforts associated with the availing of carbon credits shall be borne by the Project Entity. Further, the entire proceeds of carbon credit from an approved Clean Development Mechanism (CDM) Project, if any, shall be retained by it.

2.9. APPLICABILITY OF TARIFF ORDER

This Tariff Order shall be applicable for New RE Projects to be commissioned during the period from 10 November, 2015 (the date of notification of the RE Regulations, 2015) to 31 March, 2016 of FY 2015-16.

In case of Biomass-based Power Projects and Non-Fossil fuel-based Co-generation Power Projects commissioned on or before 10 November, 2015, the Variable Charge component of the Tariff for the remaining period of FY 2015-16 shall be determined as set out in the relevant provisions of this Order. The Fixed Charge component of the Tariff of such Projects shall continue to be governed by the relevant Orders of the Commission.

The applicable Tariff Rate, Tariff Structure and other terms and conditions for RE Projects commissioned on or before 31 March, 2015 will be in accordance with the relevant provisions of the Generic RE Tariff Order dated 7 July, 2014 for FY 2014-15 (Case No. 100 of 2014).

The following Sections of the Order outline the technology-wise norms and corresponding Generic Tariffs for New RE Projects to be commissioned from 10 November, 2015 to 31 March, 2016 based on various RE technologies.

3. WIND ENERGY PROJECTS

3.1. USEFUL LIFE

Regulation 2.1 (mm) of the RE Tariff Regulations defines 'useful life' in relation to a Unit of a Generating Station (including evacuation system) to mean the duration from the COD till such time as specified under the Regulations. Accordingly, the useful life for Wind Energy Projects as specified under Regulation 2.1 (mm) is 25 years from COD.

3.2. TARIFF PERIOD

Regulation 7 specifies the Tariff Period for various RE Projects. Accordingly, the Tariff Period for Wind Energy Projects is 13 years, considered from the COD of the Wind Project, and the Tariff determined under the Regulations shall be applicable only for the duration of the Tariff Period.

3.3. CAPACITY UTILISATION FACTOR

Under Regulation 28 of the RE Tariff Regulations, the norms for Capacity Utilization Factor (CUF) specified for Wind Energy Projects are as under:

<i>Wind Zone</i>	<i>Annual Mean Wind Power Density (W/m²)</i>	<i>CUF</i>
<i>Zone 1</i>	<i><=250</i>	<i>22%</i>
<i>Zone 2</i>	<i>>250 - <=300</i>	<i>25%</i>
<i>Zone 3</i>	<i>>300 - <=400</i>	<i>30%</i>
<i>Zone 4</i>	<i>>400</i>	<i>32%</i>

Provided that these CUF norms may be revised by the Commission through general or specific Order considering data that may become available subsequently.”

In accordance with Regulation 28.2, the annual mean wind power density is to be measured at 80 metre hub-height. As per Regulation 28.3, for the purpose of classification of a Wind Energy Project into a particular Wind Zone class, the State Nodal Agency, i.e., MEDA, shall refer to the State-wise wind power density map prepared by the National Institute for Wind Energy (NIWE).

3.4. CAPITAL COST

The Capital Cost for Wind Energy Projects shall include the cost of Wind Turbine Generator (WTG), including its auxiliaries, land cost, site development charges and other civil works, transportation charges, evacuation cost up to inter-connection point, financing charges and Interest during Construction (IDC), and capital investment relating to forecasting and scheduling. Accordingly, as specified in Regulation 26.2, the Commission considers the Capital Cost for Wind Energy Projects as Rs. 600.74 lakh/MW for the period from 10 November, 2015 to March, 2016 of this first year of the Review Period for the purpose of Tariff determination.

3.5. DEBT-EQUITY RATIO

Regulation 14.1 of the RE Tariff Regulations, 2015 provides that the debt-equity ratio of 70:30 is to be considered for determination of Generic Tariff. In accordance with the normative debt-equity ratio and the above Capital Cost, the debt and equity components for

Wind Energy Projects work out to Rs. 420.52 lakh per MW and Rs. 180.22 lakh per MW, respectively.

3.6. RETURN ON EQUITY

Regulation 17.2 stipulates the normative Return on Equity (RoE) as under:

“The Return on Equity shall be computed at the base rate of 16%, to be grossed up as per the applicable tax rate. The rate of Return on Equity shall be computed by grossing up the base rate with the tax rate equivalent to Minimum Alternate Tax (MAT) for the first 10 years from COD, and the normal tax rate for the remaining years of Project life.”

Accordingly, the RoE for the applicable period of this Order works out as under:

Opening Equity (Rs lakh / MW)	180.22
Return on Equity for first 10 years @16% grossing up with MAT rate of 21.34% (Rs lakh per MW)	36.66
Return on Equity after first 10 years @16% grossing up with Income Tax rate of 34.61% (Rs lakh per MW)	44.10

Note :- Grossing up of RoE is done as per the Formula: $RoE(\%) / [1 - Tax\ Rate(\%)]$

3.7. INTEREST ON LOAN

As explained in para. 2.4 of this Order, the interest rate of 13% (10.00% + 3%) has been considered for Wind Energy Projects for a loan amount of Rs. 420.52 lakh per MW.

3.8. DEPRECIATION

Regulation 16 specifies that depreciation is to be allowed up to a maximum of 90% of the Capital Cost of the asset. The depreciation rate for the first 12 years of the Tariff Period shall be 5.83% per annum, and the remaining depreciation shall be spread over the remaining useful life of the Project from the 13th year onwards.

Accordingly, for Wind Energy Projects, the depreciation rate is 5.83% for the first 12 years, and works out to 1.54% thereafter for the remaining useful life of 13 years.

3.9. INTEREST ON WORKING CAPITAL

Regulation 18.1 of the RE Tariff Regulations, 2015 provides for computation of the Working Capital requirements of Wind Energy Projects as under:

“(a) Operation & Maintenance expenses for one month;

(b) *Receivables equivalent to Two months of tariff for sale of electricity calculated on the normative CUF;*

(c) *Maintenance spares @ 15% of O & M expenses."*

Further, as explained earlier at para. 2.5, IoWC shall be computed at an interest rate equivalent to the average Base Rate of SBI during the previous year plus 350 basis points. para. 2.4 of this Order shows that the average Base Rate of SBI for FY 2014-15 is 10.00%. Accordingly, the rate of IoWC for Wind Energy Projects for the period of FY 2015-16 from 10 November, 2015 to 31 March, 2016 works out to 13.50% (10.00% + 350 basis points).

3.10. OPERATION AND MAINTENANCE EXPENSES

Regulation 29 of the RE Tariff Regulations specifies the normative O&M expenses for Wind Energy Projects for FY 2015-16 as 1.47 % of the Capital Cost. This is to be escalated at the rate specified in the Regulations of the Commission governing Multi Year Tariff over the Tariff Period, as per Regulation 29.2 of the RE Tariff Regulations, for determination of the levelised Tariff. Accordingly, the Commission has considered O&M expense norm for Wind Energy Projects as Rs 8.83 lakh per MW (1.47% of Rs 600.74 lakh/MW) for the applicable period of this Order.

3.11. LEVELISED TARIFF FOR NEW WIND ENERGY PROJECTS FROM 10 NOVEMBER, 2015 TO 31 MARCH, 2016

Accordingly, the Generic Tariffs for Wind Energy Projects in the period from 10 November, 2015 to 31 March, 2016 have been determined as follows. The discount factor for levelisation of Tariff for Wind Energy Projects works out to 10.75% as computed in para 2.6 of this Order.

Tariff for New Wind Energy Projects for the period from 10 November, 2015 to 31 March, 2016

Wind Energy	Tariff Period	Levelised Tariff from 10 November, 2015 to 31 March, 2016	Benefits of Tax and Additional Depreciation	Net Levelised Tariff, adjusting for Tax and Additional Depreciation Benefit
		Rs/kWh	(if availed)	(if availed)
			Rs/kWh	Rs/kWh
Wind Zone-1	13	5.71	0.61	5.10
Wind Zone-2	13	5.02	0.53	4.49
Wind Zone-3	13	4.19	0.44	3.75
Wind Zone-4	13	3.92	0.42	3.50

Notes:

- The above Tariff shall be valid for Projects commissioned during the period from 10 November, 2015 to 31 March, 2016.
- The above Tariff shall be valid for a Tariff Period of 13 years from the COD.
- Detailed computations of Tariffs for Wind Zones 1, 2, 3 and 4 are provided in Annexures 1A, 1B, 1C and 1D of this Order, respectively.

4. SMALL HYDRO POWER PROJECTS AND MINI/MICRO HYDRO PROJECTS

4.1. USEFUL LIFE

The useful life specified for Small Hydro Projects (SHPs) and Mini/Micro Hydro Projects under Regulation 2.1 (mm) of the RE Tariff Regulations is 35 years from COD.

4.2. TARIFF PERIOD

Regulation 7.2 of the Tariff Regulations specifies a Tariff Period of 13 years for SHPs of capacity higher than 5 MW and upto and including 25MW.

Regulation 7.3 specifies a Tariff Period of 35 years for Mini/Micro Hydro Projects and SHPs upto and including 5 MW. The Tariff Period matches the useful life in case of these Projects, reflecting a longer preferential treatment for them.

4.3. CAPITAL COST OF SMALL HYDRO PROJECTS

SHPs, for the purpose of the RE Tariff Regulations, are those Projects located at sites approved by the State Government/ State Nodal Agency using new plant and machinery and with installed power plant capacity lower than or equal to 25 MW. For specifying allowable Capital Cost, SHPs have been classified into two categories based on their installed capacities, viz., a) SHPs above 1 MW and upto and including 5 MW, and b) SHPs of capacities above 5 MW and lower than or equal to 25 MW.

Under Regulation 30.1 of the RE Tariff Regulations, the Commission considers the normative Capital Cost for SHPs during the applicable period of this Order as below:

Project Size	Capital Cost (Rs. lakh/MW)
> 1 MW and upto and including 5 MW	605.28
> 5 MW and upto and including 25 MW	550.70

4.4. DEBT-EQUITY RATIO

In accordance with Regulation 14.1, the debt and equity components for SHPs with capacities above 1 MW and up to and including 5 MW work out to Rs. 423.70 lakh per MW and Rs. 181.58 lakh per MW (i.e., 70% and 30% of the Capital Cost), respectively. For Projects having capacities above 5 MW and lower than or equal to 25 MW, the debt and equity components work out to Rs. 385.49 lakh per MW and Rs. 165.21 lakh per MW, respectively.

4.5. RETURN ON EQUITY

In accordance with Regulation 17.2 of the RE Tariff Regulations, the RoE works out as shown in the Table below:

Particulars	> 1 MW and up to and including 5 MW	> 5 MW and up to and including 25 MW
Opening Equity (in Rs lakh per MW)	181.58	165.21
Return on Equity for the first 10 years @ 16% grossing up with MAT rate of 21.34% (Rs lakh per MW)	36.94	33.61
Return on Equity after first 10 years @ 16% grossing up with Income Tax rate of 34.61% (Rs lakh per MW)	44.43	40.42

Note: - Grossing up of RoE is done as per the Formula: $RoE(\%) / [1 - Tax\ Rate(\%)]$

4.6. INTEREST ON LOAN

As explained in para. 2.4 of this Order, the interest rate of 13.00% (10.00% +300 basis points) has been considered for SHPs with capacities above 1 MW and up to and including 5 MW, with a gross opening loan amount of Rs. 423.70 lakh per MW; and for SHPs with capacities above 5 MW and lower than or equal to 25 MW, with a gross opening loan amount of Rs. 385.49 lakh per MW in the applicable period of this Order.

4.7. DEPRECIATION

In accordance with Regulation 16.2, the depreciation will be charged at 5.83% for the first 12 years and at 0.87% thereafter for the remaining useful period of 23 years for SHPs.

4.8. INTEREST ON WORKING CAPITAL

Regulation 18.1 of the RE Tariff Regulations provides for computation of the working capital requirements of SHPs as under:

"(a) O & M expenses for one month;

(b) Receivables equivalent to two months of tariff for sale of electricity calculated on the normative CUF;

(c) Maintenance spares @ 15% of O & M expenses."

Further, as explained in para. 2.5 of this Order, IoWC shall be computed at an interest rate equivalent to the average Base Rate of SBI during the previous year plus 350 basis points, i.e., 13.50% (10.00% + 350 basis points).

4.9. OPERATION AND MAINTENANCE EXPENSES

Regulation 34.1 provides for the normative O&M expenses for SHPs for FY 2015-16 to be escalated at the rate specified in the Commission's Regulations governing Multi Year Tariff over the Tariff Period, as per Regulation 34.2 of the RE Tariff Regulations, for determination of the levelised Tariff. Accordingly, the following normative O&M expenses have been considered by the Commission for SHPs for the applicable period of this Order:

Project Size	O&M Expenses (Rs lakh/MW)
> 1 MW and upto and including 5 MW	3.60% of the Capital Cost
> 5 MW and upto and including 25 MW	2.80% of the Capital Cost.

4.10. CAPACITY UTILISATION FACTOR

In accordance with Regulation 32 of the RE Tariff Regulations, a CUF of 30% has been considered for determination of Tariff for SHPs.

