Before the

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

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Case No. 10 of 2012

In the matter of
Determination of Generic Tariff for the third year of the first Control Period under Regulation 8 of the Maharashtra Electricity Regulatory Commission (Terms and Conditions for Determination of Renewable Energy Tariff) Regulations, 2010

Shri V.P. Raja, Chairman
Shri Vijay L. Sonavane, Member

DRAFT ORDER (SUO-MOTU)

Dated: January__, 2012

In exercise of the powers vested under Section 61 read with Section 181 of the Electricity Act 2003 (“EA 2003”), the Maharashtra Electricity Regulatory Commission ("MERC" or "the Commission") has notified the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, (“the RE Tariff Regulations”) on June 7, 2010. The RE Tariff Regulations provide for Terms and Conditions and the Procedure for determination of generic tariff on suo-motu basis in respect of the following Renewable Energy (RE) generating stations:

(a) Wind Power Projects;
(b) Small Hydro Projects, Mini and Micro Hydro Projects;
(c) Biomass Power Projects;
(d) Qualifying and Non-Qualifying Non-fossil fuel-based co-generation Plants;
(e) Solar Photo Voltaic (PV) Projects,
(f) Solar Thermal Power Projects,
(g) Solar Rooftop PV and other small Solar Power Projects.

2. Regulation 8.1 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 said Regulations on suo-motu basis, as reproduced below:

> *"8.1 The Commission shall notify the generic preferential tariff on suo-motu basis pursuant to issuance of revised norms by Central Electricity Regulatory Commission at the beginning of each year of the Control Period for renewable energy technologies for which norms have been specified under the Regulations.*
>
> *Provided that for the first year of Control Period, (i.e. FY 2010-11), the generic tariff on suo-motu basis may be determined within a period not exceeding three months from the date of notification of these Regulations."*

3. Accordingly, the Commission vide its Order dated July 14, 2010, issued the Order for the 'Determination of Generic Tariff for RE Technologies for the First year of the Control Period, i.e., FY 2010-11' on suo-motu basis.

4. Further, in accordance with the above Regulations, the Commission, vide its Order dated April 26, 2011, issued the Order for the 'Determination of Generic Tariff for RE Technologies for the second year of the Control Period, i.e., FY 2011-12' on suo-motu basis. The same is applicable for Renewable Energy Projects to be commissioned in Maharashtra during the second year of the control period, i.e., from April 1, 2011 to March 31, 2012.

5. **The Commission in due discharge of the mandate under Regulation 8.1of the RE Regulations proceeds to determine the Generic Tariff for RE Technologies for the Third Year of the Control Period, i.e., FY 2012-13 through this draft Order and invites objections and suggestions from various Stakeholders**.

1. Common Parameters applicable for determination of Generic Tariff

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

1.1. CONTROL PERIOD

Regulation 5 of the RE Tariff Regulations specifies that the Control 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 Control Period was FY 2010-11, the second year of the Control Period was FY 2011-12, and the third year of the Control Period is FY 2012-13. The Proviso to Regulation 5.1 stipulates that the tariff determined for the RE projects commissioned during the Control Period shall continue to be applicable for the entire duration of the Tariff Period (as specified in Regulation 6 of the RE Tariff Regulations).

Further, as stipulated under Regulation 5.2 of the RE Tariff Regulations, the generic tariff determined for Solar PV projects and Rooftop Solar PV and other small solar projects based on the Capital Cost and other norms applicable for FY 2011-12 vide Commission's Order dated April 29, 2011 shall also apply for such projects during FY 2012-13, provided that (i) the Power Purchase Agreements (PPA) in respect of the Solar PV projects as mentioned in this Paragraph are signed on or before March 31, 2012; and (ii) the entire capacity covered by the Power Purchase Agreements is commissioned on or before March 31, 2013 in respect of Solar PV projects.

Further, for those Solar photovoltaic power projects and Rooftop Solar PV and other small solar projects whose PPAs are signed after March 31, 2012, the tariff for such projects for their commissioning during FY 2012-13 would be based on the benchmark capital cost norm for Solar PV power projects for FY 2012-13 as specified under Paragraph 6.4 of this Order.

As specified under Regulation 5.2 of the RE Tariff Regulations, the generic tariff determined for Solar thermal projects based on the Capital Cost and other norms for FY 2010-11 shall also apply for such projects to be commissioned during FY 2011-12 and FY 2012-13, provided that (i) the Power Purchase Agreements (PPA) in respect of Solar thermal projects as mentioned in this Paragraph are signed on or before March 31, 2011; and (ii) the entire capacity covered by the Power Purchase Agreements is commissioned on or before March 31, 2013 in respect of such Solar thermal projects.

Further, for those Solar thermal power projects whose PPAs are signed after March 31, 2011, the tariff for such projects for their commissioning during FY 2012-13 would be

based on the benchmark capital cost norm for Solar thermal power projects for FY 2012-13 as specified under Paragraph 7.4 of this Order.

1.2. TARIFF STRUCTURE

Regulation 9.1 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 power projects and non-fossil fuel based cogeneration projects, single-part tariff with two components, i.e., 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 technology specific Sections in detail.

1.3. TARIFF DESIGN

In accordance with Regulation 10 of the RE Tariff Regulations, the Tariff Design for RE generating stations is as under**:**

"10.1 The generic tariff shall be determined on levellised basis for the Tariff Period.

...

10.2 For the purpose of levellised tariff computation, the discount factor equivalent to normative weighted average cost of capital shall be considered.

10.3 Levellisation shall be carried out for the 'useful life' of the Renewable Energy project while tariff shall be specified for the period equivalent to 'Tariff Period'."

