

**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 remaining Tariff**  
**Review Period of FY 2015-16 (1 January to 31 March, 2016)**

**Coram**

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

**DRAFT ORDER**

**Dated: 1 December, 2015**

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 the Generic Tariff for the RE technologies for which norms have been specified in the Regulations on suo moto basis:

*“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 has 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. The Commission has notified its RE Tariff Regulations, 2015 on 10 November, 2015. Accordingly, the Commission, in discharge of the mandate under Regulation 9.1 of RE Tariff Regulations, 2015, proposes to determine the Generic Tariff for RE Technologies for the remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016), in accordance with this draft Order, and has invited public comments, objections and suggestions.

## **1. 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.

### **1.1. 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, considering that Regulation 6.1 provides that the first year of the Review Period shall commence from the date of notification of these Regulations.

## **1.2. 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.

## **1.3. 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.”*

## **1.4. 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 1<sup>st</sup> April of every year shall be worked out by deducting the cumulative repayment up to 31<sup>st</sup> 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:

<b>Period</b>	<b>Base Rate (%)</b>	<b>Period (no of days)</b>
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 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.

## **1.5. 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.

## **1.6. 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 10.81 %, 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. 1.4 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 22.64% (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  $10.81\% = ((13.00\% \times 0.70 \times (1 - 33.99\%)) + (16.00\% \times 0.30))$

## **1.7. 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 installments 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 the Projects availing the benefit of accelerated depreciation as per the applicable Income Tax rate of 33.99% (30% Income Tax rate + 10% 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, except in case of Wind Energy Projects wherein, as per the Income Tax (Fourth Amendment Rules), 2012, depreciation is now restricted to 15% for windmills installed after 31 March, 2012 vide Notification No. 15/2012 [F.No.149/21/2010-SO(TPL)] S.O.694(E), dated 30 March, 2012. 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 50% of 80% or 15%, as the case may be, and 50% of the additional depreciation of 20%, assuming the Project to be capitalized during the second half of the financial year as per the second proviso to Regulation 22.1. 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.

## **1.8. 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.

## **1.9. APPLICABILITY OF TARIFF ORDER**

This Tariff Order shall be applicable for New RE Projects to be commissioned during the remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016).

In case of Biomass-based Power Projects and Non-Fossil fuel-based Co-generation Power Projects commissioned on or prior to 31 December, 2015, the Variable Charge component of the Tariff for the remaining period of FY 2015-16 (1 January to 31 March, 2016) shall be determined as outlined under 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 Tariff for New RE Projects to be commissioned from 1 January to 31 March, 2016 based on various Renewable Energy technologies.

## **2. WIND ENERGY PROJECTS**

### **2.1. USEFUL LIFE**

Regulation 2.1 (mm) of the RE Tariff Regulations, 2015 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.

### **2.2. 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.

### 2.3. 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/m<sup>2</sup>)</i>	<i>CUF</i>
<i>Zone 1</i>	<i>&lt;=250</i>	<i>22%</i>
<i>Zone 2</i>	<i>&gt;250 - &lt;=300</i>	<i>25%</i>
<i>Zone 3</i>	<i>&gt;300 - &lt;=400</i>	<i>30%</i>
<i>Zone 4</i>	<i>&gt;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. the Maharashtra Energy Development Agency (MEDA) shall refer to the State-wise wind power density map prepared by the National Institute for Wind Energy (NIWE).

### 2.4. CAPITAL COST

The Capital Cost for Wind Energy Projects shall include the cost of Wind Turbine Generator, 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 in the remaining part of the first year of the Review Period (i.e. 1 January to 31 March, 2016) for the purpose of Tariff determination.

### 2.5. 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, for FY 2015-16.



## 2.6. 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 FY 2015-16 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 20.96% (Rs lakh per MW)	36.48
Return on Equity after first 10 years @16% grossing up with Income Tax rate of 33.99% (Rs lakh per MW)	43.68

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

## 2.7. INTEREST ON LOAN

As explained in para. 1.4 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 in FY 2015-16.

## 2.8. 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 13<sup>th</sup> 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.

## 2.9. 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. 1.5, 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. 1.4 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 in the remaining period of FY 2015-16 works out to 13.50% (10.00% + 350 basis points).

## **2.10. OPERATION AND MAINTENANCE (O&M) EXPENSES**

Regulation 29 of the RE Tariff Regulations, 2015 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 remaining period of FY 2015-16 (1 January to 31 March, 2016)..

## **2.11. LEVELISED TARIFF FOR NEW WIND ENERGY PROJECTS FROM 1 JANUARY TO 31 MARCH, 2016**

Accordingly, the Generic Tariffs for Wind Energy Projects in the period from 1 January to 31 March, 2016 have been determined as follows. The discount factor for levelisation of Tariff for Wind Energy Projects works out to 10.81% as computed in para 1.6 of this Order.

### **Tariff for New Wind Energy Projects for the remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016)**

<b>Wind Energy</b>	<b>Tariff Period</b>	<b>Levelised Tariff from 1 January to 31 March, 2016</b>	<b>Benefits of Tax and Additional Depreciation</b>	<b>Net Levelised Tariff, adjusting for Tax and Additional Depreciation Benefit</b>
		<b>Rs/kWh</b>	<b>(if availed)</b>	<b>(if availed)</b>
		<b>Rs/kWh</b>	<b>Rs/kWh</b>	<b>Rs/kWh</b>
<b>Wind Zone-1</b>	13	5.70	0.62	5.07
<b>Wind Zone-2</b>	13	5.01	0.55	4.47
<b>Wind Zone-3</b>	13	4.18	0.46	3.72
<b>Wind Zone-4</b>	13	3.92	0.43	3.49

**Notes:**

- The above Tariff shall be valid for Projects commissioned during the period from 1 January 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.

### **3. SMALL HYDRO POWER PROJECTS AND MINI/MICRO HYDRO PROJECTS**

#### **3.1. 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.

#### **3.2. 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.

#### **3.3. 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 remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016) as below:

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

### 3.4. 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.

### 3.5. RETURN ON EQUITY

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

<b>Particulars</b>	<b>&gt; 1 MW and up to and including 5 MW</b>	<b>&gt; 5 MW and up to and including 25 MW</b>
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 20.96% (Rs lakh per MW)	36.76	33.44
Return on Equity after first 10 years @16% grossing up with Income Tax rate of 33.99% (Rs lakh per MW)	44.01	40.04

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

### 3.6. INTEREST ON LOAN

As explained in Para. 1.4 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 remaining period of FY 2015-16.

### 3.7. 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.

### 3.8. INTEREST ON WORKING CAPITAL

Regulation 18.1 of the RE Tariff Regulations provides for computation of the working capital requirements of the 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. 1.5 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).

### 3.9. 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 period from 1 January to 31 March of FY 2015-16:

<b>Project Size</b>	<b>O&amp;M Expenses (Rs lakh/MW)</b>
> 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.

### 3.10. 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.

### 3.11. AUXILIARY POWER CONSUMPTION

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

### 3.12. INCENTIVE FOR MINI/MICRO HYDRO PROJECTS

The RE Tariff Regulations provide for a higher Tariff for Mini/Micro hydro Projects over the other SHP Projects, as below:

*“35.1 The tariff for Mini Hydro Power Projects of 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.*

*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.

### 3.13. LEVELISED TARIFF FOR NEW SMALL HYDRO PROJECTS FROM 1 JANUARY TO 31 MARCH, 2016

Considering the above parameters and the discount factor worked out as 10.81% (as computed at para 1.6 of this Order) for levelisation of Tariff for SHP, the Generic Tariffs for SHPs during the period from 1 January to 31 March, 2016 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 1 January 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)
<b>Mini and Micro Hydro Projects</b>				
500 and below	35	6.11	0.44	5.67
Above 500 kW and up to and including 1 MW	35	5.61	0.44	5.17
<b>Other SHPs</b>				
Above 1 MW and up to and including 5 MW	35	5.11	0.44	4.67
Above 5 MW and upto and including 25 MW	13	4.34	0.40	3.94

*Notes:*

- The above Tariffs shall be valid for Projects commissioned during the period from 1 January 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 (5MW to 25 MW) are provided in Annexures 2A and 2B of this Order, respectively.