4.11. AUXILIARY POWER CONSUMPTION

In accordance with Regulation 33, a Normative Auxiliary Consumption of 1.0% has been considered for determination of Tariff of SHPs.

4.12. INCENTIVE FOR MINI/MICRO HYDRO PROJECTS

The RE Tariff Regulations provide for a Tariff for Mini/Micro hydro Projects which is higher than for other SHP Projects, as below:

"35.1 The tariff for Mini Hydro Power Projects of capacity of 1 MW and less but
RE Tariff Order (Suo-Moto) for FY 2015-16 (10 November, 2015 to 31 March, 2016)

more than 500 kW, shall be higher by Rs 0.50 per kWh than that applicable to Small Hydro Power Projects with installed capacity of 5 MW or less, but more than 1 MW.

35.2 The tariff for Micro Hydro Power Projects of a capacity of 500 kW and below shall be higher by Rs. 1.00 per kWh than that tariff applicable to Small Hydro Power Projects with installed capacity of 5 MW or less but more than 1 MW.”

In accordance with these principles, the Commission has allowed a higher Tariff for Mini/Micro Hydro Projects over other SHPs.

4.13. LEVELISED TARIFF FOR NEW SMALL HYDRO PROJECTS FROM 10 NOVEMBER, 2015 TO 31 MARCH, 2016

Considering the above parameters and the discount factor worked out as 10.75% (as computed at para. 2.6 of this Order) for levelisation of Tariff for SHP, the Generic Tariffs for SHPs during the applicable period of this Order have been determined as under:

Tariff for New RE Projects – Mini/Micro Hydro Projects and other SHPs

Type of SHP	Tariff Period	Levelised Tariff from 10 November, 2015 to 31 March, 2016	Benefit of Accelerated Depreciation (if availed)	Net Levelised Tariff (upon adjusting for accelerated depreciation benefit, if availed)
		(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Mini and Micro Hydro Projects				
500 kW and below	35	6.12	0.43	5.69
Above 500 kW and up to and including 1 MW	35	5.62	0.43	5.19
Other SHPs				
Above 1 MW and up to and including 5 MW	35	5.12	0.43	4.69
Above 5 MW and upto and including 25 MW	13	4.35	0.39	3.96

Notes:

- The above Tariffs shall be valid for Projects commissioned during the period from 10 November, 2015 to 31 March, 2016.
- The above Tariffs shall be valid for a Tariff Period of 35 years from COD for SHPs less than and including 5 MW, and for 13 years for SHPs with installed capacity greater than 5 MW and up to and including 25 MW

- Detailed computations of Tariffs for SHP (1 MW to 5 MW) and SHP (5 MW to 25 MW) are provided in Annexures 2A and 2B of this Order, respectively.

5. BIOMASS-BASED POWER PROJECTS

5.1. KEY PROVISIONS OF RE TARIFF REGULATIONS

Chapter 5 of the RE Tariff Regulations provides technology-specific norms for determination of Tariff for Biomass-based Power Projects based on Rankine Cycle technology applications using water-cooled condensers, as below:

"37.1 The Capital Cost and performance norms as specified in this Chapter shall be applicable only to new Biomass-based Power Projects commissioned after notification of these Regulations.

37.2 The fuel-related aspects specified in Regulations 44 to 50 shall be applicable to both existing and new Biomass-based Power Projects;

Provided that the norms in respect of SHR and Auxiliary Consumption factor for existing Biomass-based Power Projects shall be as stipulated in the respective RE Tariff Orders referred to in Regulation 3.2."

Accordingly, Regulation 49 of the RE Tariff Regulations specifies biomass fuel price as Rs. 3987 /MT during the first year of Review Period, i.e., FY 2015-16, which are thereafter linked to the indexation mechanism specified in Regulation 50. Regulation 50.1 reads as follows:

"50.1 In the case of both existing and new Biomass-based Power Projects, the following indexing mechanism for adjustment of fuel prices for each year of operation will be applicable for determination of the variable charge component of tariff:

The Variable Charge for the nth year shall be computed as under:

$$VC_n = VC_1 \times (P_n / P_1)$$

where,

VC₁ represents the Variable Charge based on Biomass Price P₁ for FY 2015-16 as specified under Regulation 49, and shall be determined as under:

P_(n) = Price per tonne of biomass for the nth year to be considered for tariff determination

P_(n-1) = Price per tonne of biomass for the (n-1)th year to be considered for tariff determination. P₁ shall be the Biomass price for FY 2015-16 as specified under

Regulation 49.”

Accordingly, in case of Biomass-based Power Projects commissioned prior to 10 November, 2015, the Variable Charge component of the Tariff for FY 2015-16 shall be determined as outlined under para 5.14 of this Order. The Fixed Charge component of the Tariff shall continue to be governed by the relevant Orders of the Commission.

5.2. CAPITAL COST OF BIOMASS-BASED POWER PROJECTS

Regulation 38 specifies the normative Capital Cost for the Biomass-based Power Projects based on Rankine Cycle technology as Rs. 494.32 lakh per MW for FY 2015-16.

5.3. DEBT-EQUITY RATIO

In accordance with Regulation 14.1, the debt and equity components for Biomass-based Power Projects to be commissioned during the applicable period of this Order work out to Rs. 346.02 lakh per MW and Rs. 148.30 lakh per MW respectively.

5.4. RETURN ON EQUITY

In accordance with Regulation 17.2 of the RE Tariff Regulations, the RoE works out as shown in the Table below:

Particulars	Biomass-based Projects
Opening Equity (in Rs lakh per MW)	148.30
Return on Equity for the first 10 years @16% grossing up with MAT rate of 21.34% (Rs lakh per MW)	30.17
Return on Equity after first 10 years @16% grossing up with Income Tax rate of 34.61% (Rs lakh per MW)	36.28

Note: - Grossing up of RoE is done as per the Formula: $RoE(\%) / [1 - Tax\ Rate(\%)]$

5.5. INTEREST ON LOAN

As explained in para. 2.4 of this Order, the interest rate of 13.00% (10.00% + 300 basis points) has been considered for Biomass-based Power Projects commissioned in the applicable period of this Order, with a gross opening loan amount of Rs. 346.02 lakh per MW.

5.6. DEPRECIATION

In accordance with Regulation 16.2, depreciation will be charged at 5.83% for the first 12 years, and at 2.50% thereafter for the remaining useful life of 8 years.

5.7. INTEREST ON WORKING CAPITAL

Regulation 18.2 of the RE Tariff Regulations provides for computation of the working capital requirements of the Biomass-based Power Projects as under:

"(a) Fuel costs for four months equivalent to normative Plant Load Factor(PLF);

(b) O & M expenses for one month;

(c) Receivables equivalent to two months of fixed and variable charges for sale of electricity calculated on the target PLF;

(d) Maintenance spares @ 15% of O & M expenses"

Further, as explained above in para. 2.5, IoWC shall be computed at an interest rate equivalent to the average Base Rate of SBI during the previous year plus 350 basis points, i.e., 13.50% (10.00% + 350 basis points).

5.8. PLANT LOAD FACTOR

In accordance with Regulation 40.1 of the RE Tariff Regulations, the Plant Load Factor (PLF) for determining the Fixed Charge component of the Tariff for Biomass-based Power Projects will be as follows:

- a) During stabilisation: 60%
- b) During the remaining period of the first year (after stabilisation): 70%
- c) From 2nd Year onwards: 80%.

5.9. AUXILIARY POWER CONSUMPTION

In accordance with Regulation 41, a Normative Auxiliary Consumption of 10.0% has been considered for determination of Tariff of Biomass-based Power Projects.

5.10. STATION HEAT RATE

In accordance with Regulation 42 of the RE Tariff Regulations, the Normative SHR of 4200 kcal/kWh has been considered for determination of Tariff.

5.11. OPERATION AND MAINTENANCE EXPENSES

Regulation 43.1 of the RE Tariff Regulations specifies the normative O&M expenses for Biomass-based Power Projects for FY 2015-16 as 5.32% of the Capital Cost for Tariff determination. This works out to Rs. 26.30 lakh per MW, which is to be escalated at the rate specified in the Regulations of the Commission governing Multi Year Tariff over the Tariff Period, as per Regulation 43.2 of the RE Tariff Regulations, 2015.

5.12. CALORIFIC VALUE

In accordance with Regulation 48, the average Calorific Value of the Biomass Fuel (s) of 3611 kcal/kg has been considered for determination of Tariff.

5.13. FUEL COST

Regulation 49 specifies the Biomass fuel price during the first year of the Review Period, i.e., FY 2015-16, as Rs. 3987/MT, which shall be linked to the indexation mechanism specified under Regulation 50. Thus, the Fuel Cost for Biomass-based Power Projects to be commissioned during the period from 10 November, 2015 to 31 March, 2016 is considered as Rs 3987 per MT. Considering this Fuel Cost, the Commission has computed Variable Charge as Rs. 5.15/kWh for Biomass-based Power Projects to be commissioned during the period from 10 November, 2015 to 31 March, 2016 in accordance with Regulation 50.1 of RE Tariff Regulations, considering Gross Calorific Value (GCV) of 3611 kcal/kg, SHR as 4200 Kcal/kWh and Auxiliary Consumption as 10%.

5.14. VARIABLE CHARGE FOR BIOMASS-BASED POWER PROJECTS COMMISSIONED PRIOR TO 10 NOVEMBER, 2015

As per Regulation 37.2 of the RE Tariff Regulations, 2015, the fuel-related aspects specified in Regulations 44 to 50 shall be applicable to both existing and new Biomass-based Power Projects except for the SHR and Auxiliary Consumption norms which shall be as stipulated in the respective RE Tariff Orders referred to in Regulation 3.2. Accordingly, the norms in respect to Fuel Price and GCV shall be applicable to existing projects as per Regulation 40, 50 and 59. Further, as detailed in para. 1.18 of this Order, the SHR for existing projects has been taken as 4200 kcal/kWh. The Auxiliary Consumption Factor for existing Projects commissioned prior to 10 November, 2015 shall be as stipulated in the respective Tariff Orders(i.e., 10%). Based on these parameters, the variable cost of the Projects commissioned prior to 10 November, 2015 works out to Rs 5.15/kWh.

The Fixed Charge component of the Tariff for Biomass-based Power Projects commissioned prior to 10 November, 2015, shall be the levelised Fixed Charge approved under respective RE Tariff Orders.

5.15. LEVELISED TARIFF FOR BIOMASS BASED POWER PROJECTS FROM 10 NOVEMBER, 2015 TO 31 MARCH, 2016

Considering the above parameters and the discount factor worked out as 10.75% (as computed at para 2.6 of this Order) for levelisation of Tariff, the Generic Tariffs for Biomass-based Power Projects for the applicable period of this order have been determined in the Table below.

Date of Commissioning of Project	Fixed Charge (Rs/kWh)	Variable Charge (Rs/kWh)	Tariff during 10 November, 2015 to 31 March, 2016 (Rs/kWh)	Benefit of Accelerated Depreciation (if availed) (Rs/kWh)	Net Levelised Tariff (upon adjusting for accelerated depreciation benefit, if availed) (Rs/kWh)
During FY 2015-16 (10 November, 2015 to 31 March, 2016)	2.35	5.15	7.50	0.16	7.34
During FY 2015-16 (1 April to 9 November, 2015)	2.27*	5.15	7.42	0.22*	7.20
During FY 2014-15	2.27*	5.15	7.42	0.22*	7.20
During FY 2013-14	2.17#	5.15	7.32	0.21#	7.11
Prior to FY 2013-14	1.70**	5.15	6.85	NA	6.85

* As per Order dt 7 July, 2014 in Case No. 100 of 2014(extended till 31 Dec 2015)

As per Order dt 22 March, 2013 in Case No. 6 of 2013

**Considering first year of operation as per Order dt 8 August, 2005 in Case Nos. 37 of 2003 and 83 of 2008)

Note :- Detailed computations of Tariff for the period in FY 2015-16 from 10 November, 2015 to 31 March, 2016 for Biomass based Power Projects are provided in Annexure 3 of this Order.

The Tariff Rate comprises two parts, viz., (i) Fixed Charge component, and (ii) Variable Charge component, and shall be applicable for sale of power by Rankine Cycle-based Projects to Distribution Licensees in Maharashtra during the applicable period of this Order.

6. NON-FOSSIL FUEL-BASED CO-GENERATION PROJECTS

6.1. KEY PROVISIONS OF RE TARIFF REGULATIONS

Chapter 6 of the RE Tariff Regulations provides technology-specific norms for determination of Tariff for Non-fossil fuel-based Co-Generation Projects. Regulations 50.1 and 50.2 read as follows:

"52.1 The Capital Cost and performance norms specified in this Chapter shall be applicable only to Non-Fossil Fuel-based Co-Generation Projects commissioned after notification of these Regulations.

52.2 The fuel-related aspects specified under Regulations 59 to 66 shall be applicable to both existing and new Non-Fossil Fuel-based Co-Generation Projects:

Provided that the norms in respect of specific fuel consumption and Auxiliary Consumption factor for existing Non-Fossil Fuel-based Co-Generation Projects shall be as stipulated in the respective RE Tariff Orders referred to in Regulation 3.2."