1.4. INTEREST ON LOAN

Regulation 14.1 of the RE Tariff Regulations specifies that the loan tenure of 10 years is to be considered for the purpose of determination of generic tariff for RE projects. Regulation 14.2 provides for consideration of the rate of interest on loan as under:

> "*The loans arrived at in the manner indicated above shall be considered as gross normative loan for calculation for interest on loan. The normative loan outstanding as on April 1st of every year shall be worked out by deducting the cumulative repayment up to March 31st of previous year from the gross normative loan.*
> *For the purpose of computation of tariff, the normative interest rate shall be considered as average of State Bank Advance Rate (SBAR) prevalent during the previous year plus 150 basis points.*
> *Notwithstanding any moratorium period availed by the generating company, 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."*

However, it may be noted that as per the guidelines issued by the Reserve Bank of India (RBI) dated July 01, 2010 related to interest rates on loan advances, all banks have been directed to switch over to the system of Base Rate with effect from July 01, 2010 by replacing the existing Benchmarking Prime Lending Rate (BPLR) [also known as Advance Rate, which is referred to in the RE Tariff Regulations] (Ref. Master circular by RBI, http://www.rbi.org.in/scripts/BS_ViewMasCirculardetails.aspx?id=5816#a9). This policy shift is a result of the recommendation made by the Working Group on Benchmark Prime Lending Rate constituted by RBI in its Report submitted in October 2009. As per the Report, BPLR system is incompatible with the market situation and has fallen short of expectation to enhance transparency in lending rate due to which BPLR system needs to be replaced with Base Rate system.

As per this new guideline, all categories of loans have to be priced only with reference to the Base Rate with effect from July 01, 2010. The Base Rate is the minimum rate for all loans below which, banks are not permitted to lend any funds. All banks have been directed to determine their actual lending rates on loans and advances with reference to the Base Rate plus borrower-specific charges, which will include product-specific operating costs, credit risk premium and tenor premium. Accordingly, all banks in India including the State Bank of India (SBI), have replaced Benchmark Prime Lending Rate with the new regime of Base Rate with effect from July 01, 2010. Further, in order to give

banks some time to stabilize the system of Base Rate calculation, banks were permitted to change the benchmark and methodology any time during the initial six month period, i.e., latest by end-December 2010. Accordingly, the system of Base Rate based lending has been under operation for the past one year. The Base Rate as notified by State Bank of India for the period April-2011 to January 2012 is summarised below:

Period	**Base Rate (%)**	**Period (no of days)**
1-April-2011 to 24-April-2011	8.25%	24
25-April-2011to 11-May-2011	8.50%	17
12-May-2011 to 10-July-2011	9.25%	60
11-July-2011 to 12-August-2011	9.50%	33
13-August-2011to 20-January-2012	10.00%	161
Weighted Average Base Rate for FY 2011 – 12	**9.56%**	**295**

Furthermore, the draft RE Tariff Regulations published by CERC for the next Control Period, has also linked the normative interest rate with Base Rate of State Bank of India. The draft CERC RE Regulations proposes normative interest rate equal to three hundred (300) basis points above the State Bank of India Base Rate prevalent during the first six months of the previous year.

Hence, in view of the significant policy shift of BPLR to Base Rate for Banks as per RBI Guidelines and in order to remove the difficulty in implementing Regulation 14.2 of the RE Tariff Regulations, the Commission has decided to revise the computation of normative interest rate from Prime Lending Rate (Advance Rate) to Base Rate in pursuance of the powers of the Commission under "Removal of Difficulty" as specified in Regulation 77.1 of the RE Tariff Regulations.

Further, in order to factor in the concerns for lending to RE projects, the Commission has decided to consider a spread of 300 basis points above the average Base Rate of State Bank of India to arrive at normative interest rate for loan financing of the RE projects.

Thus, Interest on normative long-term loan shall be computed at an interest rate equivalent to average Base Rate of State Bank of India during the previous year plus 300 basis points.

Accordingly, the weighted average of State Bank of India Base Rate for FY 2011-12 as available till January 20, 2012 as shown in the above table, plus 300 basis points, works

out to an interest rate of 12.56 % p.a. (9.56% + 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 17.3 of the RE Tariff Regulations provides for computation of the rate of interest on working capital as under:

> *"Interest on Working Capital shall be at interest rate equivalent to average State Bank Advance Rate (SBAR) during the previous year plus 100 basis points."*

In view of the rationale elaborated in Paragraph 1.4 above, the Commission has decided to revise the computation of normative interest rate on working capital also, by moving from Prime Lending Rate system to Base Rate system in pursuance of the powers of the Commission under "Removal of Difficulty" as specified in Regulation 77.1 of the RE Tariff Regulations.. Further, in order to factor in the concerns for lending for RE projects, the Commission has decided to consider a spread of 250 basis points above the average Base Rate of State Bank of India to arrive at the normative interest rate on working capital. Thus, Interest on Working Capital loan shall be computed at an interest rate equivalent to average Base Rate of State Bank of India during the previous year plus 250 basis points.

Accordingly, the weighted average State Bank of India Base Rate for FY 2011-12 as available till January 20, 2012 as shown in the above table, plus 250 basis points, works out to an interest rate of 12.06 % (9.56% + 250 basis points), which has been considered as 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 useful life of each technology considering the discount factor equivalent to weighted average cost of capital, to represent the time value of money.

Discount Factor

The discount factor considered for this purpose is equal to the weighted average cost of capital on the basis of normative debt:equity ratio (70:30) specified in the Regulations, and weighted average rates for debt and equity component.

Interest Rate considered for the loan component (i.e., 70%) of Capital Cost is 12.56% (as explained in Paragraph 1.4 above). For the equity component (i.e., 30%), rate of Return on Equity (ROE) for the first ten (10) years is 19%, and for the 11th year onwards till useful life of the RE project, the rate is 24%. Based on these rates, the weighted average ROE has been calculated, which is around 22.3% (ranging from 22% to 22.57% 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.