## 4. BIOMASS-BASED POWER PROJECTS

### 4.1. 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 RE Tariff Regulations specifies biomass fuel price as Rs. 3987 /MT during the first year of Review Period, i.e. FY 2015-16, and shall thereafter be 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,*

*VC<sub>1</sub> represents the Variable Charge based on Biomass Price P<sub>1</sub> for FY 2015-16 as specified under Regulation 49, and shall be determined as under:*

$$VC_1 = \frac{\text{Station Heat Rate (SHR)}}{\text{Gross Calorific Value (GCV)}} \times \frac{1}{(1 - \text{Auxiliary Consumption Factor})} \times \frac{P_1}{1000}$$

*P<sub>(n)</sub> = Price per tonne of biomass for the n<sup>th</sup> year to be considered for tariff determination*

$P_{(n-1)}$  = Price per tonne of biomass for the (n-1)<sup>th</sup> year to be considered for tariff determination.  $P_1$  shall be the Biomass price for FY 2015-16 as specified under Regulation 49.”

Accordingly, in case of Biomass-based Power Projects commissioned on or prior to 31 December, 2015, the Variable Charge component of the Tariff for FY 2015-16 shall be determined as outlined under Para 4.15 of this Order. The Fixed Charge component of the Tariff shall continue to be governed by the relevant Orders issued by the Commission.

#### **4.2. 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.

#### **4.3. DEBT-EQUITY RATIO**

In accordance with Regulation 14.1, the debt and equity components for Biomass-based Power Projects to be commissioned in FY 2015-16 works out to Rs. 346.02 lakh per MW and Rs. 148.30 lakh per MW, respectively.

#### **4.4. RETURN ON EQUITY**

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

<b>Particulars</b>	<b>Biomass-based Projects</b>
Opening Equity (in Rs lakh per MW)	148.30
Return on Equity for the first 10 years @16% grossing up with MAT rate of 20.96% (Rs lakh per MW)	30.02
Return on Equity after first 10 years @16% grossing up with Income Tax rate of 33.99% (Rs lakh per MW)	35.95

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

#### **4.5. INTEREST ON LOAN**

As explained in Para. 1.4 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 remaining period of FY 2015-16 (1 January to 31 March, 2016), with a gross opening loan amount of Rs. 346.02 lakh per MW in FY 2015-16.



#### **4.6. 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.

#### **4.7. 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. 1.5, 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).

#### **4.8. 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 2<sup>nd</sup> Year onwards: 80%.

#### **4.9. 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.

#### **4.10. STATION HEAT RATE**

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

#### **4.11. 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.

#### **4.12. 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.

#### **4.13. 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 1 January, 2016 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 1 January 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%.

#### **4.14. VARIABLE CHARGE FOR BIOMASS-BASED POWER PROJECTS COMMISSIONED PRIOR TO 1 JANUARY, 2016**

In its Order dated 7 July, 2014 in Case No. 100 of 2014, the Commission had determined the Variable Charge for Biomass-based Projects for FY 2014-15 as Rs. 4.36 per kWh considering Biomass fuel price of Rs 3730.74/MT. Considering the Biomass fuel price of Rs 3987/MT during FY 2015-16 as set out above, the Commission is revising the Variable Charge of Projects commissioned during FY 2013-14, FY 2014-15 and FY 2015-16 (upto 31 December, 2015) to Rs. 4.66 per kWh (i.e., Rs. 4.36/kWh x Rs. 3987 per MT/ Rs. 3730.74 per MT) for the period 1 January to 31 March, 2016.

In accordance with 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. 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, the norms in respect of SHR, GCV

and Auxiliary Consumption Factor for such Projects commissioned prior to FY 2013-14 shall be as stipulated under the respective Tariff Orders.

In view of the above, SHR and GCV for Biomass-based Power Projects commissioned prior to FY 2013-14 shall be governed as per the terms and conditions of the relevant biomass Tariff Orders (i.e. in Case Nos. 37 of 2003 and. 83 of 2008). Accordingly, the Commission has considered the GCV as 3200 kCal/kg and SHR as 3650 kCal/kWh for Projects commissioned prior to FY 2013-14. Based on these parameters along with the revised fuel price applicable for FY 2015-16 of Rs 3987 per MT, the variable cost of the Projects commissioned prior to FY 2013-14 works out to Rs 5.05/kWh, in accordance with Regulation 50.1 of the RE Tariff Regulations.

Considering the above parameters and the discount factor worked out as 10.81% (as computed at para 1.6 of this Order) for levelisation of Tariff, the Generic Tariffs for Biomass-based Power Projects for FY 2015-16 have been determined in the Table below.

The Fixed Charge component of the Tariff for Biomass-based Power Projects commissioned during FY 2013-14 and FY 2014-15 shall be the levelised Fixed Charge approved under the RE Tariff Orders issued in Case Nos. 6 of 2013 and 100 of 2014, respectively. Biomass-based Power Projects commissioned prior to FY 2013-14 shall be governed by the Commission's Orders in Case Nos. 37 of 2003 and 83 of 2008.

#### **4.15. LEVELISED TARIFF FOR BIOMASS BASED POWER PROJECTS FROM 1 JANUARY TO 31 MARCH, 2016**

##### **Tariff for Biomass-based Power Projects**

<b>Date of Commissioning of Project</b>	<b>Fixed Charge (Rs/kWh)</b>	<b>Variable Charge (Rs/kWh)</b>	<b>Tariff during 1 January to 31 March, 2016 (Rs/kWh)</b>	<b>Benefit of Accelerated Depreciation (if availed) (Rs/kWh)</b>	<b>Net Levelised Tariff (upon adjusting for accelerated depreciation benefit, if availed) (Rs/kWh)</b>
<b>During FY 2015-16 (1 January to 31 March, 2016)</b>	2.35	5.15	7.50	0.17	7.33
<b>During FY 2015-16 (1 April to 31 December, 2015)</b>	2.27*	4.66	6.93	0.17	6.76

Date of Commissioning of Project	Fixed Charge (Rs/kWh)	Variable Charge (Rs/kWh)	Tariff during 1 January 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 2014-15	2.27*	4.66	6.93	0.17	6.76
During FY 2013-14	2.17#	4.66	6.83	0.17	6.66
Prior to FY 2013-14	1.70**	5.05	6.75	NA	6.75

\* 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 remaining Tariff Review Period of FY 2015-16 (1 January 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 remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016).

## 5. NON-FOSSIL FUEL-BASED CO-GENERATION PROJECTS

### 5.1. 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,*

*VC<sub>1</sub> represents the Variable Charge based on Bagasse Price P<sub>1</sub> for FY 2015-16 as specified under Regulation 60, and shall be determined as under:*

$$VC_1 = \frac{\text{Station Heat Rate (SHR)}}{\text{Gross Calorific Value (GCV)}} \times \frac{1}{(1 - \text{Auxiliary Consumption Factor})} \times \frac{P_1}{1000}$$

*P<sub>(n)</sub> = Price per tonne of Bagasse for the n<sup>th</sup> year to be considered for tariff determination*

*P<sub>(n-1)</sub> = Price per tonne of Bagasse for the (n-1)<sup>th</sup> year to be considered for tariff determination. P<sub>1</sub> 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 remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016) shall be determined as per para 5.15 of this Order. The, Fixed Charge component shall continue to be governed by the relevant Orders issued by the Commission.

## **5.2. 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 remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016) is considered as Rs 489.02 Lakh per MW

### 5.3. DEBT-EQUITY RATIO

In accordance with Regulation 14.1, the debt and equity components for the remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016) work out to Rs. 342.31 lakh per MW and Rs. 146.71 lakh per MW, respectively.

### 5.4. 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 20.96% (Rs lakh per MW)	29.70
Return on Equity after first 10 years @16% grossing up with Income Tax rate of 33.99% (Rs lakh per MW)	35.56

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

### 5.5. INTEREST ON LOAN

As explained in para. 1.4 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.

### 5.6. 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.

### 5.7. INTEREST ON WORKING CAPITAL

Regulation 18 of the RE Tariff Regulations provides for computation of the working capital requirements of the Non-fossil fuel-based Co-Generation 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. 1.5, 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. 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 remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016) has been considered as Rs. 17.31 lakh per MW.