The Regulations also specify that the fuel price for each year of operation, in respect of both existing and new Non-fossil fuel-based Co-Generation Projects, shall be adjusted based on an indexation mechanism:

"61.1 In the case of both existing and new non-fossil fuel-based Co-Generation Projects, the following indexing mechanism for adjustment of fuel prices for each year of operation will be applicable for determination of the variable charge component of tariff:

The Variable Charge for the nth year shall be computed as under:

$$VC_n = VC_1 \times (P_n / P_1)$$

where,

VC₁ represents the Variable Charge based on Bagasse Price P₁ for FY 2015-16 as specified under Regulation 60, and shall be determined as under:

P_(n) = Price per tonne of Bagasse for the nth year to be considered for tariff determination

P_(n-1) = Price per tonne of Bagasse for the (n-1)th year to be considered for tariff determination. P₁ shall be the Bagasse price for FY 2015-16 as specified under Regulation 60.

The Bagasse fuel price shall be revised by the Commission taking into consideration

the Bagasse fuel price determined by the Central Commission for each year.”

Accordingly, in case of Non-fossil fuel-based Co-generation Power Projects commissioned on or prior to 31 March, 2014, the Variable Charge component of the Tariff for the period of FY 2015-16 from 10 November, 2015 to 31 March, 2016 shall be determined as per para 6.15 of this Order. The Fixed Charge component shall continue to be governed by the relevant Orders issued by the Commission.

6.2. CAPITAL COST OF NON-FOSSIL FUEL-BASED CO-GENERATION PROJECTS

The normative Capital Cost for Non-fossil fuel-based Co-Generation Projects for the first year of the Review Period has been specified by the Commission under Regulation 53 of RE Tariff Regulations. Hence, the normative Capital Cost for the period of FY 2015-16 from 10 November, 2015 to 31 March, 2016 is considered as Rs. 489.02 lakh per MW.

6.3. DEBT-EQUITY RATIO

In accordance with Regulation 14.1, the debt and equity components for the remaining applicable period of this Order work out to Rs. 342.31 lakh per MW and Rs. 146.71 lakh per MW, respectively.

6.4. RETURN ON EQUITY

In accordance with Regulation 17, the RoE works out as shown in the Table below:

Particulars	Non-fossil fuel-based Co-generation Project
Opening Equity (in Rs lakh per MW)	146.71
Return on Equity for the first 10 years @16% grossing up with MAT rate of 21.34% (Rs lakh per MW)	29.84
Return on Equity after first 10 years @16% grossing up with Income Tax rate of 34.61% (Rs lakh per MW)	35.90

Note: - Grossing up of RoE is done as per the Formula: $RoE(\%) / [1 - Tax Rate(\%)]$

6.5. INTEREST ON LOAN

As explained in para. 2.4 of this Order, an interest rate of 13.00% (10.00% +300 basis points) has been considered, with a gross opening loan amount of Rs. 342.31 lakh per MW in FY 2015-16.

6.6. DEPRECIATION

In accordance with Regulation 16 of the RE Tariff Regulations, the depreciation will be charged at 5.83% for the first 12 years, and at 2.50% thereafter for the remaining useful life of 8 years.

6.7. INTEREST ON WORKING CAPITAL

Regulation 18 of the RE Tariff Regulations provides for computation of the working capital requirements of Non-fossil fuel-based Co-Generation Projects as under:

“

- a) *Fuel costs for four months equivalent to normative Plant Load Factor ('PLF');*
- b) *O&M expenses for one month;*
- c) *Receivables equivalent to two months of fixed and variable charges for sale of electricity calculated on the target PLF;*
- d) *Maintenance spares @ 15% of O&M expenses.”*

Further, as explained above in para. 2.5, IoWC shall be computed at an interest rate equivalent to the average Base Rate of SBI during the previous year plus 350 basis points, i.e., 13.50% (10.00% + 350 basis points).

6.8. OPERATION AND MAINTENANCE EXPENSES

Regulation 58.1 of the RE Tariff Regulations specifies the normative O&M expenses for Non-Fossil fuel-based Co-Generation Projects for FY 2015-16 as 3.54% of the Capital Cost, which is to be escalated at the rate specified in the Commission's Regulations governing Multi Year Tariff over the Tariff Period, as per Regulation 58.2 of the RE Tariff Regulations, for determination of the levelised Tariff. Accordingly, the O & M expenses for such Projects for the period in FY 2015-16 from 10 November, 2015 to 31 March, 2016 has been considered as Rs. 17.31 lakh per MW.

6.9. PLANT LOAD FACTOR

In accordance with Regulation 55.2, PLF of 60% has been considered for determination of Tariff for Non-Fossil fuel-based Co-Generation Projects.

6.10. AUXILIARY POWER CONSUMPTION

In accordance with Regulation 56, the Auxiliary Consumption of 8.5% has been considered for determination of Tariff.

6.11. STATION HEAT RATE

In accordance with Regulation 57, the Normative SHR of 3600 kcal/kWh has been considered for determination of Tariff.

6.12. CALORIFIC VALUE

In accordance with Regulation 59, the average Calorific Value of Bagasse fuel is considered as 2250 kcal/kg for determination of Tariff of such Projects.

6.13. FUEL COST

Regulation 60.1 specifies the Bagasse fuel price during the first year of the Review Period, i.e., FY 2015-16, as Rs. 2326.84/MT, which is linked to the indexation mechanism specified under Regulation 61. Accordingly, the Commission considers the Fuel Cost for Non-Fossil fuel-based Co-Generation Projects to be commissioned in the period of FY 2015-16 from 10 November, 2015 to 31 March, 2016 as Rs. 2326.84/MT. Considering this Fuel Cost, the Commission has computed Variable Charge as Rs. 4.07/kWh for Projects to be commissioned during this period, in accordance with Regulation 61.1 of the RE Tariff Regulations, considering GCV as 2250 kcal/kg, SHR as 3600 Kcal/kWh and Auxiliary Consumption as 8.5%.

6.14. VARIABLE CHARGE FOR BAGASSE-BASED CO-GENERATION POWER PROJECTS COMMISSIONED PRIOR TO 10 NOVEMBER, 2015

In its Order dated 7 July, 2014 in Case No. 100 of 2014, the Commission had determined the Variable Charge for Bagasse-based Co-Generation Projects for FY 2014-15 as Rs. 3.81 per kWh based on Bagasse fuel price of Rs 2177/MT. Considering the Bagasse fuel price of Rs. 2326.84/MT during FY 2015-16 as outlined in earlier paras., the Commission has revised the Variable Charge of Projects commissioned prior to FY 2013-14, during FY 2013-14, FY 2014-15 and in FY 2015-16 prior to 10 November, 2015, to Rs. 4.07 per kWh (i.e., Rs. 3.81/kWh x Rs 2326.84 per MT/ Rs 2177 per MT) for the period from 10 November, 2015 to 31 March, 2016.

6.15. LEVELISED TARIFF FOR NON-FOSSIL FUEL-BASED CO-GENERATION PROJECTS FROM 10 NOVEMBER, 2015 TO 31 MARCH, 2016

Considering the above parameters and the discount factor as 10.75% (as computed at para 2.6 of this Order) for levelisation of Tariff of Non-Fossil fuel-based Co-Generation Projects commissioned in the period of FY 2015-16 from 10 November, 2015 to 31 March, 2016, the Generic Tariffs for such Projects for FY 2015-16 have been determined as under:

**TARIFF FOR NON-FOSSIL FUEL-BASED CO-GENERATION PROJECTS FROM
10 NOVEMBER, 2015 TO 31 MARCH, 2016**

Date of Commissioning	Fixed Charge (Rs/kWh)	Variable Charge (Rs/kWh)	Tariff (Rs/kWh)	Benefit of Accelerated Depreciation (if availed) (Rs/kWh)	Net Levelised Tariff (upon adjusting for accelerated depreciation benefit, if availed) (Rs/kWh)
During FY 2015-16 (10 November, 2015 to 31 March, 2016)	2.52	4.07	6.59	0.21	6.38
During FY 2015-16 (1 April to 9 November, 2015)	2.46*	4.07	6.53	0.28*	6.25
During FY 2014-15	2.46*	4.07	6.53	0.28*	6.25
During FY 2013-14	2.38#	4.07	6.45	0.27#	6.18
Prior to FY 2013-14	2.26**	4.07	6.33	NA	6.33

* As per Order dt 7 July, 2014 in Case No. 100 of 2014 (extended till 31 Dec 2015)

#As per Order dt 22 March, 2013 in Case No. 6 of 2013

** As per Order dt 11 January, 2010 in Case No. 123 of 2008

Note :- Detailed computations of Tariff for the remaining Tariff Review Period of FY 2015-16 (10 November, 2015 to 31 March, 2016) for Non-fossil fuel-based Co-generation Projects are provided in Annexure 4 of this Order.

The Fixed Charge component of the Tariff for Bagasse-based Co-Generation Power Projects commissioned prior to FY 2013-14, and in FY 2013-14, FY 2014-15 and in FY 2015-16 prior to 10 November, 2015, shall be the levelised Fixed Charge approved under the respective RE Tariff Orders.

The Tariff Rate comprises two parts, viz., (i) Fixed Charge component, and (ii) Variable Charge component, and shall be applicable for sale of power by Non-Fossil fuel-based Co-Generation Projects to Distribution Licensees in Maharashtra from 10 November, 2015 to 31 March, 2016.

6.16. TARIFF FOR NON-QUALIFYING NON-FOSSIL FUEL-BASED CO-GENERATION PLANTS

The Tariff of Non-Qualifying Non-Fossil fuel-based Co-Generation (NQNFFC) Projects will be equivalent to the Average Power Purchase Cost (APPC) of the respective Distribution Licensees for the period of FY 2015-16 from 10 November, 2015 to 31 March, 2016 in accordance with the provisions of Regulations 67 of the RE Tariff Regulations, 2015.

7. SOLAR PHOTO VOLTAIC PROJECTS

7.1. USEFUL LIFE

Regulation 2.1 (mm) of the RE Tariff Regulations defines 'useful life' in relation to a Unit of a Generating Station (including evacuation system) to mean the duration from the COD till such time as specified under the RE Tariff Regulations for such generation facility. Accordingly, the useful life specified for Solar Photo Voltaic (PV) Projects is 25 years.

7.2. CONTROL PERIOD

The Control Period for Solar PV Projects shall be in accordance with the relevant stipulations at para 2.1 of this Order.

7.3. TARIFF PERIOD

Regulation 7 of the RE Tariff Regulations specifies the Tariff Period for Solar PV Projects as 13 years. In terms of Regulation 7.5, the Tariff Period specified shall be reckoned from the COD of the RE Projects and the Tariff determined under the Regulations shall be applicable only for the duration of the Tariff Period.

7.4. CAPITAL COST OF SOLAR PV PROJECTS

Regulation 69 of the RE Tariff Regulations specifies the normative Capital Cost of a Solar PV Power Project for FY 2015-16 as Rs. 605.85 Lakh/MW. The Commission proposes to consider the same for the Projects to be commissioned in the period from 10 November, 2015 to 31 March, 2016.

7.5. DEBT-EQUITY RATIO

In accordance with Regulation 14.1, the normative debt and equity components for Solar PV Projects shall be Rs. 424.10 Lakh per MW and Rs. 181.76 Lakh per MW, respectively.

7.6. RETURN ON EQUITY

In accordance with Regulation 17.1, the RoE for Solar PV Projects works out as shown in the Table below:

Particulars	Solar PV Projects
Opening Equity (in Rs lakh per MW)	181.76
Return on Equity for the first 10 years @16% grossing up with MAT rate of 21.34% (Rs lakh per MW)	36.97
Return on Equity after first 10 years @16% grossing up with Income Tax rate of 34.61% (Rs lakh per MW)	44.47

Note: - Grossing up of RoE is done as per the Formula: $RoE(\%) / [1 - Tax\ Rate(\%)]$

7.7. INTEREST ON LOAN

As explained in Para. 2.4 of this Order, the interest rate of 13.00% (10.00% + 300 basis points) has been considered for Solar PV Projects for a loan amount of Rs. 424.10 lakh per MW in the period of FY 2015-16 from 10 November, 2015 to 31 March, 2016.

7.8. DEPRECIATION

In accordance with Regulation 16, the depreciation will be charged at 5.83% for the first 12 years, and at 1.54% thereafter for the remaining useful period of 13 years for Solar PV Projects.

7.9. INTEREST ON WORKING CAPITAL

Regulation 18.1 provides for computation of the working capital requirements for Solar PV Projects as under:

“

- a) *O&M expenses for one month;*
- b) *Receivables equivalent to two months of tariff for sale of electricity calculated on the normative CUF;*
- c) *Maintenance spares @ 15% of O&M expenses.”*

Further, as explained above in Para. 2.5 of this Order, IoWC shall be computed at an interest rate equivalent to the average Base Rate of SBI during the previous year plus 350 basis points, i.e., 13.50% (10.00% + 350 basis points).