1.7. SUBSIDY OR INCENTIVE PROVIDED BY THE CENTRAL/STATE GOVERNMENT

Regulation 22 of the RE Tariff Regulations specifies:

> *"The Commission shall take into consideration any incentive or subsidy offered by the Central or State Government, including accelerated depreciation benefit if availed by the generating company, for the renewable energy power plants while determining the tariff under these Regulations.*
>
> *Provided that the following principles shall be considered for ascertaining income tax benefit on account of accelerated depreciation, if availed, for the purpose of tariff determination:*
>
> *a) Assessment of benefit shall be based on normative capital cost, accelerated depreciation rate as per relevant provisions under Income Tax Act and corporate income tax rate.*
> *b) Capitalisation of RE projects during second half of the fiscal year.*
> *c) Per unit benefit shall be derived on levellised basis at discount factor equivalent to weighted average cost of capital."*

Accordingly, for the projects availing the benefit of accelerated depreciation as per applicable Income Tax rate of 32.445% (30% IT rate + 5% 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, 1956) has been compared with depreciation as per Income Tax Act, i.e., 80% under Written Down Value method, and depreciation for the first year has been calculated at the rate of 50% of 80%, i.e., 40%, assuming the project to be capitalized during the second

half of the financial year as per proviso (ii) to Regulation 22. The tax benefit has been worked out as per 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 under Regulation 22.1 of the RE Tariff Regulations, in case any Central Government or State Government notification specifically provides for any Generation Based Incentive (GBI) over and above tariff, the same shall not be factored in while determining tariff. Thus, while determining the tariffs for RE projects in this Order, no such incentives have been considered.

1.8. SHARING OF CDM BENFITS

As per Regulation 21.1 of the RE Tariff Regulations, all risks, costs and efforts associated with the availing of carbon credits shall be borne by the Generating Company. Further, the entire proceeds of carbon credit from approved CDM project, if any, shall be retained by the Generating Company.

1.9. APPLICABILITY OF TARIFF ORDER

This Tariff Order shall be applicable for New RE Projects to be commissioned during FY 2012-13 (i.e. from April 1, 2012 to March 31, 2013).

The applicable Tariff Rate, Tariff Structure and other terms and conditions for RE Projects (commissioned on or before March 31, 2012 will be in accordance with the relevant provisions outlined under the Generic RE Tariff Order for FY 2011-12 (Case No. 39 of 2011 dated April 29, 2011) issued by the Commission.

The following Sections of the Order outline the technology-wise norms and corresponding Generic Tariff for New RE Projects to be commissioned during FY 2012-13 based on various renewable energy technologies.

2. WIND ENERGY PROJECTS

2.1. USEFUL LIFE

Regulation 2.1 (ff) 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 date of commercial operation (COD) till such time as specified under the RE Tariff Regulations, for such generation facility. Accordingly, the useful life for wind energy projects as specified under Regulation 2.1 (ff) is 25 years from COD.

2.2. TARIFF PERIOD

Regulation 6 of the RE Tariff Regulations specifies the Tariff Period for various RE projects. Accordingly the Tariff Period for wind energy projects is 13 years, considered from the date of commercial operation of the RE project, and the tariff determined under the Regulations shall be applicable only for the duration of the Tariff Period.

2.3. CAPITAL COST

Wind energy projects located at the wind sites having minimum annual Wind Power Density (WPD) of 200 Watt/m^2 measured at hub height of 50 metres and using new wind turbine generators are eligible for the preferential tariff as determined under the RE Tariff Regulations. The Commission, under its recent Order dated January 11, 2012 (Case No. 153 of 2011) in the matter of Petition filed by M/s Gamesa, has considered the submissions made by MNRE that the provision for consideration of WPD of 200 W/m2 at 50 m hub height does not hold relevance any longer. However, the Commission has observed that it will be necessary to initiate suitable actions to amend the RE Tariff Regulations appropriately to address the issue and other incidental matters connected therewith. Hence, pending such amendment of the RE Tariff Regulations, this Order is based on the provisions as outlined under existing RE Tariff Regulations.

In order to determine the yearly normative Capital Cost for such eligible Wind Energy Projects over the Control Period, the RE Tariff Regulations specify an indexed capital cost to be notified on a yearly basis pursuant to issuance of such indexed Capital Cost by Central Electricity Regulatory Commission (CERC) for wind energy projects in accordance with indexation mechanism stipulated under CERC RE Tariff Regulations. As the first Control Period for CERC RE Tariff Regulations 2009 is valid only till March 2012, CERC is in the process of finalisation of RE Regulations for the next Control Period

(i.e., FY 2012-13 to FY 2016-17). The CERC has proposed the same indexation mechanism to determine the capital cost for each year of the next Control Period as specified in its existing CERC RE Regulations 2009. Since Regulation 25 of the RE Tariff Regulations specifies that the indexation mechanism as stipulated under CERC RE Tariff Regulations has to be considered for determination of capital cost, the Commission has derived the capital cost of the wind project based on the same indexation formula for the wind projects to be commissioned in FY 2012-13 as was considered for earlier Orders in line with CERC RE Tariff Regulations, 2009.