#### **5.9. 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.

#### **5.10. AUXILIARY POWER CONSUMPTION**

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

#### **5.11. STATION HEAT RATE**

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

#### **5.12. CALORIFIC VALUE**

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

#### **5.13. FUEL COST**

Regulation 60.1 specifies the Bagasse fuel price during first year of the Review Period, i.e. FY 2015-16, as Rs. 2326.84/MT, which is linked to the indexation mechanism as specified under Regulation 61. Accordingly, the Commission considers the fuel cost for Non-Fossil fuel-based Co-Generation Projects to be commissioned in the remaining Tariff Review Period of FY 2015-16 (1 January 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 the period from 1 January to 31 March, 2016, 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%.

#### **5.14. VARIABLE CHARGE FOR BAGASSE-BASED CO-GENERATION POWER PROJECTS COMMISSIONED PRIOR TO 1 JANUARY, 2016**

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 upto 31 December, 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 1 January to 31 March, 2016.

#### **5.15. LEVELISED TARIFF FOR NON-FOSSIL FUEL-BASED CO-GENERATION PROJECTS FROM 1 JANUARY TO 31 MARCH, 2016**

Considering the above parameters and the discount factor as 10.81% (as computed at para 1.6 of this Order) for levelisation of Tariff of Non-Fossil fuel-based Co-Generation Projects commissioned in the remaining Tariff Review Period of FY 2015-16 (1 January 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 1 JANUARY TO 31 MARCH, 2016**

<b>Date of Commissioning</b>	<b>Fixed Charge (Rs/kWh)</b>	<b>Variable Charge (Rs/kWh)</b>	<b>Tariff (Rs/kWh)</b>	<b>Benefit of Accelerated Depreciation (if availed) (Rs/kWh)</b>	<b>Net Levelised Tariff (upon adjusting for accelerated depreciation benefit, if availed) (Rs/kWh)</b>
<b>During FY 2015-16 (1 January to 31 March, 2016)</b>	2.51	4.07	6.58	0.22	6.36
<b>During FY 2015-16 (1 April to 31 December, 2015)</b>	2.46*	4.07	6.53	0.22	6.31
<b>During FY 2014-15</b>	2.46*	4.07	6.53	0.22	6.31



<b>Date of Commissioning</b>	<b>Fixed Charge (Rs/kWh)</b>	<b>Variable Charge (Rs/kWh)</b>	<b>Tariff (Rs/kWh)</b>	<b>Benefit of Accelerated Depreciation (if availed) (Rs/kWh)</b>	<b>Net Levelised Tariff (upon adjusting for accelerated depreciation benefit, if availed) (Rs/kWh)</b>
<b>During FY 2013-14</b>	2.38#	4.07	6.45	0.22	6.23
<b>Prior to FY 2013-14</b>	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 (1 January 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 and FY 2014-15 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 during the remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016).

## **5.16. TARIFF FOR NON-QUALIFYING NON-FOSSIL FUEL-BASED CO-GENERATION PLANTS**

The Tariff of Non-Qualifying Non-Fossil fuel-based Co-Generation (NQNFCC) Projects will be equivalent to the Average Power Purchase Cost (APPC) of the respective Distribution Licensees for the remaining Tariff Review Period of FY 2015-16 (1 January, 2016 to 31 March, 2016) in accordance with the provisions of Regulations 67 of the RE Tariff Regulations, 2015.

## **6. SOLAR PHOTO VOLTAIC PROJECTS**

### **6.1. 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.

## **6.2. CONTROL PERIOD**

The Control Period for Solar PV Projects shall be in accordance with the relevant stipulations at para 1.1 of this Order.

## **6.3. 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.

## **6.4. 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 remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016).

## **6.5. 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.

## **6.6. RETURN ON EQUITY**

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

<b>Particulars</b>	<b>Solar PV Projects</b>
Opening Equity (in Rs lakh per MW)	181.76
Return on Equity for the first 10 years @16% grossing up with MAT rate of 20.96% (Rs lakh per MW)	36.79
Return on Equity after first 10 years @16% grossing up with Income Tax rate of 33.99% (Rs lakh per MW)	44.06

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

## **6.7. INTEREST ON LOAN**

As explained in Para. 1.4 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 remaining period of FY 2015-16.

## **6.8. 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.

## **6.9. 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. 1.5 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).

## **6.10. 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 1 January to 31 March, 2016 of FY 2015-16 has been considered as Rs. 13.00 lakh per MW.

## **6.11. CAPACITY UTILISATION FACTOR**

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

**6.12. LEVELISED TARIFF FOR SOLAR PV POWER PROJECTS COMMISSIONED FROM 1 JANUARY TO 31 MARCH, 2016**

Considering the parameters discussed in the preceding paras. and with respect to the discount factor of 10.81% derived based on the methodology in para. 1.6 of this Order, the Generic Tariffs for Solar PV Projects commissioned during the period from 1 November, 2015 to 31 March, 2016 have been determined as under:

<b>Tariff for New Solar PV Power Projects</b>				
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	7.07	0.73	6.34

Note :- Detailed computations of Tariff for the remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016) for new Solar Power PV Projects are provided in Annexure 5A of this Order.

**6.13. LEVELISED TARIFF FOR SOLAR ROOF-TOP PV PROJECTS FROM 1 JANUARY 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 1 January to 31 March, 2016 shall be as follows:

## Tariff for New Solar Roof-top PV Power Projects

Particular	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	7.57	0.73	6.84

## 7. SOLAR THERMAL POWER 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 Thermal Power Projects is 25 years.

### 7.2. CONTROL PERIOD

The Control Period for Solar Thermal Power Projects shall be in accordance with the relevant stipulations in para 1.1 of this Order.

### 7.3. 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.

### 7.4. 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 is considering the same for the Projects to be commissioned in the remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016).

## 7.5. 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.

## 7.6. 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 20.96% (Rs lakh per MW)	72.87
Return on Equity after first 10 years @16% grossing up with Income Tax rate of 33.99% (Rs lakh per MW)	87.26

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

## 7.7. INTEREST ON LOAN

As explained in Para. 1.4 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 in the remaining period of FY 2015-16 (1 January 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.

## 7.9. 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. 1.5, 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).

#### **7.10. 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 Regulations of the Commission 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 period of FY 2015-16 (1 January to 31 March, 2016) has been considered as Rs. 15.00 lakh per MW.

#### **7.11. CAPACITY UTILISATION FACTOR**

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

#### **7.12. LEVELISED TARIFF FOR SOLAR THERMAL POWER PROJECTS COMMISSIONED FROM 1 JANUARY TO 31 MARCH, 2016**

Considering the parameters discussed in the preceding paras. and with respect to the discount factor of 10.81% derived based on the methodology in para. 1.6 of this Order, the Generic Tariff for Solar Thermal Power Projects commissioned between 1 January and 31 March, 2016 has been determined as under:

<b>Tariff for New Solar Thermal Power Projects</b>				
<b>Particulars</b>	<b>Tariff Period (Years)</b>	<b>Levelised Tariff</b>	<b>Benefit of Accelerated Depreciation (if availed)</b>	<b>Net Levelised Tariff (upon adjusting for Accelerated Depreciation benefit, if availed)</b>
		<b>(Rs/kWh)</b>	<b>(Rs/kWh)</b>	<b>(Rs/kWh)</b>
Solar Thermal Power Projects	25	12.03	0.93	11.09

Note :- Detailed computations of Tariff for the remaining Tariff Review Period of FY 2015-16 (1 January to 31 March, 2016) for new Solar Power PV Projects are provided in Annexure 5B of this Order.

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

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

9. Comments, suggestions and objections from the public and stake-holders, including RE Developers, Distribution Licensees, MEDA, electricity consumers, etc. are invited on this draft *suo moto* Order, following consideration of which the Commission will issue the final Order.