7.10. OPERATION AND MAINTENANCE EXPENSES

Regulation 71.1 specifies the normative O&M expenses for Solar PV Projects for FY 2015-16 as Rs. 13 lakh per MW, to be escalated at the rate specified in the Commission's Regulations governing Multi Year Tariff over the Tariff Period, as per Regulation 71.2 of the RE Tariff Regulations, for determination of the levelised Tariff. Accordingly, the O&M expenses norm for Solar PV Projects for the period from 10 November, 2015 to 31 March, 2016 of FY 2015-16 has been considered as Rs. 13.00 lakh per MW.

7.11. CAPACITY UTILISATION FACTOR

In accordance with Regulation 70, CUF of 19% has been considered for determination of Tariff.

7.12. LEVELISED TARIFF FOR SOLAR PV POWER PROJECTS COMMISSIONED BETWEEN 10 NOVEMBER, 2015 TO 31 MARCH, 2016

Considering the parameters discussed in the preceding paras. and with respect to the discount factor of 10.75% derived based on the methodology in para. 2.6 of this Order, the Generic Tariffs for Solar PV Projects commissioned during the period from 10 November, 2015 to 31 March, 2016 have been determined as under:

Tariff for New Solar PV Power Projects				
Particulars	Tariff Period	Levelised Tariff	Benefit of Accelerated Depreciation (if availed)	Net Levelised Tariff (upon adjusting for Accelerated Depreciation benefit, if availed)
		(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Solar PV Projects	13	7.08	0.71	6.37

Note :- Detailed computations of Tariff for the remaining Tariff Review Period of FY 2015-16 (10 November, 2015 to 31 March, 2016) for new Solar Power PV Projects are provided in Annexure 5A of this Order.

7.13. LEVELISED TARIFF FOR SOLAR ROOF-TOP PV PROJECTS FROM 10 NOVEMBER, 2015 TO 31 MARCH, 2016

Solar Roof-top PV Projects considered in this Order under the RE Tariff Regulations, 2015 are distinct and separate from those covered under the MERC (Net Metering for Roof-top Solar Photo Voltaic Systems) Regulations, 2015.

Regulation 72 of the RE Tariff Regulations specifies that the Tariff for Solar Roof-top PV Projects shall be Rs 0.50 per kWh higher than the Tariff specified for other Solar PV Projects in the Regulations. Accordingly, the Tariff for such Projects during the period from 10 November, 2015 to 31 March, 2016 shall be as follows:

Tariff for New Solar Roof-top PV Power Projects

Particulars	Tariff Period	Levelised Total Tariff	Benefit of Accelerated Depreciation (if availed)	Net Levelised Tariff (upon adjusting for Accelerated Depreciation benefit, if availed)
		(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Solar Roof-top PV and other small Solar Power Projects	13	7.58	0.71	6.87

8. SOLAR THERMAL POWER PROJECTS

8.1. USEFUL LIFE

Regulation 2.1 (mm) of the RE Tariff Regulations defines 'useful life' in relation to a Unit of a Generating Station (including evacuation system) to mean the duration from the COD till such time as specified under the RE Tariff Regulations for such generation facility. Accordingly, the useful life specified for Solar Thermal Power Projects is 25 years.

8.2. CONTROL PERIOD

The Control Period for Solar Thermal Power Projects shall be in accordance with the relevant stipulations in para 2.1 of this Order.

8.3. TARIFF PERIOD

Regulation 7 specifies the Tariff Period for Solar PV Projects as 25 years. In terms of Regulation 7.5, the Tariff Period specified shall be reckoned from the COD of the RE

Projects, and the Tariff determined under the Regulations shall be applicable only for the duration of the Tariff Period.

8.4. CAPITAL COST OF SOLAR THERMAL POWER PROJECTS

Regulation 74 of the RE Tariff Regulations specifies the normative Capital Cost of a Solar Thermal Power Project for FY 2015-16 as Rs. 1200 lakh/MW. The Commission has considered this normative Capital Cost for Projects to be commissioned in the period of FY 2015-16 from 10 November, 2015 to 31 March, 2016.

8.5. DEBT-EQUITY RATIO

In accordance with Regulation 14.1, the normative debt and equity components for Solar Thermal Projects shall be Rs. 840 Lakh per MW and Rs. 360 Lakh per MW, respectively.

8.6. RETURN ON EQUITY

In accordance with Regulation 17.1, the RoE for such Projects works out as shown in the Table below:

Particulars	Solar Thermal Projects
Opening Equity (in Rs lakh per MW)	360.00
Return on Equity for the first 10 years @16% grossing up with MAT rate of 21.34% (Rs lakh per MW)	73.23
Return on Equity after first 10 years @16% grossing up with Income Tax rate of 34.61% (Rs lakh per MW)	88.08

Note :- Grossing up of RoE is done as per the Formula: $RoE (\%) / [1 - Tax Rate(\%)]$

8.7. INTEREST ON LOAN

As explained in para. 2.4 of this Order, the interest rate of 13.00% (10.00% + 300 basis points) has been considered for Solar Thermal Power Projects for a loan amount of Rs. 840.00 lakh per MW for the period of FY 2015-16 from 10 November, 2015 to 31 March, 2016.

8.8. DEPRECIATION

In accordance with Regulation 16, the Depreciation will be charged at 5.83% for the first 12 years, and at 1.54% thereafter for the remaining useful period of 13 years.

8.9. INTEREST ON WORKING CAPITAL

Regulation 18.1 provides for computation of the working capital requirements for Solar Thermal Power Projects as under:

“

- d) *O&M expenses for one month;*
- e) *Receivables equivalent to two months of tariff for sale of electricity calculated on the normative CUF;*
- f) *Maintenance spares @ 15% of O&M expenses.”*

Further, as explained above in para. 2.5, IoWC shall be computed at an interest rate equivalent to the average Base Rate of SBI during the previous year plus 350 basis points, i.e., 13.50% (10.00% + 350 basis points).

8.10. OPERATION AND MAINTENANCE EXPENSES

Regulation 76.1 specifies the normative O&M expenses for Solar Thermal Power Projects for FY 2015-16 as Rs. 15 Lakh per MW, to be escalated at the rate specified in the Commission's Regulations governing Multi Year Tariff over the Tariff Period as per Regulation 76.2 of the RE Tariff Regulations, for determination of the levelised Tariff. Accordingly, the O&M expenses norm for Solar Thermal Power Projects for the remaining applicable period of this Order has been considered as Rs. 15.00 lakh per MW.

8.11. CAPACITY UTILISATION FACTOR

In accordance with Regulation 75, CUF of 23% has been considered for determination of Tariff for such Projects.

8.12. LEVELISED TARIFF FOR SOLAR THERMAL POWER PROJECTS COMMISSIONED BETWEEN 10 NOVEMBER, 2015 AND 31 MARCH, 2016

Considering the parameters discussed in the preceding paras. and with respect to the discount factor of 10.75% derived based on the methodology in para. 2.6 of this Order, the Generic Tariff for Solar Thermal Power Projects commissioned in FY 2015-16 between 10 November, 2015 and 31 March, 2016 has been determined as under:

Tariff for New Solar Thermal Power Projects				
Particulars	Tariff Period (Years)	Levelised Tariff	Benefit of Accelerated Depreciation (if availed)	Net Levelised Tariff (upon adjusting for Accelerated Depreciation benefit, if availed)
		(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Solar Thermal Power Projects	25	12.05	1.40	10.64

Note :- Detailed computations of Tariff for the period from 10 November, 2015 to 31 March, 2016 for new Solar Power PV Projects are provided in Annexure 5B of this Order.

9. The detailed computations of the Generic Tariff for various RE technologies are set out in the following Annexures to this Order:

S No	Renewable Energy Projects	Annexure
1	Wind Power Projects	
	Wind Zone-I	Annexure 1A
	Wind Zone-II	Annexure 1B
	Wind Zone III	Annexure 1C
	Wind Zone IV	Annexure 1D
2	Small Hydro Power Projects	
	SHP above 1MW and upto and including 5 MW	Annexure 2A
	SHP above 5 MW and upto and including 25 MW	Annexure 2B
3	Biomass Power Projects	Annexure 3
4	Non-Fossil Fuel-based Co-Generation Projects	Annexure 4
5	Solar Projects	
	Solar PV Projects	Annexure 5A
	Solar Thermal Power Projects	Annexure 5B

Sd/-
(Deepak Lad)
Member

Sd/-
(Azeez M. Khan)
Member

List of Organisations/persons who submitted Suggestions and Objections

Sr. No.	Name
1	Inox Wind ltd.
2	Maharashtra Biomass Energy Developers Association
3	Cogeneration Association of India
4	Shri. Ratan Shah
5	Maharashtra State Power Generation Co. Ltd.
6	Maharashtra State Electricity Distribution Co. Ltd.
7	Indian Wind Turbine Manufacturers Association
8	Reliance Power Limited
9	Maha Co-Gen Green Power Producers Association
10	Greta Group
11	Shri. Ajay Chandak
12	Shri. Shyam Patil
13	Ruchi Soya Ind. Ltd.
14	Shri. Uday Kamat (Yash Agro Energy Limited)
15	Maharashtra Veej Grahak Sanghatana
16	Inox Renewables
17	Spark Green Energy (Satara) Ltd
18	Spark Green Energy (Satara) Ltd
19	A. A. Energy Limited
20	Kalyani Renewable Energy Limited
21	ReNew Power Ventures Private Limited
22	Gangamai Industries and Construction Limited
23	Shri. T.P. Vartak, Hydro Power Association of India
24	ReGen Power Tech Private Limited
25	Hindustan EPC Company Limited
26	Indian Wind Energy Association
27	Maharashtra Energy Development Agency
28	Dr.Ashok Pendse, Thane-Belapur Industries Association

List of Organisations/persons at the Public Hearing held on 23 December, 2015

Sr. No	Name
1.	Shri. M.M. Davare , BEST Undertaking
2.	Shri. Awesh Jain, M/s Ruchi Soya Ind. Ltd.
3.	Shri. Uday Kamat, Yash Agro Energy Limited
4.	Maharashtra Biomass Energy Developers Association
5.	Maha Co-Gen Green Power Producers Association
6.	Shri. T.P. Vartak, Hydro Power Association of India
7.	Shri. Ishan Nagpal, ReNew Power Ventures Private Limited
8.	Shri. Rajesh Dhakar, ReNew Power Ventures Private Limited
9.	Shri. Abhay Kulkarni, Cogeneration Association of India
10.	Shri. Dheeraj Jain, ReGen Power Tech Private Limited
11.	Shri. Pradeep Mittal, Dalmia Sugar and Industries Ltd.
12.	Shri. P.K.Puri, Lloyds Metals and Energy Limited
13.	Shri. M.N. Menghranjan, DLJ Power (India Ltd.)
14.	Shri. Krishna Sheety
15.	Shri. Brajesh Kumar, CLP India
16.	Shri. Sushant Gaikwad
17.	Shri. Vikalp Vats
18.	Shri. Dharmendra Gupta
19.	Shri. Santosh Singh, R Infra
20.	Shri. Amit Gupta, Vestas
21.	Shri. Sanjay A C, SSPL
22.	Shri. Swapnil Agarwal, A A Energy Ltd.
23.	Shri. Prakash Patel, Green Infra Ltd.
24.	Shri. Denish Gandhi, Gamesa Renewables
25.	Shri. Vinayak Jadhav, MSPL Nagpur
26.	Shri. Charitra Kumar Jain, Sun Energy, Chennai
27.	Shri. S Pnrvathinathan Durga Srinivas
28.	Shri. R.G.Thambe, Sahyadri SSK Karad
29.	Shri. Jagadish F, Maharashtra Biomass Energy Developers Association
30.	Shri. Satyajit Suklabaidya, IMaCS
31.	Shri. Karan Swar, IMaCS

Annexure – 1A
(Wind Zone-1)

Form 1.1 Assumptions Parameters

Wind Zone

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	1
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	22.0%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	600.74
3	Sources of Fund		Tariff Period	Years	25
		<u>Debt: Equity</u>			
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	420.52
			Total Equity Amount	Rs Lacs	180.22
		<u>Debt Component</u>			
			Loan Amount	Rs Lacs	420.52
			Repayment Period(incl'd Moratorium)	years	12
			Interest Rate	%	13.00%
		<u>Equity Component</u>			
			Equity amount	Rs Lacs	180.22
			Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.34%
	RoE Period	Year	10.00		
	Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.47%		
	Weighted average of ROE		23%		
	Discount Rate		10.75%		
4	Financial Assumptions	<u>Fiscal Assumptions</u>			
			Income Tax	%	34.61%
			MAT Rate (for first 10 years)	%	21.34%
		<u>Depreciation</u>			
			Depreciation Rate for first 12 years	%	5.83%
	Depreciation Rate 13th year onwards	%	1.54%		
	Years for 5.83% rate		12		
5	Working Capital	<u>For Fixed Charges</u>			
		O&M Charges		Months	1
		Maintenance Spare	(% of O&M exepenses)		15.00%
		Receivables for Debtors		Months	2
	Interest On Working Capital		%	13.50%	
6	Operation & Maintenance	power plant (FY15-16)		Rs Lakh	8.83
		<u>Total O & M Expenses Escalation</u>		%	5.72%

Form 1.2 Form Template for (Wind Power Projects: Determination of Tariff Component)