While arriving at the index for capital cost norm for FY 2012-13 for the wind projects in Maharashtra, the Commission has considered the indices related information for the period of 11 months during calendar year 2011 starting from January 2011 to November 2011. Besides, in accordance with the RE Tariff Regulations, the calendar year 2009 has been considered as the base year. Accordingly, the indexed capital cost for wind energy projects to be commissioned during FY 2012-13 works out to Rs 516.94 Lakh/MW as summarised under the following table:

Capital Cost Indexation for Wind Power Projects (FY2012-13)

Indexation Formulation
CC(n)=P&M(n)*[1+F1+F2+F3]
dn = (a*(SIn-1/SI0)-1)+b*(EIn-1/EI0)-1))/(a+b)
P&M(n)=P&M(0)*(1+dn)

Variable	Description	Value
a	Weightage for Steel Index	0.6
b	Weightage for Electrical Machinery Index	0.4
F_1	Factor for Land and Civil Work	0.08
F_2	Factor for Erection and Commissioning	0.07
F_3	Factor for IDC and Financing	0.10

Month/Year	Electrical & Machinery		Iron & Steel	
	2011	2009	2011	2009
January	125.10	124.60	143.70	118.00
Febuary	125.10	124.50	145.50	118.00
March	126.40	123.90	146.10	117.20
April	127.20	123.60	144.20	124.00
May	127.60	123.80	141.80	124.30
June	128.00	123.70	142.50	122.20
July	128.70	123.70	142.50	123.10
August	129.20	123.70	142.10	125.30
September	130.90	120.30	142.80	131.40
October	131.00	120.70	142.60	130.80
November	130.70	120.50	142.80	131.70
December		120.40		131.60
Average	**128.17**	**122.78**	**143.33**	**124.80**

Parameter	Description	Value
$CC_{(0)}$(RsL/MW)	Capital Cost for the Base Year	467.13
$P\&M_{(0)}$ (RsL/MW)	Plant & Machinery Cost for the Base Year	373.70
dn	Capital Cost Escalation Factor	10.66%
$P\&M_{(n)}$ (RsL/MW)	**Plant & Machinery Cost for the nth Year (FY 2012-13)**	**413.55**
$CC_{(n)}$ (RsL/MW)	**Capital Cost for the nth Year (FY2012-13)**	**516.94**

2.4. DEBT-EQUITY RATIO

Regulation 13.1 of the RE Tariff Regulations 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 stipulated Capital Cost, the debt and equity component for wind energy projects works out to Rs. 361.86 Lakh / MW and Rs. 155.08 Lakh / MW, respectively, for FY 2012-13.

2.5. RETURN ON EQUITY

Regulation 16.2 stipulates the normative Return on Equity (RoE) as under:

(a) Pre-tax 19% per annum for the first 10 years, and

(b) Pre-tax 24% per annum from the 11th year onwards.

Accordingly, Return on Equity for FY 2012-13 works out as under:

Opening Equity (Rs lakh / MW)	155.08
Return on Equity for the first 10 years @19% (Rs lakh / MW)	29.47
Return on Equity after first 10 years @24% (Rs lakh / MW)	37.22

2.6. INTEREST ON LOAN

As explained above in Paragraph 1.4 of this Order, the interest rate of 12.56% (9.56% SBI Base Rate + 300 basis points) has been considered for Wind Energy Projects for loan amount of Rs. 361.86 Lakh / MW in FY 2012-13.

2.7. DEPRECIATION

Regulation 15 of the RE Tariff Regulations specifies that depreciation is to be allowed up to a maximum of 90% of the Capital Cost of the asset and the depreciation rate for the first 10 years of the Tariff Period shall be 7% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 11th year onwards.

Accordingly, for Wind Energy Projects, depreciation rate is 7% for the first 10 years, and works out to 1.33% thereafter, for the remaining useful period of 15 years.

2.8. INTEREST ON WORKING CAPITAL

Regulation 17.1 of the RE Tariff Regulations provides for computation of the working capital requirements of the wind projects as under:

"(a) Operation & Maintenance expenses for one month;
(b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;
(c) Maintenance Spares @ 15% of operation and maintenance expenses."

Further, as explained above in Paragraph 1.5 of this Order, Interest on Working Capital shall be computed at an interest rate equivalent to average Base Rate of State Bank of India during the previous year plus 250 basis points. Paragraph 1.4 of this Order shows that average Base Rate of State Bank of India for FY 2011-12 is 9.56%. Accordingly, the rate of Interest on Working Capital for wind energy projects in FY 2012-13 works out to 12.06% (9.56% + 250 basis points).

2.9. OPERATION AND MAINTENANCE (O&M) EXPENSES

In accordance with Regulation 27 of the RE Tariff Regulations, the normative O&M expenses for wind energy projects for FY 2010-11 is Rs 6.87 Lakh/MW, to be escalated at the rate of 5.72% per annum over the Tariff Period for determination of the levelised tariff. Accordingly, the Commission has considered O&M expense norm for wind energy projects as Rs 7.68 Lakh/MW for FY 2012-13.

2.10. CAPACITY UTILISATION FACTOR

In accordance with Regulation 26 of the RE Tariff Regulations, the norms for Capacity Utilization Factor (CUF) specified for wind energy projects are as under:

Wind Energy Projects	**CUF**
Annual Mean Wind Power Density (W/m^2)	
Wind zone-1 (200-250)	20%
Wind zone-2 (250-300)	23%
Wind zone-3 (300-400)	27%
Wind zone-4 (above 400)	30%

In accordance with Regulation 26.2 of the RE Tariff Regulations, the annual mean wind power density is to be measured at 50 metre hub-height and as per Regulation 26.3, for the purpose of classification of wind energy project into particular wind zone class, the State-wise wind power density map prepared by Centre for Wind Energy Technology (C-WET) annexed as schedule to the RE Tariff Regulations, is to be considered, provided that the said Schedule may be amended based on inputs provided by C-WET/MNRE.

Further, as directed by the Commission in its generic RE Tariff Order for FY 2010-11 (Case No. 20 of 2010 dated July 14, 2010), the State Nodal Agency, MEDA has provided the procedure for classification of wind power projects into wind zone class vide its letter ref: MEDA Letter no. IDD 2011/CR-28/WRA-028/2011-12/2897 dated July 16, 2011 and published it on its website. The same has been approved by the Commission vide its letter no. MERC/MEDA-COR/2011-12/01571 dated September 12, 2011.