**Sd/-**  
**(Deepak Lad)**  
**Member**

**Sd/-**  
**(Azeez M. Khan)**  
**Member**



## 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	<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 Amout	Rs Lacs	180.22
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	420.52
			Repayment Period(incld 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	20.24%
RoE Period	Year	10.00			
Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.24%			
Weighted average of ROE		23%			
Discount Rate		10.81%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.99%
			MAT Rate (for first 10 years)	%	20.96%
			<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 &amp; M Expenses Escalation</u>	%	5.72%

**Form 1.2 Form Template for (Wind Power Projects under Zone - 1 : 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	2.76	2.78	2.80	2.82	2.84	2.86	2.88	2.90	2.93	2.96	2.98	3.01	3.04	3.08	3.11	3.15	3.19	3.23	3.27	3.32	3.37	3.42	3.47	3.53
Return on Equity	Rs Lakh		36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>		<b>135.49</b>	<b>131.46</b>	<b>127.46</b>	<b>123.48</b>	<b>119.54</b>	<b>115.64</b>	<b>111.77</b>	<b>107.94</b>	<b>104.16</b>	<b>100.41</b>	<b>103.92</b>	<b>100.27</b>	<b>73.15</b>	<b>74.17</b>	<b>75.24</b>	<b>76.38</b>	<b>77.58</b>	<b>78.85</b>	<b>80.19</b>	<b>81.61</b>	<b>83.11</b>	<b>84.69</b>	<b>86.37</b>	<b>88.14</b>	<b>90.01</b>
<b>Per unit Fixed Cost</b>	<b>Rs/kWh</b>	<b>5.70</b>	7.03	6.82	6.61	6.41	6.20	6.00	5.80	5.60	5.40	5.21	5.39	5.20	3.80	3.85	3.90	3.96	4.03	4.09	4.16	4.23	4.31	4.39	4.48	4.57	4.67

**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	<b>0.73</b>	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	<b>1.51</b>	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	<b>1.30</b>	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	<b>0.15</b>	0.14	0.14	0.14	0.15	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	0.17	0.17	0.17	0.17	0.17	0.18	0.18	0.18
RoE	Rs/kWh	<b>2.01</b>	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27
<b>Total COG</b>	<b>Rs/kWh</b>	<b>5.70</b>	<b>7.03</b>	<b>6.82</b>	<b>6.61</b>	<b>6.41</b>	<b>6.20</b>	<b>6.00</b>	<b>5.80</b>	<b>5.60</b>	<b>5.40</b>	<b>5.21</b>	<b>5.39</b>	<b>5.20</b>	<b>3.80</b>	<b>3.85</b>	<b>3.90</b>	<b>3.96</b>	<b>4.03</b>	<b>4.09</b>	<b>4.16</b>	<b>4.23</b>	<b>4.31</b>	<b>4.39</b>	<b>4.48</b>	<b>4.57</b>	<b>4.67</b>

**COG excl. RoE**

Discount Factor			1	0.90	0.81	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.10	0.09	0.09	
Fixed Cost	5.70		109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81
<b>Levelling Tariff</b>	<b>5.70</b>	<b>Rs/Unit</b>																										

**Determination of Additional Depreciation for Wind Power Projects**

Depreciation amount	90%			
Book Depreciation rate	5.28%	5.70	0.62	5.07
Tax Depreciation rate	80%			
Additional Depreciation	20%			
Income Tax (MAT)	20.960%			
Income Tax (Normal Rates)	33.990%			
Capital Cost	600.74	526.5		

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	%	2.64%	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%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	15.86	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	17.30	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	584.88	-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	-17.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	198.80	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-5.88	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	20.63	-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	-0.56	-0.56	-0.56	-0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.90	0.81	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.10	0.09	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	0.20	0.18	0.17	0.15	0.14	0.12	0.11	0.10	0.09

Levellised benefit	0.62	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	2
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	25.0%
			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	20.24%
RoE Period	Year	10.00			
Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.24%			
Weighted average of ROE		23%			
Discount Rate		10.81%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.99%
			MAT Rate (for first 10 years)	%	20.96%
			<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 &amp; M Expenses Escalation</u>	%	5.72%

**Form 1.2 Form Template for (Wind Power Projects under Zone - 2 : 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	2.76	2.78	2.80	2.82	2.84	2.86	2.88	2.90	2.93	2.96	2.98	3.01	3.04	3.08	3.11	3.15	3.19	3.23	3.27	3.32	3.37	3.42	3.47	3.53
Return on Equity	Rs Lakh		36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>		<b>135.49</b>	<b>131.46</b>	<b>127.46</b>	<b>123.48</b>	<b>119.54</b>	<b>115.64</b>	<b>111.77</b>	<b>107.94</b>	<b>104.16</b>	<b>100.41</b>	<b>103.92</b>	<b>100.27</b>	<b>73.15</b>	<b>74.17</b>	<b>75.24</b>	<b>76.38</b>	<b>77.58</b>	<b>78.85</b>	<b>80.19</b>	<b>81.61</b>	<b>83.11</b>	<b>84.69</b>	<b>86.37</b>	<b>88.14</b>	<b>90.01</b>
<b>Per unit Fixed Cost</b>	<b>Rs/kWh</b>	<b>5.01</b>	6.19	6.00	5.82	5.64	5.46	5.28	5.10	4.93	4.76	4.59	4.75	4.58	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

**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	<b>0.64</b>	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	<b>1.33</b>	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	<b>1.15</b>	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	<b>0.13</b>	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	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16
RoE	Rs/kWh	<b>1.77</b>	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
<b>Total COG</b>	<b>Rs/kWh</b>	<b>5.01</b>	<b>6.19</b>	<b>6.00</b>	<b>5.82</b>	<b>5.64</b>	<b>5.46</b>	<b>5.28</b>	<b>5.10</b>	<b>4.93</b>	<b>4.76</b>	<b>4.59</b>	<b>4.75</b>	<b>4.58</b>	<b>3.34</b>	<b>3.39</b>	<b>3.44</b>	<b>3.49</b>	<b>3.54</b>	<b>3.60</b>	<b>3.66</b>	<b>3.73</b>	<b>3.79</b>	<b>3.87</b>	<b>3.94</b>	<b>4.02</b>	<b>4.11</b>

**COG excl. RoE**

Discount Factor			1	0.90	0.81	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.10	0.09	0.09
Fixed Cost	5.01		109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81
<b>Levelised Tariff</b>	<b>5.01</b>	<b>Rs/Unit</b>																									

**Determination of Additional Depreciation for Wind Power Projects**

Depreciation amount	90%			
Book Depreciation rate	5.28%	5.01	0.55	4.47
Tax Depreciation rate	80%			
Additional Depreciation	20%			
Income Tax (MAT)	20.960%			
Income Tax (Normal Rates)	33.990%			
Capital Cost	600.74	526.5		

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	%	2.64%	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%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	15.86	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	17.30	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	584.88	-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	-17.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	198.80	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-5.88	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	18.16	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.90	0.81	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.10	0.09	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	0.20	0.18	0.17	0.15	0.14	0.12	0.11	0.10	0.09

Levellised benefit	0.55	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	3
1	Power Generation	<u>Capacity</u>	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	30.0%
			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 Amout	Rs Lacs	180.22
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	420.52
			Repayment Period(inclد 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	20.24%
			RoE Period	Year	10.00
Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.24%			
Weighted average of ROE		23%			
Discount Rate		10.81%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.99%
			MAT Rate (for first 10 years)	%	20.96%
			<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	<u>power plant (FY15-16)</u>		Rs Lakh	8.83
			<u>Total O &amp; M Expenses Escalation</u>	%	5.72%

**Form 1.2 Form Template for (Wind Power Projects under Zone - 3 : 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	2.76	2.78	2.80	2.82	2.84	2.86	2.88	2.90	2.93	2.96	2.98	3.01	3.04	3.08	3.11	3.15	3.19	3.23	3.27	3.32	3.37	3.42	3.47	3.53
Return on Equity	Rs Lakh		36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>		<b>135.49</b>	<b>131.46</b>	<b>127.46</b>	<b>123.48</b>	<b>119.54</b>	<b>115.64</b>	<b>111.77</b>	<b>107.94</b>	<b>104.16</b>	<b>100.41</b>	<b>103.92</b>	<b>100.27</b>	<b>73.15</b>	<b>74.17</b>	<b>75.24</b>	<b>76.38</b>	<b>77.58</b>	<b>78.85</b>	<b>80.19</b>	<b>81.61</b>	<b>83.11</b>	<b>84.69</b>	<b>86.37</b>	<b>88.14</b>	<b>90.01</b>
<b>Per unit Fixed Cost</b>	<b>Rs/kWh</b>	<b>4.18</b>	5.16	5.00	4.85	4.70	4.55	4.40	4.25	4.11	3.96	3.82	3.95	3.82	2.78	2.82	2.86	2.91	2.95	3.00	3.05	3.11	3.16	3.22	3.29	3.35	3.43