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		8.83	9.34	9.87	10.43	11.03	11.66	12.33	13.03	13.78	14.57	15.40	16.28	17.21	18.20	19.24	20.34	21.50	22.73	24.03	25.41	26.86	28.40	30.02	31.74	33.56
Depreciation	Rs Lakh		35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24
Interest on term loan	Rs Lakh		52.39	47.83	43.28	38.72	34.17	29.61	25.06	20.50	15.94	11.39	6.83	2.28	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
Interest on working Capital	Rs Lakh		2.75	2.77	2.79	2.80	2.82	2.84	2.86	2.89	2.91	2.93	2.96	2.99	3.02	3.05	3.08	3.12	3.15	3.19	3.23	3.28	3.32	3.37	3.42	3.47	3.53
Return on Equity	Rs Lakh		36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10
Total Fixed Cost	Rs Lakh		135.68	131.64	127.64	123.66	119.72	115.82	111.95	108.12	104.34	100.59	104.34	100.69	73.57	74.59	75.66	76.79	77.99	79.26	80.61	82.02	83.52	85.11	86.78	88.55	90.43
Per unit Fixed Cost	Rs/kWh	5.71	7.04	6.83	6.62	6.42	6.21	6.01	5.81	5.61	5.41	5.22	5.41	5.22	3.82	3.87	3.93	3.98	4.05	4.11	4.18	4.26	4.33	4.42	4.50	4.59	4.69

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh	0.73	0.46	0.48	0.51	0.54	0.57	0.61	0.64	0.68	0.72	0.76	0.80	0.84	0.89	0.94	1.00	1.06	1.12	1.18	1.25	1.32	1.39	1.47	1.56	1.65	1.74
Depreciation	Rs/kWh	1.51	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Int. on term loan	Rs/kWh	1.30	2.72	2.48	2.25	2.01	1.77	1.54	1.30	1.06	0.83	0.59	0.35	0.12	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
Int. on working capital	Rs/kWh	0.15	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.18	0.18	0.18
RoE	Rs/kWh	2.02	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29
Total COG	Rs/kWh	5.71	7.04	6.83	6.62	6.42	6.21	6.01	5.81	5.61	5.41	5.22	5.41	5.22	3.82	3.87	3.93	3.98	4.05	4.11	4.18	4.26	4.33	4.42	4.50	4.59	4.69

COG excl. RoE

Discount Factor			1	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09
Fixed Cost	5.71		110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00
Levallised Tariff	5.71	Rs/Unit																									

Determination of Additional Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	21.342%
Income Tax (Normal Rates)	34.608%
Capital Cost	600.74

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Book Depreciation	%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Allowed during the year	%	100.00%	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%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	0.0%	0.0%	0.0%	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%	0.00%	0.00%	0.00%	0.00%
Accelerated Depm.	Rs Lakh	600.74	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	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	569.02	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	196.93	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	0.96	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93
Per unit benefit	Rs/Unit	20.44	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09
Applicable Discounting Factor		1.00	0.95	0.86	0.77	0.70	0.63	0.57	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.12	0.11	0.10	0.09

Levillised benefit	0.61	Rs/Unit
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Annexure – 1B
(Wind Zone-2)

Form 1.1 Assumptions Parameters

Wind Zone

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	1
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	22.0%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	600.74
3	Sources of Fund		Tariff Period	Years	25
			<u>Debt: Equity</u>		
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	420.52
			Total Equity Amount	Rs Lacs	180.22
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	420.52
			Repayment Period(incl. Moratorium)	years	12
			Interest Rate	%	13.00%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	180.22
			Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.34%
			RoE Period	Year	10.00
Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.47%			
Weighted average of ROE		23%			
Discount Rate		10.75%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	34.61%
			MAT Rate (for first 10 years)	%	21.34%
			<u>Depreciation</u>		
			Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13th year onwards	%	1.54%
			Years for 5.83% rate		12
5	Working Capital	<u>For Fixed Charges</u>	O&M Charges	Months	1
			Maintenance Spare	(% of O&M expenses)	15.00%
			Receivables for Debtors	Months	2
			Interest On Working Capital	%	13.50%
6	Operation & Maintenance	power plant (FY15-16)		Rs Lakh	8.83
			<u>Total O & M Expenses Escalation</u>	%	5.72%

Form 1.2 Form Template for (Wind Power Projects: Determination of Tariff Component

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		8.83	9.34	9.87	10.43	11.03	11.66	12.33	13.03	13.78	14.57	15.40	16.28	17.21	18.20	19.24	20.34	21.50	22.73	24.03	25.41	26.86	28.40	30.02	31.74	33.56
Depreciation	Rs Lakh		35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24
Interest on term loan	Rs Lakh		52.39	47.83	43.28	38.72	34.17	29.61	25.06	20.50	15.94	11.39	6.83	2.28	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
Interest on working Capital	Rs Lakh		2.75	2.77	2.79	2.80	2.82	2.84	2.86	2.89	2.91	2.93	2.96	2.99	3.02	3.05	3.08	3.12	3.15	3.19	3.23	3.28	3.32	3.37	3.42	3.47	3.53
Return on Equity	Rs Lakh		36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10
Total Fixed Cost	Rs Lakh		135.68	131.64	127.64	123.66	119.72	115.82	111.95	108.12	104.34	100.59	104.34	100.69	73.57	74.59	75.66	76.79	77.99	79.26	80.61	82.02	83.52	85.11	86.78	88.55	90.43
Per unit Fixed Cost	Rs/kWh	5.02	6.20	6.01	5.83	5.65	5.47	5.29	5.11	4.94	4.76	4.59	4.76	4.60	3.36	3.41	3.45	3.51	3.56	3.62	3.68	3.75	3.81	3.89	3.96	4.04	4.13

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh	0.64	0.40	0.43	0.45	0.48	0.50	0.53	0.56	0.60	0.63	0.67	0.70	0.74	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30	1.37	1.45	1.53
Depreciation	Rs/kWh	1.32	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Int. on term loan	Rs/kWh	1.15	2.39	2.18	1.98	1.77	1.56	1.35	1.14	0.94	0.73	0.52	0.31	0.10	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
Int. on working capital	Rs/kWh	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16
RoE	Rs/kWh	1.78	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01
Total COG	Rs/kWh	5.02	6.20	6.01	5.83	5.65	5.47	5.29	5.11	4.94	4.76	4.59	4.76	4.60	3.36	3.41	3.45	3.51	3.56	3.62	3.68	3.75	3.81	3.89	3.96	4.04	4.13

COG excl. RoE

Discount Factor			1	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09	
Fixed Cost	5.02		110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00
Levillised Tariff	5.02	Rs/Unit																										

Determination of Additional Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	21.342%
Income Tax (Normal Rates)	34.608%
Capital Cost	600.74

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Book Depreciation	%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Allowed during the year	%	100.00%	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%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	0.0%	0.0%	0.0%	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%	0.00%	0.00%	0.00%	0.00%
Accelerated Depm.	Rs Lakh	600.74	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	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	569.02	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	196.93	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	1.10	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19
Per unit benefit	Rs/Unit	17.98	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09
Applicable Discounting Factor		1.00	0.95	0.86	0.77	0.70	0.63	0.57	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.12	0.11	0.10	0.09

Levellised benefit	0.53	Rs/Unit
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Annexure – 1C
(Wind Zone-3)

Form 1.1 Assumptions Parameters

Wind Zone

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	1	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	22.0%	
			Useful Life	Years	25	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	600.74	
3	Sources of Fund	Debt: Equity	Tariff Period	Years	25	
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	420.52	
			Total Equity Amount	Rs Lacs	180.22	
			Debt Component	Loan Amount	Rs Lacs	420.52
				Repayment Period(incl. Moratorium)	years	12
				Interest Rate	%	13.00%
			Equity Component	Equity amount	Rs Lacs	180.22
				Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.34%
				RoE Period	Year	10.00
Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.47%				
Weighted average of ROE		23%				
Discount Rate		10.75%				
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	34.61%	
			MAT Rate (for first 10 years)	%	21.34%	
			Depreciation	Depreciation Rate for first 12 years	%	5.83%
				Depreciation Rate 13th year onwards	%	1.54%
				Years for 5.83% rate		12
5	Working Capital	For Fixed Charges	O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15.00%	
			Receivables for Debtors	Months	2	
			Interest On Working Capital	%	13.50%	
6	Operation & Maintenance	power plant (FY15-16)		Rs Lakh	8.83	
			Total O & M Expenses Escalation	%	5.72%	

Form 1.2 Form Template for (Wind Power Projects: Determination of Tariff Component

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		8.83	9.34	9.87	10.43	11.03	11.66	12.33	13.03	13.78	14.57	15.40	16.28	17.21	18.20	19.24	20.34	21.50	22.73	24.03	25.41	26.86	28.40	30.02	31.74	33.56
Depreciation	Rs Lakh		35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24
Interest on term loan	Rs Lakh		52.39	47.83	43.28	38.72	34.17	29.61	25.06	20.50	15.94	11.39	6.83	2.28	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
Interest on working Capital	Rs Lakh		2.75	2.77	2.79	2.80	2.82	2.84	2.86	2.89	2.91	2.93	2.96	2.99	3.02	3.05	3.08	3.12	3.15	3.19	3.23	3.28	3.32	3.37	3.42	3.47	3.53
Return on Equity	Rs Lakh		36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10
Total Fixed Cost	Rs Lakh		135.68	131.64	127.64	123.66	119.72	115.82	111.95	108.12	104.34	100.59	104.34	100.69	73.57	74.59	75.66	76.79	77.99	79.26	80.61	82.02	83.52	85.11	86.78	88.55	90.43
Per unit Fixed Cost	Rs/kWh	4.19	5.16	5.01	4.86	4.71	4.56	4.41	4.26	4.11	3.97	3.83	3.97	3.83	2.80	2.84	2.88	2.92	2.97	3.02	3.07	3.12	3.18	3.24	3.30	3.37	3.44

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh	0.54	0.34	0.36	0.38	0.40	0.42	0.44	0.47	0.50	0.52	0.55	0.59	0.62	0.66	0.69	0.73	0.77	0.82	0.87	0.91	0.97	1.02	1.08	1.14	1.21	1.28
Depreciation	Rs/kWh	1.10	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Int. on term loan	Rs/kWh	0.95	1.99	1.82	1.65	1.47	1.30	1.13	0.95	0.78	0.61	0.43	0.26	0.09	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
Int. on working capital	Rs/kWh	0.11	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13
RoE	Rs/kWh	1.48	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68
Total COG	Rs/kWh	4.19	5.16	5.01	4.86	4.71	4.56	4.41	4.26	4.11	3.97	3.83	3.97	3.83	2.80	2.84	2.88	2.92	2.97	3.02	3.07	3.12	3.18	3.24	3.30	3.37	3.44

COG excl. RoE

Discount Factor			1	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09	
Fixed Cost	4.19		110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00
Levillised Tariff	4.19	Rs/Unit																										

Determination of Additional Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	21.342%
Income Tax (Normal Rates)	34.608%
Capital Cost	600.74

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Book Depreciation	%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Allowed during the year	%	100.00%	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%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	0.0%	0.0%	0.0%	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%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	600.74	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	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	569.02	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	196.93	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	1.31	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63
Per unit benefit	Rs/Unit	14.99	-0.42	-0.42	-0.42	-0.42	-0.42	-0.42	-0.42	-0.42	-0.42	-0.42	-0.42	-0.42	-0.42	-0.42	-0.42	-0.42	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09
Applicable Discounting Factor		1.00	0.95	0.86	0.77	0.70	0.63	0.57	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.12	0.11	0.10	0.09

Levillised benefit	0.44	Rs/Unit
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Annexure – 1D
(Wind Zone-4)

Form 1.1 Assumptions Parameters

Wind Zone

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	1
1	Power Generation	<u>Capacity</u>	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	22.0%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	600.74
3	Sources of Fund	<u>Debt: Equity</u>	Tariff Period	Years	25
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	420.52
			Total Equity Amount	Rs Lacs	180.22
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	420.52
			Repayment Period(incl. Moratorium)	years	12
			Interest Rate	%	13.00%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	180.22
			Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.34%
			RoE Period	Year	10.00
			Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.47%
Weighted average of ROE		23%			
Discount Rate		10.75%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	34.61%
			MAT Rate (for first 10 years)	%	21.34%
			<u>Depreciation</u>		
			Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13th year onwards	%	1.54%
			Years for 5.83% rate		12
5	Working Capital	<u>For Fixed Charges</u>	O&M Charges	Months	1
			Maintenance Spare	(% of O&M expenses)	15.00%
			Receivables for Debtors	Months	2
			Interest On Working Capital	%	13.50%
6	Operation & Maintenance	power plant (FY15-16)		Rs Lakh	8.83
			<u>Total O & M Expenses Escalation</u>	%	5.72%

Form 1.2 Form Template for (Wind Power Projects: Determination of Tariff Component