Accordingly, in view of the finalisation of the procedure for classification of wind power projects into wind zones class by MEDA, the same shall form the basis for determination of applicable Tariff for wind power projects falling under particular wind zone class and the same shall be applicable for the Wind power projects to be commissioned in FY 2012-13.

2.11. LEVELLISED TARIFF FOR NEW WIND ENERGY PROJECTS IN FY 2012-13

Accordingly, the generic tariffs for Wind Energy Projects for FY 2012-13 have been determined as under. The discount factor for carrying out levelisation of Tariff for wind energy projects works out to 15.39%.

Tariff for New RE Projects for FY 2012-13- Wind

Wind Energy	Tariff Period	Levellised Tariff for FY 2012-13	Benefits of Accelerated Depreciation (if availed)	Net Levellised Tariff upon adjusting for Accelerated Depreciation Benefit) (if availed)
		Rs/kWh	Rs/kWh	Rs/kWh
WindZone-1	13	5.49	0.79	4.70
WindZone-2	13	4.78	0.69	4.09
WindZone-3	13	4.07	0.59	3.48
WindZone-4	13	3.66	0.53	3.13

Notes:

- The above Tariff shall be valid for Projects Commissioned in FY 2012-13.
- The above Tariff shall be valid for a Tariff Period of 13 years from the Commercial Operation Date (COD).

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 Projects under Regulation 2.1 (ff) of the RE Tariff Regulations is 35 years from COD.

3.2. TARIFF PERIOD

Regulation 6.1 of the RE Tariff Regulations specifies a Tariff Period of 13 years for Small Hydro Projects of capacities above 5 MW and lower than or equal to 25 MW.

Regulation 6.2 of the RE Tariff Regulations specifies a Tariff Period of 35 years for Mini/Micro Hydro projects and Small hydro projects upto and including 5 MW. The Tariff Period matches the useful life in case of these Projects, reflecting a longer preferential treatment for such Projects.

3.3. CAPITAL COST OF SMALL HYDRO PROJECTS

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

The RE Tariff Regulations provide for indexed capital cost to be notified on a yearly basis pursuant to issuance of such indexed Capital Cost by CERC for small hydro projects in accordance with indexation mechanism stipulated under CERC RE Tariff Regulations.

As the first Control Period for CERC RE Tariff Regulations 2009 is valid only till March 2012, CERC is in the process of finalisation of RE Regulations for the next Control Period (i.e., FY 2012-13 to FY 2016-17). The CERC has proposed the same indexation mechanism to determine the capital cost for each year of the next Control Period as specified in its existing CERC RE Regulations 2009. Since, Regulation 29 of the RE Tariff Regulations specifies that the indexation mechanism as stipulated under CERC RE Tariff Regulations 2009 has to be considered for determination of capital cost for SHP projects, the Commission has derived the capital cost based on the indexation formula for the SHP projects to be commissioned in FY 2012-13 as was considered in the earlier Orders in line with CERC RE Tariff Regulations, 2009.

While arriving at the index for capital cost norm for FY 2012-13 for the SHP projects in Maharashtra, the Commission has considered the indices related information for the period of 11 months during calendar year 2011 starting from January 2011 to November 2011. Besides, in accordance with the RE Tariff Regulations, the calendar year 2009 has been considered as the base year. Accordingly, the indexed capital cost for small hydro power projects to be commissioned during FY 2012-13 works out to Rs 552.21 Lakh/MW for small hydro projects with installed capacity (> 1 MW and upto and including 5 MW) and Rs 502.41 Lakh/MW for small hydro projects with installed capacity (> 5 MW to 25 MW) as summarised under the following table:

Capital Cost Indexation for Small Hydro Power Projects (FY2012-13)

Indexation Formulation
CC(n)=P&M(n)*[1+F1+F2+F3]
dn = (a*(SIn-1/SI0)-1)+b*(EIn-1/EI0)-1))/(a+b)
P&M(n)=P&M(0)*(1+dn)

Variable	Description	Value
a	Weightage for Steel Index	0.6
b	Weightage for Electrical Machinery Index	0.4
F_1	Factor for Land and Civil Work	0.16
F_2	Factor for Erection and Commissioning	0.10
F_3	Factor for IDC and Financing	0.14

Month/Year	E&M		Iron & Steel	
	2011	2009	2011	2009
January	125.10	124.60	143.70	118.00
Febuary	125.10	124.50	145.50	118.00
March	126.40	123.90	146.10	117.20
April	127.20	123.60	144.20	124.00
May	127.60	123.80	141.80	124.30
June	128.00	123.70	142.50	122.20
July	128.70	123.70	142.50	123.10
August	129.20	123.70	142.10	125.30
September	130.90	120.30	142.80	131.40
October	131.00	120.70	142.60	130.80
November	130.70	120.50	142.80	131.70
December		120.40		131.60
Average	**128.17**	**122.78**	**143.33**	**124.80**

Parameter	Description	< 5MW	5MW - 25MW
$CC_{(0)}$(RsL/MW)	Capital Cost for the Base Year	499.00	454.00
$P\&M_{(0)}$ (RsL/MW)	Plant & Machinery Cost for the Base Year	356.43	324.29
dn	Capital Cost Escalation Factor	10.66%	10.66%
$P\&M_{(n)}$ (RsL/MW)	**Plant & Machinery Cost for the nth Year (FY 2012-13)**	**394.43**	**358.86**
$CC_{(n)}$ (RsL/MW)	**Capital Cost for the nth Year (FY2012-13)**	**552.21**	**502.41**

3.4. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the RE Tariff Regulations, the debt and equity component for FY 2012-13 for SHP having capacities above 1MW and up to and including 5MW works out to Rs. 386.55 Lakh and Rs. 165.66 Lakh, respectively, and for projects having capacities above 5 MW and lower than or equal to 25 MW, the debt and

equity component works out to Rs. 351.69 Lakh / MW and Rs. 150.72 Lakh / MW, respectively.