**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	<b>0.53</b>	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	<b>1.10</b>	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	<b>0.96</b>	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	<b>0.11</b>	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	<b>1.47</b>	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	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
<b>Total COG</b>	<b>Rs/kWh</b>	<b>4.18</b>	<b>5.16</b>	<b>5.00</b>	<b>4.85</b>	<b>4.70</b>	<b>4.55</b>	<b>4.40</b>	<b>4.25</b>	<b>4.11</b>	<b>3.96</b>	<b>3.82</b>	<b>3.95</b>	<b>3.82</b>	<b>2.78</b>	<b>2.82</b>	<b>2.86</b>	<b>2.91</b>	<b>2.95</b>	<b>3.00</b>	<b>3.05</b>	<b>3.11</b>	<b>3.16</b>	<b>3.22</b>	<b>3.29</b>	<b>3.35</b>	<b>3.43</b>

**COG excl. RoE**

Discount Factor			1	0.90	0.81	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.10	0.09	0.09
Fixed Cost	4.18		109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81
<b>Levelised Tariff</b>	<b>4.18</b>	<b>Rs/Unit</b>																									



**Determination of Additional Depreciation for Wind Power Projects**

Depreciation amount	90%			
Book Depreciation rate	5.28%	4.18	0.46	3.72
Tax Depreciation rate	80%			
Additional Depreciation	20%			
Income Tax (MAT)	20.960%			
Income Tax (Normal Rates)	33.990%			
Capital Cost	600.74	526.5		

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	%	2.64%	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%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	15.86	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	17.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Accelerated Depreciation**

Opening	%	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%
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%
Closing	%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	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

Net Depreciation Benefit	Rs Lakh	584.88	-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	-17.30	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	198.80	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-5.88	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
Per unit benefit	Rs/Unit	15.13	-0.41	-0.41	-0.41	-0.41	-0.41	-0.41	-0.41	-0.41	-0.41	-0.41	-0.41	-0.41	-0.41	-0.41	-0.41	-0.41	-0.22	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.90	0.81	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	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	0.20	0.18	0.17	0.15	0.14	0.12	0.11	0.10

<b>Levellised benefit</b>	<b>0.46</b>	<b>Rs/Unit</b>
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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	4
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	32.0%
			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	20.24%
RoE Period	Year	10.00			
Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.24%			
Weighted average of ROE		23%			
Discount Rate		10.81%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.99%
			MAT Rate (for first 10 years)	%	20.96%
			<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 &amp; M Expenses Escalation</u>	%	5.72%

Form 1.2 Form Template for (Wind Power Projects under Zone - 4 : 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	2.76	2.78	2.80	2.82	2.84	2.86	2.88	2.90	2.93	2.96	2.98	3.01	3.04	3.08	3.11	3.15	3.19	3.23	3.27	3.32	3.37	3.42	3.47	3.53
Return on Equity	Rs Lakh		36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68	43.68
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>		<b>135.49</b>	<b>131.46</b>	<b>127.46</b>	<b>123.48</b>	<b>119.54</b>	<b>115.64</b>	<b>111.77</b>	<b>107.94</b>	<b>104.16</b>	<b>100.41</b>	<b>103.92</b>	<b>100.27</b>	<b>73.15</b>	<b>74.17</b>	<b>75.24</b>	<b>76.38</b>	<b>77.58</b>	<b>78.85</b>	<b>80.19</b>	<b>81.61</b>	<b>83.11</b>	<b>84.69</b>	<b>86.37</b>	<b>88.14</b>	<b>90.01</b>
<b>Per unit Fixed Cost</b>	<b>Rs/kWh</b>	<b>3.92</b>	4.83	4.69	4.55	4.41	4.26	4.13	3.99	3.85	3.72	3.58	3.71	3.58	2.61	2.65	2.68	2.72	2.77	2.81	2.86	2.91	2.96	3.02	3.08	3.14	3.21

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	<b>0.50</b>	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	<b>1.04</b>	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	<b>0.90</b>	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	<b>0.10</b>	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	<b>1.38</b>	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56
<b>Total COG</b>	<b>Rs/kWh</b>	<b>3.92</b>	<b>4.83</b>	<b>4.69</b>	<b>4.55</b>	<b>4.41</b>	<b>4.26</b>	<b>4.13</b>	<b>3.99</b>	<b>3.85</b>	<b>3.72</b>	<b>3.58</b>	<b>3.71</b>	<b>3.58</b>	<b>2.61</b>	<b>2.65</b>	<b>2.68</b>	<b>2.72</b>	<b>2.77</b>	<b>2.81</b>	<b>2.86</b>	<b>2.91</b>	<b>2.96</b>	<b>3.02</b>	<b>3.08</b>	<b>3.14</b>	<b>3.21</b>

COG excl. RoE

Discount Factor			1	0.90	0.81	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.10	0.09	0.09
Fixed Cost	3.92		109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81	109.81
<b>Levillised Tariff</b>	<b>3.92</b>	<b>Rs/Unit</b>																									

**Determination of Additional Depreciation for Wind Power Projects**

Depreciation amount	90%			
Book Depreciation rate	5.28%	3.92	0.43	3.49
Tax Depreciation rate	80%			
Additional Depreciation	20%			
Income Tax (MAT)	20.960%			
Income Tax (Normal Rates)	33.990%			
Capital Cost	600.74	526.5		

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	%	2.64%	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%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	15.86	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	17.30	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	584.88	-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	-17.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tax Benefit	Rs Lakh	198.80	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-10.78	-5.88	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	14.18	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.38	-0.21	0.00	0.00	0.00	0.00	0.00	0.00	
Discounting Factor		1.00	0.90	0.81	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.10	0.09	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	0.20	0.18	0.17	0.15	0.14	0.12	0.11	0.10	0.09	

Levelised benefit	0.43	Rs/Unit
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**Annexure – 2A**  
**(SHP above 1 MW and up to and including 5 MW)**

**.1 Assumptions Parameters**

Capacity

Assumption Head	Sub-Head	Sub-Head (2)	Unit	<=5 MW
<b>Power Generation</b>	<u>Capacity</u>	Installed Power Generation Capacity	MW	1
		Capacity Utilization Factor	%	30%
		Auxiliary Consumption		1%
		Useful Life	Years	35
<b>Project Cost</b>	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	605.28
<b>Sources of Fund</b>	<u>Debt: Equity</u>	Tariff Period	Years	35
		Debt	%	70%
		Equity	%	30%
		<b>Total Debt Amount</b>	<b>Rs Lacs</b>	<b>423.70</b>
		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	20.24%
		RoE Period	Year	10
		Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.24%
		Weighted average of ROE		22.57%
Discount Rate			10.81%	
<b>Financial Assumptions</b>	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%
		MAT Rate (for first 10 years)	%	20.960%
	<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
		Depreciation Rate 13th year onwards	%	0.87%
		Years for 5.83% rate		12
<b>Working Capital</b>	<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%
<b>Operation &amp; Maintenance</b>	<u>power plant (FY15-16)</u>		Rs Lakh	21.79
		<u>Total O &amp; M Expenses Escalation</u>	%	5.72%

Form 1.2 Form Template for (Small Hydro Projects of Capacity - ) : 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		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	
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	
Interest on working Capital	Rs Lakh		3.68	3.72	3.76	3.80	3.85	3.90	3.95	4.01	4.06	4.13	4.19	4.26	4.33	4.41	4.49	4.57	4.66	4.76	4.86	4.97	5.08	5.20	5.33	5.46	5.60	5.75	5.91	6.07	6.25	6.44	6.63	6.84	7.06	7.30	7.54	
Return on Equity	Rs Lakh		36.76	36.76	36.76	36.76	36.76	36.76	36.76	36.76	36.76	36.76	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	44.01	
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>		<b>150.32</b>	<b>147.02</b>	<b>143.79</b>	<b>140.63</b>	<b>137.56</b>	<b>134.58</b>	<b>131.69</b>	<b>128.89</b>	<b>126.20</b>	<b>123.61</b>	<b>128.40</b>	<b>126.05</b>	<b>96.08</b>	<b>98.59</b>	<b>101.24</b>	<b>104.04</b>	<b>107.00</b>	<b>110.13</b>	<b>113.44</b>	<b>116.94</b>	<b>120.64</b>	<b>124.55</b>	<b>128.69</b>	<b>133.06</b>	<b>137.68</b>	<b>142.56</b>	<b>147.73</b>	<b>153.19</b>	<b>158.96</b>	<b>165.06</b>	<b>171.52</b>	<b>178.34</b>	<b>185.55</b>	<b>193.17</b>	<b>201.23</b>	
Per unit Fixed Cost	Rs/kWh		5.11	5.78	5.65	5.53	5.41	5.29	5.17	5.06	4.95	4.85	4.75	4.94	4.85	3.69	3.79	3.89	4.00	4.11	4.23	4.36	4.49	4.64	4.79	4.95	5.11	5.29	5.48	5.68	5.89	6.11	6.34	6.59	6.85	7.13	7.42	7.73