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		8.83	9.34	9.87	10.43	11.03	11.66	12.33	13.03	13.78	14.57	15.40	16.28	17.21	18.20	19.24	20.34	21.50	22.73	24.03	25.41	26.86	28.40	30.02	31.74	33.56
Depreciation	Rs Lakh		35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	35.04	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24	9.24
Interest on term loan	Rs Lakh		52.39	47.83	43.28	38.72	34.17	29.61	25.06	20.50	15.94	11.39	6.83	2.28	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
Interest on working Capital	Rs Lakh		2.75	2.77	2.79	2.80	2.82	2.84	2.86	2.89	2.91	2.93	2.96	2.99	3.02	3.05	3.08	3.12	3.15	3.19	3.23	3.28	3.32	3.37	3.42	3.47	3.53
Return on Equity	Rs Lakh		36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	36.66	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10	44.10
Total Fixed Cost	Rs Lakh		135.68	131.64	127.64	123.66	119.72	115.82	111.95	108.12	104.34	100.59	104.34	100.69	73.57	74.59	75.66	76.79	77.99	79.26	80.61	82.02	83.52	85.11	86.78	88.55	90.43
Per unit Fixed Cost	Rs/kWh	3.92	4.84	4.70	4.55	4.41	4.27	4.13	3.99	3.86	3.72	3.59	3.72	3.59	2.62	2.66	2.70	2.74	2.78	2.83	2.88	2.93	2.98	3.04	3.10	3.16	3.23

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh	0.50	0.32	0.33	0.35	0.37	0.39	0.42	0.44	0.46	0.49	0.52	0.55	0.58	0.61	0.65	0.69	0.73	0.77	0.81	0.86	0.91	0.96	1.01	1.07	1.13	1.20
Depreciation	Rs/kWh	1.03	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Int. on term loan	Rs/kWh	0.89	1.87	1.71	1.54	1.38	1.22	1.06	0.89	0.73	0.57	0.41	0.24	0.08	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
Int. on working capital	Rs/kWh	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.13
RoE	Rs/kWh	1.39	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57
Total COG	Rs/kWh	3.92	4.84	4.70	4.55	4.41	4.27	4.13	3.99	3.86	3.72	3.59	3.72	3.59	2.62	2.66	2.70	2.74	2.78	2.83	2.88	2.93	2.98	3.04	3.10	3.16	3.23

COG excl. RoE

Discount Factor			1	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09
Fixed Cost	3.92		110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00	110.00
Levillised Tariff	3.92	Rs/Unit																									

Determination of Additional Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	21.342%
Income Tax (Normal Rates)	34.608%
Capital Cost	600.74

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Book Depreciation	%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	31.72	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Allowed during the year	%	100.00%	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%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	0.0%	0.0%	0.0%	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%	0.00%	0.00%	0.00%	0.00%
Accelerated Depm.	Rs Lakh	600.74	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	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	569.02	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-31.72	-1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	196.93	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-10.98	-0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	1.40	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Per unit benefit	Rs/Unit	14.05	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.39	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09
Applicable Discounting Factor		1.00	0.95	0.86	0.77	0.70	0.63	0.57	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.12	0.11	0.10	0.09

Levelised benefit	0.42	Rs/Unit
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Annexure – 2A
(SHP above 1 MW and up to and including 5 MW)

Form 1.1 Assumptions Parameters

Capacity

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	<=5 MW
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	30%
			Auxilliary Consumption		1%
			Useful Life	Years	35
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	605.28
3	Sources of Fund		Tariff Period	Years	35
			<u>Debt: Equity</u>		
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	423.70
			Total Equity Amount	Rs Lacs	181.58
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	423.70
			Repayment Period(incl Moratorium)	years	12
			Interest Rate	%	13.00%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	181.58
			Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.34%
			RoE Period	Year	10
Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.47%			
Weighted average of ROE		23.29%			
Discount Rate		10.75%			
4	Financial Assumptions		<u>Fiscal Assumptions</u>		
			Income Tax	%	34.608%
			MAT Rate (for first 10 years)	%	21.342%
			<u>Depreciation</u>		
			Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13th year onwards	%	0.87%
Years for 5.83% rate		12			
5	Working Capital		<u>For Fixed Charges</u>		
			O&M Charges	Months	1
			Maintenance Spare	(% of O&M exepenses)	15%
			Receivables for Debtors	Months	2
			Interest On Working Capital	%	13.50%
6	Operation & Maintenance		power plant (FY15-16)	Rs Lakh	21.79
			Total O & M Expenses Escalation	%	5.72%

Form 1.2 Form Template for (Small Hydro Projects) : Determination of Tariff Component

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Net Generation	MU		2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
O&M Expenses	Rs Lakh		21.79	23.04	24.35	25.75	27.22	28.78	30.42	32.16	34.00	35.95	38.00	40.18	42.48	44.91	47.47	50.19	53.06	56.10	59.30	62.70	66.28	70.07	74.08	78.32	82.80	87.54	92.54	97.84	103.43	109.35	115.60	122.22	129.21	136.60	144.41	
Depreciation	Rs Lakh		35.31	35.31	35.31	35.31	35.31	35.31	35.31	35.31	35.31	35.31	35.31	35.31	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26
Interest on term loan	Rs Lakh		52.79	48.20	43.61	39.02	34.43	29.84	25.25	20.66	16.07	11.48	6.89	2.30	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	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		3.69	3.72	3.77	3.81	3.86	3.91	3.96	4.01	4.07	4.13	4.20	4.26	4.34	4.41	4.49	4.58	4.67	4.77	4.87	4.97	5.09	5.21	5.33	5.47	5.61	5.76	5.91	6.08	6.26	6.44	6.64	6.85	7.07	7.30	7.55	
Return on Equity	Rs Lakh		36.94	36.94	36.94	36.94	36.94	36.94	36.94	36.94	36.94	36.94	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43	44.43
Total Fixed Cost	Rs Lakh		150.50	147.20	143.97	140.82	137.75	134.76	131.87	129.07	126.38	123.80	128.82	126.47	96.51	99.01	101.66	104.46	107.42	110.55	113.86	117.36	121.06	124.97	129.11	133.48	138.10	142.99	148.15	153.61	159.38	165.49	171.94	178.76	185.97	193.59	201.65	
Per unit Fixed Cost	Rs/kWh	5.12	5.78	5.66	5.53	5.41	5.29	5.18	5.07	4.96	4.86	4.76	4.95	4.86	3.71	3.81	3.91	4.02	4.13	4.25	4.38	4.51	4.65	4.80	4.96	5.13	5.31	5.50	5.69	5.90	6.13	6.36	6.61	6.87	7.15	7.44	7.75	

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
O&M expn	Rs/kWh	1.48	0.84	0.89	0.94	0.99	1.05	1.11	1.17	1.24	1.31	1.38	1.46	1.54	1.63	1.73	1.82	1.93	2.04	2.16	2.28	2.41	2.55	2.69	2.85	3.01	3.18	3.36	3.56	3.76	3.98	4.20	4.44	4.70	4.97	5.25	5.55
Depreciation	Rs/kWh	1.04	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Int. on term loan	Rs/kWh	0.92	2.03	1.85	1.68	1.50	1.32	1.15	0.97	0.79	0.62	0.44	0.26	0.09	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	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.16	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.18	0.18	0.18	0.19	0.19	0.20	0.20	0.20	0.21	0.22	0.22	0.23	0.23	0.24	0.25	0.26	0.26	0.27	0.28	0.29
RoE	Rs/kWh	1.52	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71
Total COG	Rs/kWh	5.12	5.78	5.66	5.53	5.41	5.29	5.18	5.07	4.96	4.86	4.76	4.95	4.86	3.71	3.81	3.91	4.02	4.13	4.25	4.38	4.51	4.65	4.80	4.96	5.13	5.31	5.50	5.69	5.90	6.13	6.36	6.61	6.87	7.15	7.44	7.75

COG excl. RoE

Discount Factor		1	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.06	0.06	0.05	0.05	0.04	0.04	0.03	0.03	
Fixed Cost	5.12	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28	133.28
Levillised Tariff	5.12	Rs/Unit																																			

Determination of Additional Depreciation for Small Hydro Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	21.342%
Income Tax (Normal Rates)	34.608%
Capital Cost	605.28

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Book Depreciation	%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	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%
Book Depreciation	Rs Lakh	31.96	31.96	31.96	31.96	31.96	31.96	31.96	31.96	31.96	31.96	31.96	31.96	31.96	31.96	31.96	31.96	31.96	1.45	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

Accelerated Depreciation																																						
Opening	%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	100%	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%	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%
Closing	%	0.0%	0.0%	0.0%	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%	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%	
Accelerated Depm.	Rs Lakh	605.28	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	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	

Net Depreciation Benefit	Rs Lakh	573.32	-31.96	-31.96	-31.96	-31.96	-31.96	-31.96	-31.96	-31.96	-31.96	-31.96	-31.96	-31.96	-31.96	-31.96	-31.96	-31.96	-1.45	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	
Tax Benefit	Rs Lakh	198.42	-11.06	-11.06	-11.06	-11.06	-11.06	-11.06	-11.06	-11.06	-11.06	-11.06	-11.06	-11.06	-11.06	-11.06	-11.06	-11.06	-0.50	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	0.00
Energy generation	MU	1.30	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	
Applicable Discounting Factor		1.00	0.95	0.96	0.77	0.70	0.63	0.57	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.12	0.11	0.10	0.09	0.08	0.07	0.07	0.06	0.05	0.05	0.04	0.04	0.04	0.03		

Levelised benefit	0.43	Rs/Unit
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Annexure – 2B

(SHP above 5 MW and upto and including 25 MW)

Form 1.1 Assumptions Parameters

Capacity

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	>5 up to 25 MW	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	30%	
			Auxilliary Consumption		1%	
			Useful Life	Years	35	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	550.70	
3	Sources of Fund	Debt: Equity	Tariff Period	Years	13	
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	385.49	
			Total Equity Amout	Rs Lacs	165.21	
			Debt Component	Loan Amount	Rs Lacs	385.49
				Repayment Period(incld Moratorium)	years	12
				Interest Rate	%	13.00%
			Equity Component	Equity amount	Rs Lacs	165.21
				Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.34%
				RoE Period	Year	10
				Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.47%
Weighted average of ROE		22.57%				
Discount Rate		10.75%				
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	34.608%	
			MAT Rate (for first 10 years)	%	21.342%	
			Depreciation	Depreciation Rate for first 12 years	%	5.83%
				Depreciation Rate 13th year onwards	%	0.87%
				Years for 5.83% rate		12
5	Working Capital	For Fixed Charges	O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			Interest On Working Capital	%	13.50%	
6	Operation & Maintenance	power plant (FY15-16)		Rs Lakh	15.42	
			Total O & M Expenses Escalation	%	5.72%	

Form 1.2 Form Template for (Small Hydro Projects) : Determination of Tariff Component

Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Net Generation	MU		2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60

Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M Expenses	Rs Lakh		15.42	16.30	17.23	18.22	19.26	20.36	21.53	22.76	24.06	25.44	26.89	28.43	30.06	31.78	33.59	35.52	37.55	39.70	41.97	44.37	46.90	49.59	52.42	55.42	58.59	61.94	65.49	69.23	73.19	77.38	81.81	86.49	91.43	96.66	102.19
Depreciation	Rs Lakh		32.12	32.12	32.12	32.12	32.12	32.12	32.12	32.12	32.12	32.12	32.12	32.12	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80
Interest on term loan	Rs Lakh		48.03	43.85	39.67	35.50	31.32	27.14	22.97	18.79	14.62	10.44	6.26	2.09	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	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		3.03	3.06	3.09	3.12	3.15	3.19	3.22	3.26	3.30	3.34	3.39	3.44	3.49	3.54	3.60	3.66	3.73	3.79	3.87	3.94	4.02	4.11	4.19	4.29	4.39	4.49	4.61	4.72	4.85	4.98	5.12	5.27	5.42	5.59	5.76
Return on Equity	Rs Lakh		33.61	33.61	33.61	33.61	33.61	33.61	33.61	33.61	33.61	33.61	33.61	33.61	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42	40.42
Total Fixed Cost	Rs Lakh		132.20	128.94	125.72	122.56	119.46	116.42	113.45	110.54	107.71	104.95	102.10	99.31	96.57	93.88	91.24	88.65	86.11	83.62	81.18	78.79	76.45	74.16	71.92	69.73	67.59	65.50	63.46	61.47	59.53	57.64	55.80	54.01	52.27	50.58	
Per unit Fixed Cost	Rs/kWh	4.35	5.08	4.96	4.83	4.71	4.59	4.47	4.36	4.25	4.14	4.03	3.92	3.81	3.70	3.59	3.48	3.37	3.26	3.15	3.04	2.93	2.82	2.71	2.60	2.49	2.38	2.27	2.16	2.05	1.94	1.83	1.72	1.61	1.50	1.39	

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
O&M expn	Rs/kWh	1.05	0.59	0.63	0.66	0.70	0.74	0.78	0.83	0.87	0.92	0.98	1.03	1.09	1.16	1.22	1.29	1.37	1.44	1.53	1.61	1.71	1.80	1.91	2.01	2.13	2.25	2.38	2.52	2.66	2.81	2.97	3.14	3.32	3.51	3.72	3.93
Depreciation	Rs/kWh	0.95	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Int. on term loan	Rs/kWh	0.84	1.85	1.69	1.52	1.36	1.20	1.04	0.88	0.72	0.56	0.40	0.24	0.08	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	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.17	0.17	0.18	0.19	0.19	0.20	0.20	0.21	0.21	0.21	0.22	
RoE	Rs/kWh	1.38	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	
Total COG	Rs/kWh	4.35	5.08	4.96	4.83	4.71	4.59	4.47	4.36	4.25	4.14	4.03	3.92	3.81	3.70	3.59	3.48	3.37	3.26	3.15	3.04	2.93	2.82	2.71	2.60	2.49	2.38	2.27	2.16	2.05	1.94	1.83	1.72	1.61	1.50		