3.5. RETURN ON EQUITY

In accordance with Regulation 16 of the RE Tariff Regulations, the RoE works out as shown in the Table below:

Particulars	**> 1 MW and upto and including 5 MW**	**> 5 MW to 25 MW**
Opening Equity (in Rs lakh / MW)	165.66	150.72
Return on Equity for the first 10 years @19% (Rs lakh / MW)	31.48	28.64
Return on Equity after first 10 years @24% (Rs lakh / MW)	39.76	36.17

3.6. INTEREST ON LOAN

As explained in Paragraph 1.4 of this Order, the interest rate of 12.56% (9.56% +300 basis points) has been considered for small hydro projects having capacities above 1MW and up to and including 5MW with a gross opening loan amount of Rs. 386.55 Lakh / MW and for projects having capacities above 5 MW and lower than or equal to 25 MW with a gross opening loan amount of Rs. 351.69 Lakh / MW in FY 2012-13.

3.7. DEPRECIATION

In accordance with Regulation 15 of the RE Tariff Regulations, the depreciation will be charged at 7% for the first 10 years, and at 0.80% thereafter for the remaining useful period of 25 years for SHPs.

3.8. INTEREST ON WORKING CAPITAL

Regulation 17 of the RE Tariff Regulations provides for computation of the working capital requirements of the SHPs as under:

"(a) Operation & Maintenance expenses for one month;
(b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;
(c) Maintenance spares @ 15% of operation and maintenance expenses"

Further, as explained above in Paragraph 1.5 of this Order, Interest on Working Capital shall be computed at an interest rate equivalent to average Base Rate of State Bank of India during the previous year plus 250 basis points, i.e., 12.06% (9.56% + 250 basis points).

3.9. OPERATION AND MAINTENANCE (O&M) EXPENSES

Regulation 32 of the RE Tariff Regulations provide for the normative O&M expenses for small hydro projects for FY 2010-11, to be escalated at the rate of 5.72% per annum over the Tariff Period for determination of the levelised tariff. Accordingly, the table below presents the normative O&M expenses considered by the Commission for small hydro power for FY 2012-13:

Project Size	**O&M expenses (Rs Lakh/MW)**
> 1 MW and up to and including 5 MW	20.08
5 MW to 25 MW	14.18

3.10. CAPACITY UTILISATION FACTOR (CUF)

In accordance with Regulation 30 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 31 of the RE Tariff Regulations, the 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 reproduced below:

> *"33.1 Tariff for Mini/Micro Hydro Projects shall be higher by Rs 0.50/kWh* ***or such other higher amount as may be stipulated by Commission from time to time*** *over and above the tariff applicable for Small Hydro Projects with installed capacity more than 1 MW but upto and including 5 MW." (****Emphasis Added****)*

In pursuance of Regulation 33.1 of the RE Tariff Regulations and in order to encourage deployment of Mini/Micro Hydro power projects, while determining the generic tariff for the second year of the Control Period in the Tariff Order dated April 29, 2011 in Case No 39 of 2011, the Commission has further categorised small hydel projects below 1 MW into two sub categories, viz., a) above 500 kW and up to and including 1 MW at single location, and b) 500 kW & below at single location. Further, in view of the lack of economies of scale associated with such small hydel projects, the Commission has provided preferential tariff incentive for Mini/Micro Hydel projects below 500 kW. Accordingly, in line with the principle outlined under earlier Order, the Commission hereby determines the tariff for such sub-categories of Mini/Micro Hydro Projects for FY 2012-13 as under:

a) Tariff for Mini/Micro Hydro Projects above 500 kW and up to and including 1 MW at single location shall be higher by Rs 0.50/kWh over and above the tariff applicable for Small Hydro Projects with installed capacity more than 1 MW but upto and including 5 MW.
b) Tariff for Mini/Micro Hydro Projects of capacity 500 kW and below at single location shall be higher by Rs 1.00/kWh over and above the tariff applicable for Small Hydro Projects with installed capacity more than 1 MW but upto and including 5 MW.

3.13. LEVELLISED TARIFF FOR NEW SMALL HYDRO PROJECTS IN FY 2012-13

In light of the above parameters and the discount factor worked out as 15.57% for levelisation of tariff for SHPs, the generic tariffs for Small Hydro Projects for FY 2012-13 have been determined as under:

Tariff for New RE Projects-Small Hydro Projects, Mini and Micro Hydro Projects

Small Hydro Power	Tariff Period	Levelised Tariff (FY 2012-13)	Benefit of Accelerated Depreciation (if availed)	Net Levelised Tariff (upon adjusting for accelerated depreciation benefit) (if availed)
		(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Mini and Micro Hydro				
500 kW and below	35	5.65	0.59	5.06
Above 500 kW and upto and including 1 MW	35	5.15	0.59	4.56
Other SHP				
Above 1 MW and upto and including 5 MW	35	4.65	0.59	4.06
5 MW to 25 MW	13	3.98	0.54	3.44

Notes:

- The above Tariff shall be valid for Projects commissioned in FY 2012-13.
- The above Tariff shall be valid for a tariff period of 35 years from their Commercial Operation Date (COD) for Projects less than and including 5 MW, and for 13 years for Projects with installed capacity greater than 5 MW and upto and including 25 MW

4. BIOMASS POWER PROJECTS

4.1. KEY PROVISIONS OF RE TARIFF REGULATIONS

In accordance with the RE Tariff Regulations, the applicable Tariff and terms and conditions of Tariff for new as well as existing Biomass Power Projects as specified under existing RE Tariff Order shall continue to be applicable for the first three years of the new

Control Period (i.e., FY 2010-11, FY 2011-12, and FY 2012-13). The relevant extract of Regulation 3.3 of the RE Tariff Regulations is reproduced as under:

"3.3 For existing and new projects based on renewable energy technologies having fuel cost component, like biomass power projects and non-fossil fuel based co-generation projects, the tariff, tariff structure and other conditions as specified under respective RE Tariff Order shall continue to be applicable for first three years of the Control Period, i.e., FY 2010-11, FY 2011-12 and FY 2012-13".