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	1.51	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69
<b>Total COG</b>	<b>Rs/kWh</b>	<b>5.11</b>	<b>5.78</b>	<b>5.65</b>	<b>5.53</b>	<b>5.41</b>	<b>5.29</b>	<b>5.17</b>	<b>5.06</b>	<b>4.95</b>	<b>4.85</b>	<b>4.75</b>	<b>4.94</b>	<b>4.85</b>	<b>3.69</b>	<b>3.79</b>	<b>3.89</b>	<b>4.00</b>	<b>4.11</b>	<b>4.23</b>	<b>4.36</b>	<b>4.49</b>	<b>4.64</b>	<b>4.79</b>	<b>4.95</b>	<b>5.11</b>	<b>5.29</b>	<b>5.48</b>	<b>5.68</b>	<b>5.89</b>	<b>6.11</b>	<b>6.34</b>	<b>6.59</b>	<b>6.85</b>	<b>7.13</b>	<b>7.42</b>	<b>7.73</b>

COG excl. RoE

Discount Factor		1	0.90	0.81	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.10	0.09	0.09	0.08	0.07	0.06	0.06	0.05	0.05	0.04	0.04	0.03	0.03		
Fixed Cost	5.11	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	133.03	
<b>Levillised Tariff</b>	<b>5.11</b>	<b>Rs/Unit</b>																																				

**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)	20.960%
Income Tax (Normal Rates)	33.990%
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	%	2.64%	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%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	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	15.98	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	17.43	0.00	0.00	0.00	0.00	0.00	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%	
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%	
Closing	%	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%
Accelerated Deprn.	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	

Net Depreciation Benefit	Rs Lakh	589.30	-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	-17.43	0.00	0.00	0.00	0.00	0.00	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	200.30	-10.86	-10.86	-10.86	-10.86	-10.86	-10.86	-10.86	-10.86	-10.86	-10.86	-10.86	-10.86	-10.86	-10.86	-10.86	-10.86	-10.86	-5.93	0.00	0.00	0.00	0.00	0.00	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	
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	0.20	0.18	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	

Levillised benefit	0.44	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	<u>Capacity</u>	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	<u>Debt: Equity</u>	Tariff Period	Years	13
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	385.49
			Total Equity Amout	Rs Lacs	165.21
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	385.49
			Repayment Period(incld Moratorium)	years	12
			Interest Rate	%	13.00%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	165.21
			Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.24%
			RoE Period	Year	10
Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.24%			
Weighted average of ROE		22.57%			
					10.81%
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%
			MAT Rate (for first 10 years)	%	20.960%
			<u>Depreciation</u>		
			Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13th year onwards	%	0.87%
					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	<u>power plant (FY15-16)</u>		Rs Lakh	15.42
			<u>Total O &amp; M Expenses Escalation</u>	%	5.72%



Form 1.2 Form Template for (Small Hydro Projects of Capacity - ) : 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	
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	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
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		3.02	3.05	3.08	3.11	3.15	3.18	3.22	3.26	3.30	3.34	3.39	3.43	3.49	3.54	3.60	3.66	3.72	3.79	3.86	3.94	4.02	4.10	4.19	4.28	4.38	4.49	4.60	4.72	4.84	4.98	5.12	5.26	5.42	5.58	5.76
Return on Equity	Rs Lakh		33.44	33.44	33.44	33.44	33.44	33.44	33.44	33.44	33.44	33.44	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04	40.04
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>		<b>132.04</b>	<b>128.77</b>	<b>125.56</b>	<b>122.40</b>	<b>119.30</b>	<b>116.26</b>	<b>113.28</b>	<b>110.38</b>	<b>107.54</b>	<b>104.79</b>	<b>108.71</b>	<b>106.12</b>	<b>78.39</b>	<b>80.16</b>	<b>82.04</b>	<b>84.02</b>	<b>86.11</b>	<b>88.33</b>	<b>90.67</b>	<b>93.15</b>	<b>95.76</b>	<b>98.53</b>	<b>101.46</b>	<b>104.55</b>	<b>107.82</b>	<b>111.28</b>	<b>114.93</b>	<b>118.80</b>	<b>122.88</b>	<b>127.20</b>	<b>131.77</b>	<b>136.59</b>	<b>141.69</b>	<b>147.09</b>	<b>152.79</b>
Per unit Fixed Cost	Rs/kWh	4.34	5.07	4.95	4.83	4.70	4.59	4.47	4.35	4.24	4.13	4.03	4.18	4.08	3.01	3.08	3.15	3.23	3.31	3.39	3.49	3.58	3.68	3.79	3.90	4.02	4.14	4.28	4.42	4.57	4.72	4.89	5.06	5.25	5.45	5.65	5.87

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	1.04	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	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
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	0.12	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	0.18	0.19	0.19	0.20	0.20	0.21	0.21	0.22
RoE	Rs/kWh	1.37	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54
<b>Total COG</b>	<b>Rs/kWh</b>	<b>4.34</b>	<b>5.07</b>	<b>4.95</b>	<b>4.83</b>	<b>4.70</b>	<b>4.59</b>	<b>4.47</b>	<b>4.35</b>	<b>4.24</b>	<b>4.13</b>	<b>4.03</b>	<b>4.18</b>	<b>4.08</b>	<b>3.01</b>	<b>3.08</b>	<b>3.15</b>	<b>3.23</b>	<b>3.31</b>	<b>3.39</b>	<b>3.49</b>	<b>3.58</b>	<b>3.68</b>	<b>3.79</b>	<b>3.90</b>	<b>4.02</b>	<b>4.14</b>	<b>4.28</b>	<b>4.42</b>	<b>4.57</b>	<b>4.72</b>	<b>4.89</b>	<b>5.06</b>	<b>5.25</b>	<b>5.45</b>	<b>5.65</b>	<b>5.87</b>

COG excl. RoE

Discount Factor			1	0.90	0.81	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.10	0.09	0.09	0.08	0.07	0.06	0.06	0.05	0.05	0.04	0.04	0.03	0.03	
Fixed Cost	4.34		112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	112.84	
<b>Levillised Tariff</b>	<b>4.34</b>	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)	20.960%
Income Tax (Normal Rates)	33.990%
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	%	2.64%	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%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	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	14.54	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	15.86	0.00	0.00	0.00	0.00	0.00	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%
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%
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%
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

Net Depreciation Benefit	Rs Lakh	536.16	-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	-15.86	0.00	0.00	0.00	0.00	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	182.24	-9.88	-9.88	-9.88	-9.88	-9.88	-9.88	-9.88	-9.88	-9.88	-9.88	-9.88	-9.88	-9.88	-9.88	-9.88	-9.88	-5.39	0.00	0.00	0.00	0.00	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
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	0.20	0.18	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