COG excl. RoE

Discount Factor		1	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.06	0.06	0.05	0.05	0.04	0.04	0.03	0.03	
Fixed Cost	4.35	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	113.05	
Levillised Tariff	4.35	Rs/Unit																																			

Determination of Additional Depreciation for Small Hydro Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	21.342%
Income Tax (Normal Rates)	34.608%
Capital Cost	550.70

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Book Depreciation	%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	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%
Book Depreciation	Rs Lakh	29.08	29.08	29.08	29.08	29.08	29.08	29.08	29.08	29.08	29.08	29.08	29.08	29.08	29.08	29.08	29.08	29.08	1.32	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

Accelerated Depreciation

Opening	%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	100.00%	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%	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%
Closing	%	0.0%	0.0%	0.0%	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%	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%
Accelerated Depm.	Rs Lakh	550.70	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	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

Net Depreciation Benefit	Rs Lakh	521.62	-29.08	-29.08	-29.08	-29.08	-29.08	-29.08	-29.08	-29.08	-29.08	-29.08	-29.08	-29.08	-29.08	-29.08	-29.08	-29.08	-1.32	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
Tax Benefit	Rs Lakh	180.52	-10.06	-10.06	-10.06	-10.06	-10.06	-10.06	-10.06	-10.06	-10.06	-10.06	-10.06	-10.06	-10.06	-10.06	-10.06	-10.06	-0.46	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
Energy generation	MU	1.30	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
Applicable Discounting Factor		1.00	0.95	0.86	0.77	0.70	0.63	0.57	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.12	0.11	0.10	0.09	0.08	0.07	0.07	0.06	0.05	0.05	0.04	0.04	0.04	0.03	

Levellised benefit	0.39	Rs/Unit
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Annexure – 3
(Biomass Power Project)

2.1 Form Template for Biomass Power Projects- Other

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Auxillary Consumption during stabilisation	%	10%	
			Auxillary Consumption after stabilisation	%	10%	
			PLF(Stablization for 6 months)	%	60%	
			PLF(during first year after Stablization)	%	70%	
			PLF(second year onwards)	%	80%	
			Useful Life	Years	20	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	494.32	
3	Financial Assumptions	<u>Debt: Equity</u>	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	346.02	
			Total Equity Amout	Rs Lacs	148.30	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	346.02
				Repayment Period(inclد Moratorium)	years	12
				Interest Rate	%	13.00%
			<u>Equity Component</u>	Equity amount	Rs Lacs	148.30
				Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.34%
				RoE Period	Year	10.00
				Return on Equity 11th year onwards (16% gross up with Income tax rate)		24.47%
	Weighted average of ROE		22.40%			
	Discount Rate (equiv. to WACC)		10.75%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	34.61%	
			MAT Rate (for first 10 years)	%	21.34%	
			<u>Depreciation</u>	Depreciation Rate(power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.50%
				Years for 5.83% depreciation rate		12.00
5	Working Capital	<u>For Fixed Charges</u>	O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			<u>For Variable Charges</u>	Biomass Stock	Months	4
				Interest On Working Capital	%	13.50%
6	Fuel Related Assumptions	<u>Heat Rate</u>	After Stabilisation period	Kcal/kwh	4200	
			During Stablization Period	Kcal/kwh	3800	
			<u>Biomass</u>	Base Price(FY15-16)	Rs/T	3987.00
				GCV - Biomass	Kcal/kg	3611
7	Operation & Maintenance		power plant (FY 2015-16)	Rs Lakh	26.30	
			Total O & M Expenses Escalation	%	5.72%	

2.2 Form Template for (Biomass Power Projects) : Determination of Tariff Component

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		5.69	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
Auxiliary Consumption	MU		0.57	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Net Generation	MU		5.12	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31

Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		264.05	324.98	324.98	324.98	324.98	324.98	324.98	324.98	324.98	324.98	324.98	324.98	324.98	324.98	324.98	324.98	324.98	324.98	324.98	324.98
Per unit Var Cost	Rs/kWh		5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		26.30	27.80	29.39	31.07	32.85	34.73	36.72	38.82	41.04	43.38	45.87	48.49	51.26	54.20	57.30	60.57	64.04	67.70	71.57	75.67
Depreciation	Rs Lakh		28.84	28.84	28.84	28.84	28.84	28.84	28.84	28.84	28.84	28.84	28.84	28.84	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36
Interest on term loan	Rs Lakh		43.11	39.36	35.61	31.86	28.11	24.37	20.62	16.87	13.12	9.37	5.62	1.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		21.36	26.14	26.19	26.25	26.30	26.36	26.42	26.49	26.56	26.63	26.71	26.80	26.88	26.97	27.07	27.18	27.28	27.40	27.52	27.65
Return on Equity	Rs Lakh		30.17	30.17	30.17	30.17	30.17	30.17	30.17	30.17	30.17	30.17	36.28	36.28	36.28	36.28	36.28	36.28	36.28	36.28	36.28	36.28
Total Fixed Cost	Rs Lakh		149.77	152.31	150.20	148.18	146.27	144.46	142.76	141.18	139.72	138.39	143.32	142.28	126.79	129.81	133.01	136.39	139.97	143.74	147.74	151.96
Per unit Fixed Cost	Rs/kWh		2.92	2.41	2.38	2.35	2.32	2.29	2.26	2.24	2.22	2.19	2.27	2.26	2.01	2.06	2.11	2.16	2.22	2.28	2.34	2.41

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levallised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15
O&M expn	Rs/kWh	0.63	0.51	0.44	0.47	0.49	0.52	0.55	0.58	0.62	0.65	0.69	0.73	0.77	0.81	0.86	0.91	0.96	1.02	1.07	1.13	1.20
Depreciation	Rs/kWh	0.42	0.56	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Int. on term loan	Rs/kWh	0.36	0.84	0.62	0.56	0.51	0.45	0.39	0.33	0.27	0.21	0.15	0.09	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.42	0.42	0.41	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.43	0.43	0.43	0.43	0.43	0.43	0.44	0.44
RoE	Rs/kWh	0.52	0.59	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Total COG	Rs/kWh	7.50	8.08	7.57	7.53	7.50	7.47	7.44	7.42	7.39	7.37	7.35	7.42	7.41	7.16	7.21	7.26	7.32	7.37	7.43	7.49	7.56

Levallised Tariff	Unit	Year ->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.903	0.815	0.736	0.665	0.600	0.542	0.489	0.442	0.399	0.360	0.325	0.294	0.265	0.239	0.216	0.195	0.176	0.159	0.144
Variable Cost			263.9	324.8	324.8	324.8	324.8	324.8	324.8	324.8	324.8	324.8	324.8	324.8	324.8	324.8	324.8	324.8	324.8	324.8	324.8	324.8
Fixed Cost			120.4	148.2	148.2	148.2	148.2	148.2	148.2	148.2	148.2	148.2	148.2	148.2	148.2	148.2	148.2	148.2	148.2	148.2	148.2	148.2

Levallised Tariff (Variable)	5.15
Levallised Tariff (Fixed)	2.35
Levallised Tariff (Rs/Unit)	7.50

Determination of Accelerated Depreciation for Biomass Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	21.342%
Income Tax (Normal Rates)	34.61%
Capital Cost	494.3

Years ----->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Book Depreciation	%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	0.00%	0.00%
Book Depreciation	Rs Lakh	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	26.10	1.19	0.00	0.00

Accelerated Depreciation

Opening	%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	100%	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%	0.00%
Closing	%	0%	0%	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%
Accelerated Depn.	Rs Lakh	494.32	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	0.00

Net Depreciation Benefit	Rs Lakh	468.22	-26.10	-26.10	-26.10	-26.10	-26.10	-26.10	-26.10	-26.10	-26.10	-26.10	-26.10	-26.10	-26.10	-26.10	-26.10	-26.10	-1.19	0.00	0.00
Tax Benefit	Rs Lakh	162.04	-9.03	-9.03	-9.03	-9.03	-9.03	-9.03	-9.03	-9.03	-9.03	-9.03	-9.03	-9.03	-9.03	-9.03	-9.03	-9.03	-0.41	0.00	0.00
Net Energy generation	MU	2.56	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	6.32	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.01	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.77	0.70	0.63	0.57	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15

Tax Benefit Levellised 9.68

Electricity Generation (Levellised) 5.91

Levellised benefit 0.16 (Rs/kWh)

Annexure – 4
(Co-gen. Power Projects)

2.1 Form Template for Cogen Power Projects

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Auxillary Consumption during stabilisation	%	8.5%
			Auxillary Consumption after stabilisation	%	8.5%
			PLF(Stablization for 6 months)	%	60%
			PLF(during first year after Stablization)	%	60%
			PLF(second year onwards)	%	60%
			Useful Life	Years	20
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	489.02
		3	Financial Assumptions	<u>Debt: Equity</u>	Debt
Equity	%				30%
Total Debt Amount	Rs Lacs				342.31
Total Equity Amount	Rs Lacs				146.71
<u>Debt Component</u>	Loan Amount			Rs Lacs	342.31
	Repayment Period(inclld Moratorium)			years	12
	Interest Rate			%	13.00%
<u>Equity Component</u>	Equity amount			Rs Lacs	146.71
	Return on Equity for first 10 years (16% gross up with MAT rate)			% p.a	20.34%
	RoE Period			Year	10.00
	Return on Equity 11th year onwards (16% gross up with Income tax rate)				24.47%
	Discount Rate (equiv. to WACC)				10.75%
4	Financial Assumptions			<u>Fiscal Assumptions</u>	Income Tax
		MAT Rate (for first 10 years)	%		21.34%
		<u>Depreciation</u>	Depreciation Rate(power plant)	%	5.83%
			Depreciation Rate 13th year onwards	%	2.50%
			Years for 5.83% depreciation rate		12.00
5	Working Capital	<u>For Fixed Charges</u>	O&M Charges	Months	1
			Maintenance Spare	(% of O&M exepenses)	15%
		Receivables for Debtors	Months	2	
		<u>For Variable Charges</u>	Biomass Stock	Months	4
			Interest On Working Capital	%	13.50%
6	Fuel Related Assumptions	<u>Heat Rate</u>	After Stabilisation period	Kcal/kwh	3600
		<u>Biomass</u>	Base Price - Bagasse (FY14-15)	Rs/T	2326.84
			GCV - Bagasse	Kcal/kg	2250
7	Operation & Maintenance	power plant (FY 2015-16)			17.31
		<u>Total O & M Expenses Escalation</u>		%	5.72%

2.2 Form Template for (Cogen and Bagasse based Power Projects) : Determination of Tariff Component

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26
Auxiliary Consumption	MU		0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Net Generation	MU		4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81

Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68	195.68

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		17.31	18.30	19.35	20.46	21.63	22.86	24.17	25.55	27.01	28.56	30.19	31.92	33.75	35.68	37.72	39.87	42.15	44.57	47.11	49.81
Depreciation	Rs Lakh		28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53	28.53
Interest on term loan	Rs Lakh		42.65	38.94	35.23	31.52	27.81	24.10	20.40	16.69	12.98	9.27	5.56	1.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		16.48	16.51	16.55	16.58	16.62	16.66	16.70	16.74	16.79	16.84	16.89	16.94	17.00	17.06	17.12	17.19	17.26	17.34	17.42	17.51
Return on Equity	Rs Lakh		29.84	29.84	29.84	29.84	29.84	29.84	29.84	29.84	29.84	29.84	35.90	35.90	35.90	35.90	35.90	35.90	35.90	35.90	35.90	35.90
Total Fixed Cost	Rs Lakh		134.81	132.12	129.49	126.93	124.42	121.99	119.63	117.35	115.15	113.03	117.06	115.14	98.87	100.86	102.96	105.19	107.54	110.03	112.66	115.44

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07
O&M expn	Rs/kWh	0.54	0.36	0.38	0.40	0.43	0.45	0.48	0.50	0.53	0.56	0.59	0.63	0.66	0.70	0.74	0.78	0.83	0.88	0.93	0.98	1.04
Depreciation	Rs/kWh	0.53	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Int. on term loan	Rs/kWh	0.45	0.89	0.81	0.73	0.66	0.58	0.50	0.42	0.35	0.27	0.19	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.35	0.34	0.34	0.34	0.34	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.36	0.36	0.36	0.36	0.36	0.36	0.36
RoE	Rs/kWh	0.65	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Total COG	Rs/kWh	6.59	6.87	6.82	6.76	6.71	6.66	6.61	6.56	6.51	6.46	6.42	6.50	6.46	6.12	6.17	6.21	6.26	6.30	6.36	6.41	6.47

Levillised Tariff	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.903	0.815	0.736	0.665	0.600	0.542	0.489	0.442	0.399	0.360	0.325	0.294	0.265	0.239	0.216	0.195	0.176	0.159	0.144