Further, Chapter 5 of the RE Tariff Regulations provides technology specific norms for determination of tariff for Biomass Power Projects and the same shall be applicable to new Biomass Projects only from the fourth year of the Control Period, i.e., from FY 2013-14. The relevant Regulations specifying the applicability of such norms is reproduced as under:

"35.1 The capital cost and performance norms as specified under Regulation 36 to Regulation 40 shall be applicable only for new biomass power projects with effect from April 1, 2013.

35.2 The fuel related aspects specified under Regulation 41 to Regulation 47 shall be applicable for existing and new biomass power projects with effect from April 1, 2013:

Provided that norms in respect of Station Heat Rate, Gross Calorific Value and Auxiliary Consumption factor for existing biomass power projects shall be as stipulated under the respective RE tariff Order as referred under Regulation 3.2."

In addition, the Regulations also specify that the fuel price for each year of operation, of both existing and new Biomass Projects shall be adjusted based on an indexation mechanism with effect from April 1, 2013. The relevant extract of the Regulations is reproduced as under:

"47.1 In case of (existing and new) biomass power projects, the following indexing mechanism for adjustment of fuel prices for each year of operation, from April 1, 2013, will be applicable for determination of applicable variable charge component of tariff:

The indexed Biomass Fuel Price (Pn) in case of Biomass Power projects for each year (n) of the Control Period shall be notified pursuant to notification of such indexed Biomass Fuel Price norm as applicable for Biomass Power projects within Maharashtra by Central Electricity Regulatory Commission in accordance with indexation mechanism stipulated under CERC RE Tariff Regulations.

Where,

P (n) = Price per ton of biomass for the nth year to be considered for tariff determination"

Thus, in accordance with the above mentioned provisions of the RE Tariff Regulations, the Tariff for existing and new Biomass Power Projects in FY 2012-13 shall be as per the Biomass Tariff Order already issued by the Commission.

4.2. RELEVANT BIOMASS TARIFF ORDERS

The Commission has issued several Orders for determination of Tariff of Biomass Power Projects as well as for revising the variable component of the Tariffs to factor in the increase in biomass price over the years. The Orders issued by the Commission in respect of Tariff for Biomass Projects and their applicability are as under:

a) Order dated August 8, 2005 in Case No. 37 of 2003 for determination of tariff and dispensation of related issues in respect of procurement of power from biomass based power projects. This Order was applicable to all biomass based power generation projects in Maharashtra using the Rankine cycle based technology applications and commissioned by March 31, 2010, or until installed plant capacity based on biomass reaches 250 MW, whichever is earlier. This Order was applicable only to those Projects harnessing biomass potential in Maharashtra and commissioned in the State, and intended for sale of electricity to Licensees within Maharashtra.

b) Subsequently, the Commission issued Orders for revision of Variable Charge component of Tariff on March 25, 2009 and thereafter on December 14, 2009 (Case No. 83 of 2008) upon scrutiny of submissions of few operational biomass power projects. As stipulated in the Order dated December 14, 2009, the revised variable charge component was applicable till March 31, 2010.

c) The applicability of the tariffs as determined thorough the above Orders was subsequently extended till the issuance of new Tariff Orders for the next Control Period (FY 2010-11 to FY 2014-15) through an Order dated March 31, 2010 in Case No. 116 of 2009.

In accordance with Regulation 3.3 of the RE Tariff Regulations, and on the basis of the Tariff, Tariff Structure and other conditions as stipulated in the existing Tariff Order, the Tariff for existing and new Biomass Power Projects during FY 2012-13 shall be as under.

4.3. TARIFF FOR EXISTING AND NEW BIOMASS POWER PROJECTS

Tariff for Existing and New Biomass Power Projects

Financial Year	Fixed Charge (Rs/kWh)	Variable Charge (Rs/kWh)	Tariff (Rs/kWh)
2012-13	1.70	3.28	4.98

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 biomass power project to distribution licensees within Maharashtra during FY 2012-13.

5. NON-FOSSIL FUEL BASED CO-GENERATION PROJECT

5.1. KEY PROVISIONS OF RE TARIFF REGULATIONS

In accordance with the RE Tariff Regulations, the applicable Tariff and terms and conditions of Tariff for new as well as existing non-fossil fuel based co-generation projects as specified under existing RE Tariff Order shall continue to be applicable for first three years of the new Control Period (i.e., FY 2010-11, FY 2011-12, and FY 2012-13). The relevant extract of Regulation 3.3 of the RE Tariff Regulations, is reproduced as under:

"3.3 For existing and new projects based on renewable energy technologies having fuel cost component, like biomass power projects and non-fossil fuel based co-

generation projects, the tariff, tariff structure and other conditions as specified under respective RE Tariff Order shall continue to be applicable for first three years of the Control Period, i.e., FY 2010-11, FY 2011-12 and FY 2012-13".

Further, Chapter 6 of the RE Tariff Regulations provides technology specific norms for determination of tariff for non-fossil fuel based co-generation projects and the same are applicable to existing and new non-fossil fuel based co-generation projects only from the fourth year of the Control Period, i.e., from FY 2013-14. The relevant Regulations specifying the applicability of such norms is reproduced as under.

"49.1 The capital cost and performance norms as specified under Regulation 50 to Regulation 54 and Regulation 62 shall be applicable only for new non-fossil fuel based co-generation projects with effect from April 1, 2013.