Levellised benefit	0.40	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	Debt: Equity	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	346.02	
			Total Equity Amount	Rs Lacs	148.30	
			Debt Component	Loan Amount	Rs Lacs	346.02
				Repayment Period(incl'd Moratorium)	years	12
				Interest Rate	%	13.00%
			Equity Component	Equity amount	Rs Lacs	148.30
				Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.24%
				RoE Period	Year	10.00
				Return on Equity 11th year onwards (16% gross up with Income tax rate)		24.24%
	Weighted average of ROE		22.24%			
	Discount Rate (equiv. to WACC)		10.81%			
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.99%	
			MAT Rate (for first 10 years)	%	20.960%	
			Depreciation	Depreciation Rate(power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.50%
				Years for 5.83% depreciation rate		12.00
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	Biomass Stock	Months	4
				Interest On Working Capital	%	13.50%
			6	Fuel Related Assumptions	Heat Rate	After Stabilisation period
During Stablization Period	Kcal/kwh	4200				
Biomass	Base Price(FY15-16)	Rs/T				3987.00
	GCV - Biomass	Kcal/kg				3611
7	Operation & Maintenance	power plant (FY 2015-16)	Total O & M Expenses Escalation	Rs Lakh	26.30	
				%	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
<b>Variable Cost</b>	<b>Unit</b>	<b>Year--&gt;</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
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
<b>Per unit Var Cost</b>	<b>Rs/kWh</b>		<b>5.15</b>	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
<b>Fixed Cost</b>	<b>Unit</b>	<b>Year--&gt;</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
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		30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>		<b>149.62</b>	<b>152.16</b>	<b>150.05</b>	<b>148.04</b>	<b>146.12</b>	<b>144.31</b>	<b>142.61</b>	<b>141.03</b>	<b>139.57</b>	<b>138.25</b>	<b>142.98</b>	<b>141.94</b>	<b>126.45</b>	<b>129.47</b>	<b>132.67</b>	<b>136.05</b>	<b>139.63</b>	<b>143.40</b>	<b>147.40</b>	<b>151.62</b>
<b>Per unit Fixed Cost</b>	<b>Rs/kWh</b>		<b>2.92</b>	2.41	2.38	2.35	2.32	2.29	2.26	2.24	2.21	2.19	2.27	2.25	2.00	2.05	2.10	2.16	2.21	2.27	2.34	2.40
<b>Levallised tariff corresponding to Useful life</b>																						
<b>Per Unit Cost of Generation</b>	<b>Unit</b>	<b>Levallised</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
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	0.51	0.59	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
<b>Total COG</b>	<b>Rs/kWh</b>	<b>7.50</b>	<b>8.07</b>	<b>7.57</b>	<b>7.53</b>	<b>7.50</b>	<b>7.47</b>	<b>7.44</b>	<b>7.41</b>	<b>7.39</b>	<b>7.37</b>	<b>7.34</b>	<b>7.42</b>	<b>7.40</b>	<b>7.16</b>	<b>7.21</b>	<b>7.26</b>	<b>7.31</b>	<b>7.37</b>	<b>7.43</b>	<b>7.49</b>	<b>7.56</b>
<b>Levallised Tariff</b>	<b>Unit</b>	<b>Year --&gt;</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
Discount Factor			1	0.902	0.814	0.735	0.663	0.599	0.540	0.488	0.440	0.397	0.358	0.323	0.292	0.263	0.238	0.215	0.194	0.175	0.158	0.142
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
<b>Levallised Tariff (Variable)</b>	<b>Rs/kWh</b>		<b>5.15</b>																			
<b>Levallised Tariff (Fixed)</b>	<b>Rs/kWh</b>		<b>2.35</b>																			
<b>Levallised Tariff (Rs/Unit)</b>	<b>Rs/kWh</b>		<b>7.50</b>																			

**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)	20.960%
Income Tax (Normal Rates)	33.99%
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	%	2.64%	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%	2.88%	0.00%	0.00%
Book Depreciation	Rs Lakh	13.05	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	14.24	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 Deprn.	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	481.27	-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	-14.24	0.00	0.00	
Tax Benefit	Rs Lakh	163.58	-8.87	-8.87	-8.87	-8.87	-8.87	-8.87	-8.87	-8.87	-8.87	-8.87	-8.87	-8.87	-8.87	-8.87	-8.87	-8.87	-8.87	-4.84	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	6.38	-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	-0.08	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	0.20	0.18	0.17	0.15	

Tax Benefit Levellised 9.94

Electricity Generation (Levellised) 5.91

<b>Levellised benefit</b>	<b>0.17 (Rs/kWh)</b>
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**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	Debt: Equity	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	342.31	
			Total Equity Amout	Rs Lacs	146.71	
			Debt Component	Loan Amount	Rs Lacs	342.31
				Repayment Period(incld Moratorium)	years	12
				Interest Rate	%	13.00%
			Equity Component	Equity amount	Rs Lacs	146.71
				Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.24%
				RoE Period	Year	10.00
Return on Equity 11th year onwards (16% gross up with Income tax rate)		24.24%				
		Discount Rate (equiv. to WACC)		10.81%		
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.99%	
			MAT Rate (for first 10 years)	%	20.960%	
			Depreciation	Depreciation Rate(power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.50%
				Years for 5.83% depreciation rate		12.00
5	Working Capital	For Fixed Charges O&M Charges Maintenance Spare Receivables for Debtors For Variable Charges Biomass Stock Interest On Working Capital	(% of O&M exepenses)	Months	1	
				Months	15%	
				Months	2	
				Months	4	
				%	13.50%	
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	3600	
			Biomass	Base Price - Bagasse (FY14-15)	Rs/T	2326.84
				GCV - Bagasse	Kcal/kg	2250
7	Operation & Maintenance	power plant (FY 2015-16)			17.31	
			Total O & M Expenses Escalation	%	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	12.23	12.23	12.23	12.23	12.23	12.23	12.23
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		16.47	16.50	16.54	16.57	16.61	16.65	16.69	16.73	16.78	16.83	16.88	16.93	16.99	17.05	17.11	17.18	17.25	17.33	17.41	17.49
Return on Equity	Rs Lakh		29.70	29.70	29.70	29.70	29.70	29.70	29.70	29.70	29.70	29.70	35.56	35.56	35.56	35.56	35.56	35.56	35.56	35.56	35.56	35.56
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>		<b>134.65</b>	<b>131.97</b>	<b>129.34</b>	<b>126.77</b>	<b>124.27</b>	<b>121.84</b>	<b>119.48</b>	<b>117.19</b>	<b>114.99</b>	<b>112.88</b>	<b>110.72</b>	<b>108.59</b>	<b>106.52</b>	<b>104.51</b>	<b>102.62</b>	<b>100.84</b>	<b>99.19</b>	<b>97.68</b>	<b>96.21</b>	<b>94.81</b>

**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	<b>4.07</b>	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	<b>0.53</b>	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	<b>0.53</b>	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	<b>0.45</b>	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	<b>0.35</b>	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	<b>0.65</b>	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
<b>Total COG</b>	<b>Rs/kWh</b>	<b>6.58</b>	<b>6.87</b>	<b>6.81</b>	<b>6.76</b>	<b>6.70</b>	<b>6.65</b>	<b>6.60</b>	<b>6.55</b>	<b>6.51</b>	<b>6.46</b>	<b>6.42</b>	<b>6.50</b>	<b>6.46</b>	<b>6.12</b>	<b>6.16</b>	<b>6.20</b>	<b>6.25</b>	<b>6.30</b>	<b>6.35</b>	<b>6.40</b>	<b>6.46</b>

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	0.902	0.814	0.735	0.663	0.599	0.540	0.488	0.440	0.397	0.358	0.323	0.292	0.263	0.238	0.215	0.194	0.175	0.158	0.142

Levillised Tariff (Variable)	4.07
Levillised Tariff (Fixed)	2.51
<b>Levillised Tariff (Rs/Unit)</b>	<b>6.58</b>

**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)	20.960%
Income Tax (Normal Rates)	33.99%
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	%	2.64%	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%	2.88%	0.00%	0.00%
Book Depreciation	Rs Lakh	12.91	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	14.08	0.00	0.00

Accelerated Depreciation		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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 Deprn.	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	476.11	-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	-14.08	0.00	0.00
Tax Benefit	Rs Lakh	161.83	-8.78	-8.78	-8.78	-8.78	-8.78	-8.78	-8.78	-8.78	-8.78	-8.78	-8.78	-8.78	-8.78	-8.78	-8.78	-8.78	-4.79	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	0.20	0.18	0.17	0.15

<b>Levellised benefit</b>	<b>0.22</b>	<b>(Rs/kWh)</b>
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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(incld 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	20.24%
RoE Period	Year	10			
Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.24%			
Weighted average of ROE		22.24%			
Discount Rate		10.81%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%
			MAT Rate (for first 10 years)	%	20.9605%
			<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 &amp; M Expenses Escalation</u>	%	5.72%