Levillised Tariff (Variable)	4.07
Levillised Tariff (Fixed)	2.52
Levillised Tariff (Rs/Unit)	6.59

Determination of Accelerated Depreciation for Cogen and Bagasse based Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	21.342%
Income Tax (Normal Rates)	34.61%
Capital Cost	489.0

Years ----->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Book Depreciation	%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	0.00%	0.00%
Book Depreciation	Rs Lakh	25.82	25.82	25.82	25.82	25.82	25.82	25.82	25.82	25.82	25.82	25.82	25.82	25.82	25.82	25.82	25.82	25.82	1.17	0.00	0.00

Accelerated Depreciation

Opening	%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	100%	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%	0.00%
Closing	%	0%	0%	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%
Accelrated Depm.	Rs Lakh	489.02	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	0.00

Net Depreciation Benefit	Rs Lakh	463.20	-25.82	-25.82	-25.82	-25.82	-25.82	-25.82	-25.82	-25.82	-25.82	-25.82	-25.82	-25.82	-25.82	-25.82	-25.82	-25.82	-1.17	0.00	0.00
Tax Benefit	Rs Lakh	160.30	-8.94	-8.94	-8.94	-8.94	-8.94	-8.94	-8.94	-8.94	-8.94	-8.94	-8.94	-8.94	-8.94	-8.94	-8.94	-8.94	-0.41	0.00	0.00
Net Energy generation	MU	2.40	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81
Discounting Factor		1.00	0.95	0.86	0.77	0.70	0.63	0.57	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15

Levllised benefit	0.21	(Rs/kWh)
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Annexure – 5A
(Solar PV)

Form 1.1 Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	19%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	605.85
3	Sources of Fund		Tariff Period	Years	13
			<u>Debt: Equity</u>		
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	424.10
			Total Equity Amount	Rs Lacs	181.76
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	424.10
			Repayment Period(incl Moratorium)	years	12
			Interest Rate	%	13.00%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	181.76
			Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.34%
			RoE Period	Year	10
Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.47%			
Weighted average of ROE		22.40%			
Discount Rate		10.75%			
4	Financial Assumptions		<u>Fiscal Assumptions</u>		
			Income Tax	%	34.61%
			MAT Rate (for first 10 years)	%	21.34%
			<u>Depreciation</u>		
			Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13th year onwards	%	1.54%
Years for 5.83% rate		12			
5	Working Capital		<u>For Fixed Charges</u>		
			O&M Charges	Months	1
			Maintenance Spare	(% of O&M exepenses)	15.00%
			Receivables for Debtors	Months	2
			Interest On Working Capital	%	13.50%
6	Operation & Maintenance		power plant (FY14-15)	Rs Lakh	13.00
			<u>Total O & M Expenses Escalation</u>	%	5.72%

Form 1.2 Form Template for (Solar PV Projects) : Determination of Tariff Component

Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66

Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		13.00	13.74	14.53	15.36	16.24	17.17	18.15	19.19	20.29	21.45	22.67	23.97	25.34	26.79	28.32	29.94	31.66	33.47	35.38	37.40	39.54	41.81	44.20	46.73	49.40
Depreciation	Rs Lakh		35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	35.34	9.32	9.32	9.32	9.32	9.32	9.32	9.32	9.32	9.32	9.32	9.32	9.32	9.32
Interest on term loan	Rs Lakh		52.84	48.24	43.65	39.05	34.46	29.86	25.27	20.67	16.08	11.49	6.89	2.30	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
Interest on working Capital	Rs Lakh		3.06	3.08	3.11	3.13	3.16	3.19	3.22	3.26	3.29	3.33	3.37	3.41	3.45	3.49	3.54	3.59	3.65	3.71	3.77	3.83	3.90	3.97	4.04	4.12	4.21
Return on Equity	Rs Lakh		36.97	36.97	36.97	36.97	36.97	36.97	36.97	36.97	36.97	36.97	44.47	44.47	44.47	44.47	44.47	44.47	44.47	44.47	44.47	44.47	44.47	44.47	44.47	44.47	44.47
Total Fixed Cost	Rs Lakh		141.21	137.38	133.60	129.86	126.17	122.54	118.95	115.43	111.97	108.57	112.74	109.49	82.58	84.08	85.66	87.33	89.10	90.96	92.94	95.03	97.23	99.57	102.03	104.64	107.40
Per unit Fixed Cost	Rs/kWh	7.08	8.48	8.25	8.03	7.80	7.58	7.36	7.15	6.94	6.73	6.52	6.77	6.58	4.96	5.05	5.15	5.25	5.35	5.47	5.58	5.71	5.84	5.98	6.13	6.29	6.45

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh	1.24	0.78	0.83	0.87	0.92	0.98	1.03	1.09	1.15	1.22	1.29	1.36	1.44	1.52	1.61	1.70	1.80	1.90	2.01	2.13	2.25	2.38	2.51	2.66	2.81	2.97
Depreciation	Rs/kWh	1.76	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Int. on term loan	Rs/kWh	1.52	3.17	2.90	2.62	2.35	2.07	1.79	1.52	1.24	0.97	0.69	0.41	0.14	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
Int. on working capital	Rs/kWh	0.20	0.18	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.20	0.20	0.20	0.20	0.21	0.21	0.21	0.22	0.22	0.22	0.23	0.23	0.23	0.24	0.24	0.25	0.25
RoE	Rs/kWh	2.36	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.22	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67
Total COG	Rs/kWh	7.08	8.48	8.25	8.03	7.80	7.58	7.36	7.15	6.94	6.73	6.52	6.77	6.58	4.96	5.05	5.15	5.25	5.35	5.47	5.58	5.71	5.84	5.98	6.13	6.29	6.45

Discount Factor			1	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09
Fixed Cost	7.08		117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82	117.82
Levallised Tariff	7.08	Rs/Unit																									

Determination of Additional Depreciation for Solar PV Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	21.342%
Income Tax (Normal Rates)	34.608%
Capital Cost	605.85

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Book Depreciation	%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	31.99	31.99	31.99	31.99	31.99	31.99	31.99	31.99	31.99	31.99	31.99	31.99	31.99	31.99	31.99	31.99	31.99	31.99	1.45	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	100%	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%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	0.0%	0.0%	0.0%	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%	0.00%	0.00%	0.00%	0.00%
Accelerated Depm.	Rs Lakh	605.85	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	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	573.86	-31.99	-31.99	-31.99	-31.99	-31.99	-31.99	-31.99	-31.99	-31.99	-31.99	-31.99	-31.99	-31.99	-31.99	-31.99	-31.99	-31.99	-1.45	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	198.60	-11.07	-11.07	-11.07	-11.07	-11.07	-11.07	-11.07	-11.07	-11.07	-11.07	-11.07	-11.07	-11.07	-11.07	-11.07	-11.07	-11.07	-0.50	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	0.83	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Per unit benefit	Rs/Unit	23.86	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.03	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09
Applicable Discounting Factor		1.00	0.95	0.86	0.77	0.70	0.63	0.57	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.12	0.11	0.10	0.09

Levellised benefit	0.71	Rs/Unit
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Annexure – 5B
(Solar Thermal Projects)

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Auptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	23.0%	
			Auxiliary Consumption Factor	%	10.0%	
			Life of Power Plant	Years	25	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	1200	
3	Sources of Fund		Tariff Period	Years	25	
			Debt: Equity			
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	840	
			Total Equity Amout	Rs Lacs	360	
			Funding Options-1 (Domestic Loan Source-1)			
			Loan Amount	Rs Lacs	840	
			Moratorium Period	years	0	
			Repayment Period(incld Moratorium)	years	12	
			Intrest Rate	%	13.00%	
			Funding Options-2 (Equity Finance)			
			Equity amount	Rs Lacs	360	
			Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.34%	
RoE Period	Year	10				
Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.47%				
Weighted average of ROE		22.82%				
Discount Rate		10.75%				
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	34.61%	
			MAT Rate (for first 10 years)	%	21.34%	
			80 IA benefits	Yes/No	Yes	
			Depreciation			
			Depreciation Rate for first 12 years	%	5.83%	
			Depreciation Rate 13th year onwards	%	1.54%	
Years for 5.83% rate		12				
5	Working Capital		For Fixed Charges			
			O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			For Variable Charges			
Intrest On Working Capital	%	13.50%				
7	Operation & Maintenance		power plant	1% of base capital cost	Rs Lakh	15
			Total O & M Expenses Escalation		%	5.72%

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MJ		1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		15.00	15.86	16.77	17.72	18.74	19.81	20.94	22.14	23.41	24.75	26.16	27.66	29.24	30.91	32.68	34.55	36.53	38.62	40.82	43.16	45.63	48.24	51.00	53.91	57.00
Depreciation	Rs Lakh		70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	18.46	18.46	18.46	18.46	18.46	18.46	18.46	18.46	18.46	18.46	18.46	18.46	18.46
Interest on term loan	Rs Lakh		104.65	95.55	86.45	77.35	68.25	59.15	50.05	40.95	31.85	22.75	13.65	4.55	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
Interest on working Capital	Rs Lakh		5.39	5.41	5.44	5.47	5.51	5.54	5.57	5.61	5.65	5.69	5.74	5.79	5.84	5.89	5.94	6.00	6.07	6.13	6.20	6.27	6.35	6.43	6.52	6.61	6.71
Return on Equity	Rs Lakh		73.23	73.23	73.23	73.23	73.23	73.23	73.23	73.23	73.23	73.23	88.08	88.08	88.08	88.08	88.08	88.08	88.08	88.08	88.08	88.08	88.08	88.08	88.08	88.08	88.08
Total Fixed Cost	Rs Lakh		268.27	260.05	251.89	243.78	235.72	227.73	219.80	211.93	204.14	196.42	203.63	196.08	141.62	143.35	145.17	147.10	149.14	151.29	153.57	155.98	158.53	161.22	164.06	167.07	170.25
Per unit Fixed Cost	Rs/kWh		14.79	14.34	13.89	13.44	13.00	12.56	12.12	11.69	11.26	10.83	11.23	10.81	7.81	7.91	8.01	8.11	8.22	8.34	8.47	8.60	8.74	8.89	9.05	9.21	9.39

Levellised COG

Per Unit Cost of Generation	Unit	Levellised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh	1.23	0.83	0.87	0.92	0.98	1.03	1.09	1.15	1.22	1.29	1.36	1.44	1.53	1.61	1.70	1.80	1.91	2.01	2.13	2.25	2.38	2.52	2.66	2.81	2.97	3.14
Depreciation	Rs/kWh	3.32	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Int. on term loan	Rs/kWh	2.93	5.77	5.27	4.77	4.27	3.76	3.26	2.76	2.26	1.76	1.25	0.75	0.25	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
Int. on working capital	Rs/kWh	0.31	0.30	0.30	0.30	0.30	0.31	0.31	0.31	0.31	0.31	0.31	0.32	0.32	0.32	0.32	0.33	0.33	0.33	0.34	0.34	0.35	0.35	0.35	0.36	0.36	0.37
RoE	Rs/kWh	4.26	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86
Total COG	Rs/kWh	12.05	14.79	14.34	13.89	13.44	13.00	12.56	12.12	11.69	11.26	10.83	11.23	10.81	7.81	7.91	8.01	8.11	8.22	8.34	8.47	8.60	8.74	8.89	9.05	9.21	9.39

Levellised

Fixed Cost	12.05	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45	218.45
Total COG	12.05																										

Determination of Additional Depreciation for Solar Thermal Projects

Depreciation amount	90%
Normal Tax Depreciation Rate	7.69%
Book Depreciation Rate	5.28%
Tax Depreciation Rate	80%
Additional Depreciation	20%
Corporate Tax Rate	34.61%
MAT Rate	21.342%
Capital Cost	1200.00
Levelisation period for acc. Dep.	25

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Book Depreciation	%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs. Lakh	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	2.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cummulative Depreciation	Rs. Lakh	63.36	126.72	190.08	253.44	316.80	380.16	443.52	506.88	570.24	633.60	696.96	760.32	823.68	887.04	950.40	1013.76	1077.12	1080.00	1080.00	1080.00	1080.00	1080.00	1080.00	1080.00	1080.00

Accelerated Depreciation

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Opening		100%	0%	0%	0%	0.00%	0.00%	0.00%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year		100%	0%	0%	0%	0.00%	0.00%	0.00%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Closing		0%	0%	0%	0.00%	0.00%	0.00%	0.00%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Accelerated Depreciation	Rs. Lakh	1200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Net Depreciation	Rs. Lakh	1136.64	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-2.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs. Lakh	393.37	-21.93	-21.93	-21.93	-21.93	-21.93	-21.93	-21.93	-21.93	-21.93	-21.93	-21.93	-21.93	-21.93	-21.93	-21.93	-21.93	-1.00	0.00	-	-	-	-	-	-
Energy Generation	MU	0.91	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
Per Unit Tax Benefit	Rs./kWh	43.39	-1.21	-1.21	-1.21	-1.21	-1.21	-1.21	-1.21	-1.21	-1.21	-1.21	-1.21	-1.21	-1.21	-1.21	-1.21	-1.21	-0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discount factor		1	0.90	0.82	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.29	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09

Net Tax benefit (Rs./kWh) 1.40