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

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	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
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	3.10	3.13	3.16	3.19	3.22	3.25	3.29	3.32	3.36	3.40	3.44	3.49	3.54	3.59	3.64	3.70	3.76	3.82	3.89	3.96	4.04	4.12	4.20
Return on Equity	Rs Lakh		36.79	36.79	36.79	36.79	36.79	36.79	36.79	36.79	36.79	36.79	36.79	44.06	44.06	44.06	44.06	44.06	44.06	44.06	44.06	44.06	44.06	44.06	44.06	44.06	44.06
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>		<b>141.02</b>	<b>137.20</b>	<b>133.41</b>	<b>129.68</b>	<b>125.99</b>	<b>122.35</b>	<b>118.77</b>	<b>115.25</b>	<b>111.79</b>	<b>108.39</b>	<b>112.32</b>	<b>109.07</b>	<b>82.16</b>	<b>83.66</b>	<b>85.24</b>	<b>86.91</b>	<b>88.68</b>	<b>90.54</b>	<b>92.52</b>	<b>94.61</b>	<b>96.81</b>	<b>99.15</b>	<b>101.61</b>	<b>104.22</b>	<b>106.98</b>
<b>Per unit Fixed Cost</b>	<b>Rs/kWh</b>	<b>7.07</b>	<b>8.47</b>	<b>8.24</b>	<b>8.02</b>	<b>7.79</b>	<b>7.57</b>	<b>7.35</b>	<b>7.14</b>	<b>6.92</b>	<b>6.72</b>	<b>6.51</b>	<b>6.75</b>	<b>6.55</b>	<b>4.94</b>	<b>5.03</b>	<b>5.12</b>	<b>5.22</b>	<b>5.33</b>	<b>5.44</b>	<b>5.56</b>	<b>5.68</b>	<b>5.82</b>	<b>5.96</b>	<b>6.11</b>	<b>6.26</b>	<b>6.43</b>
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	<b>1.24</b>	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	<b>1.76</b>	2.12	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
Int. on term loan	Rs/kWh	<b>1.52</b>	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	<b>0.20</b>	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	<b>2.34</b>	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65
<b>Total COG</b>	<b>Rs/kWh</b>	<b>7.07</b>	<b>8.47</b>	<b>8.24</b>	<b>8.02</b>	<b>7.79</b>	<b>7.57</b>	<b>7.35</b>	<b>7.14</b>	<b>6.92</b>	<b>6.72</b>	<b>6.51</b>	<b>6.75</b>	<b>6.55</b>	<b>4.94</b>	<b>5.03</b>	<b>5.12</b>	<b>5.22</b>	<b>5.33</b>	<b>5.44</b>	<b>5.56</b>	<b>5.68</b>	<b>5.82</b>	<b>5.96</b>	<b>6.11</b>	<b>6.26</b>	<b>6.43</b>
Discount Factor			1	0.90	0.81	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.10	0.09	0.09
Fixed Cost	7.07		117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61	117.61
<b>Levallised Tariff</b>	<b>7.07</b>	<b>Rs/Unit</b>																									

**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)	20.961%
Income Tax (Normal Rates)	33.990%
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	%	2.64%	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%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	15.99	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	17.45	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%
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	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	589.86	-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	-17.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	200.49	-10.87	-10.87	-10.87	-10.87	-10.87	-10.87	-10.87	-10.87	-10.87	-10.87	-10.87	-10.87	-10.87	-10.87	-10.87	-10.87	-5.93	0.00	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	24.09	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.90	0.81	0.74	0.66	0.60	0.54	0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.10	0.09	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	0.20	0.18	0.17	0.15	0.14	0.12	0.11	0.10	0.09

<b>Levellised benefit</b>	<b>0.73</b>	<b>Rs/Unit</b>	6.98	7.48
			6.25	6.75

**Annexure – 5B**  
**(Solar Thermal Projects)**

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Auumpions	
1	<b>Power Generation</b>	<u>Capacity</u>	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	23.0%	
			Auxiliary Consumption Factor	%	10.0%	
			Life of Power Plant	Years	25	
2	<b>Project Cost</b>	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	1200	
3	<b>Sources of Fund</b>		Tariff Period	Years	25	
			<u>Debt: Equity</u>			
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	840	
			Total Equity Amout	Rs Lacs	360	
			<u>Funding Options-1 (Domestic Loan Source-1)</u>			
			Loan Amount	Rs Lacs	840	
			Moratorium Period	years	0	
			Repayment Period(incl Moratorium)	years	12	
			Intrest Rate	%	13.00%	
			<u>Funding Options-2 ( Equity Finance )</u>			
			Equity amount	Rs Lacs	360	
Return on Equity for first 10 years (16% gross up with MAT rate)	% p.a	20.24%				
RoE Period	Year	10				
Return on Equity 11th year onwards (16% gross up with Income tax rate)	% p.a	24.24%				
Weighted average of ROE		22.64%				
Discount Rate		10.81%				
4	<b>Financial Assumptions</b>	<u>Fiscal Assumptions</u>	Income Tax	%	33.99%	
			MAT Rate (for first 10 years)	%	20.96%	
			80 IA benefits	Yes/No	Yes	
			<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	<b>Working Capital</b>		<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>			
Intrest On Working Capital	%	13.50%				
7	<b>Operation &amp; Maintenance</b>		power plant	1% of base capital cost	Rs Lakh	15
			<u>Total O &amp; M Expenses Escalation</u>		%	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	MU		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		5.38	5.41	5.43	5.46	5.50	5.53	5.57	5.60	5.64	5.69	5.73	5.78	5.83	5.88	5.94	5.99	6.06	6.12	6.19	6.27	6.34	6.43	6.51	6.60	6.70
Return on Equity	Rs Lakh		72.87	72.87	72.87	72.87	72.87	72.87	72.87	72.87	72.87	72.87	72.87	72.87	87.26	87.26	87.26	87.26	87.26	87.26	87.26	87.26	87.26	87.26	87.26	87.26	87.26
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>		<b>267.90</b>	<b>259.69</b>	<b>251.52</b>	<b>243.41</b>	<b>235.36</b>	<b>227.36</b>	<b>219.43</b>	<b>211.57</b>	<b>203.78</b>	<b>196.06</b>	<b>202.80</b>	<b>195.25</b>	<b>140.79</b>	<b>142.51</b>	<b>144.34</b>	<b>146.27</b>	<b>148.30</b>	<b>150.46</b>	<b>152.74</b>	<b>155.15</b>	<b>157.69</b>	<b>160.39</b>	<b>163.23</b>	<b>166.24</b>	<b>169.42</b>
<b>Per unit Fixed Cost</b>	<b>Rs/kWh</b>		<b>14.77</b>	<b>14.32</b>	<b>13.87</b>	<b>13.42</b>	<b>12.98</b>	<b>12.54</b>	<b>12.10</b>	<b>11.67</b>	<b>11.24</b>	<b>10.81</b>	<b>11.18</b>	<b>10.77</b>	<b>7.76</b>	<b>7.86</b>	<b>7.96</b>	<b>8.07</b>	<b>8.18</b>	<b>8.30</b>	<b>8.42</b>	<b>8.56</b>	<b>8.70</b>	<b>8.84</b>	<b>9.00</b>	<b>9.17</b>	<b>9.34</b>

#### Levelised COG

Per Unit Cost of Generation	Unit	Levelised	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	3.33	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	0.30	0.30	0.31	0.31	0.31	0.31	0.31	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	4.23	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	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
<b>Total COG</b>	<b>Rs/kWh</b>	<b>12.03</b>	<b>14.77</b>	<b>14.32</b>	<b>13.87</b>	<b>13.42</b>	<b>12.98</b>	<b>12.54</b>	<b>12.10</b>	<b>11.67</b>	<b>11.24</b>	<b>10.81</b>	<b>11.18</b>	<b>10.77</b>	<b>7.76</b>	<b>7.86</b>	<b>7.96</b>	<b>8.07</b>	<b>8.18</b>	<b>8.30</b>	<b>8.42</b>	<b>8.56</b>	<b>8.70</b>	<b>8.84</b>	<b>9.00</b>	<b>9.17</b>	<b>9.34</b>

#### Levelised

Fixed Cost	12.03	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07	218.07
<b>Total COG</b>	<b>12.03</b>																										