49.2 The fuel related aspects specified under Regulation 55 to Regulation 61 shall be applicable for existing and new biomass power projects with effect from April 1, 2013:

Provided that norms in respect of specific fuel consumption, Gross Calorific Value and Auxiliary Consumption factor for existing non-fossil fuel based co-generation projects shall be as stipulated under the respective RE tariff Order as referred under Regulation 3.2."

In addition, the Regulations also specify that the fuel price for each year of operation, of both existing and new non-fossil fuel based co-generation projects shall be adjusted based on an indexation mechanism with effect from April 1, 2013. The relevant extract of the Regulations is as reproduced as under:

"56.1 In case of (existing and new) non-fossil fuel based co-generation projects, the following indexing mechanism for adjustment of fuel prices for each year of operation, from April 1, 2013, will be applicable for determination of applicable variable charge component of tariff:

The indexed Bagasse Fuel Price (Pn) in case of Non-fossil fuel based Co-generation projects for each year (n) of the Control Period shall be notified pursuant to notification of such indexed Bagasse Fuel Price norm as applicable for Non-fossil fuel based Co-generation projects within Maharashtra by Central

Electricity Regulatory Commission in accordance with indexation mechanism stipulated under CERC RE Tariff Regulations.

Where,

P (n) = Price per ton of Bagasse for the nth year to be considered for tariff determination"

Thus, the Tariff for existing and new non-fossil fuel based co-generation projects in FY 2012-13 shall be as per the relevant Tariff Order for non-fossil fuel based co-generation projects as already issued by the Commission.

5.2. RELEVANT TARIFF ORDERS FOR NON-FOSSIL FUEL BASED CO-GENERATION

The Commission has issued Orders for determination of Tariff of non-fossil fuel based co-generation projects as well as for revising the variable cost component of Tariffs to factor in the fuel price increase over the years, as under:

a) Order dated August 16, 2002 in Case No. 8/9/10/15/17/18/19/20/21 of 2001 for purchase of power from non-fossil fuel based co-generation projects and in the matter of aiding the State Government in formulation of the Policy. The Tariff Rate and tariff structure, as approved, were valid till March 31, 2007 or 300 MW of capacity addition, whichever is earlier. Subsequently, through RPS Order (Case No. 6 of 2006), the Commission extended the validity of the Tariff Rate, tariff structure and other conditions of said Order for co-generation projects to be commissioned upto March 31, 2010.

b) The Commission issued a Clarificatory Order dated November 21, 2003 specifying the qualification criteria for co-generation projects and outlining the measurement and verification protocol for compliance monitoring.

c) Subsequently, the Commission issued an Interim Order for review of tariff rate and tariff structure for non-fossil fuel based grid connected Cogeneration projects on January 11, 2010 (Case No. 123 of 2008) upon scrutiny of submissions made by Cogeneration Association of India.

In accordance with Regulation 3.3 of the RE Tariff Regulations, and on the basis of the Tariff, Tariff Structure and other conditions as stipulated in the existing Tariff Order, the Tariff for existing and new non-fossil fuel based co-generation projects during FY 2012-13 shall be as elaborated below.

5.3. TARIFF FOR EXISTING AND NEW NON-FOSSIL FUEL BASED CO-GENERATION PROJECTS

Tariff for Existing and New Non-Fossil based Bagasse Cogen Power Projects

Financial Year	Fixed Charge (Rs/kWh)	Variable Charge (Rs/kWh)	Tariff (Rs/kWh)
2012-13	2.26	2.53	4.79

The Tariff Rate comprises of 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 project to distribution licensees within Maharashtra during FY 2012-13.

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

In accordance with the RE Tariff Regulations, the applicable Tariff and terms and conditions of Tariff for new as well as existing non-qualifying non-fossil fuel based co-generation projects as specified under existing RE Tariff Order shall continue to be applicable for the first three years of the new Control Period (i.e., FY 2010-11, FY 2011-12, and FY 2012-13). The relevant extract of Regulation 3.3 of the RE Tariff Regulations is reproduced as under:

"3.3 For existing and new projects based on renewable energy technologies having fuel cost component, like biomass power projects and non-fossil fuel based co-generation projects, the tariff, tariff structure and other conditions as specified under respective RE Tariff Order shall continue to be applicable for first three years of the Control Period, i.e., FY 2010-11, FY 2011-12 and FY 2012-13".

In this context, the Commission has determined the Tariff for non-qualifying non-fossil fuel based co-generation (NQNFFC) projects as Rs 1.94/kWh with escalation of 2% per annum on compounded basis under its Order (Case 26 of 2004) dated May 25, 2005. Accordingly, the Tariff Rate for existing non-qualifying non-fossil fuel based co-generation projects for FY 2012-13 works out to Rs 2.23/kWh.

6. SOLAR PHOTOVOLTAIC (PV) PROJECTS

6.1. USEFUL LIFE

Regulation 2.1 (ff) 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 date of commercial operation (COD) till such time as specified under the RE Tariff Regulations for such generation facility. Accordingly, as per Regulation 2.1 (ff), the useful life specified for Solar PV Projects is 25 years.

6.2. CONTROL PERIOD

The generic tariff determined for Solar PV projects based on the Capital Cost and other norms applicable for FY 2011-12 the vide Commission's Order dated April 29, 2011 shall also apply for such projects during FY 2012-13, provided that (i) the Power Purchase Agreements (PPA) in respect of the Solar PV projects as mentioned in this Paragraph are signed on or before March 31, 2012; and (ii) the entire capacity covered by the Power Purchase Agreements is commissioned on or before March 31, 2013 in respect of Solar PV projects.

Further, for those Solar photovoltaic power projects whose PPAs are signed after March 31, 2012, the tariff for such projects for their commissioning during FY 2012-13 would be based on the benchmark capital cost norm for Solar PV power projects for FY 2012-13 as specified under Paragraph 6.4 of this Order, which is in line with the revised capital cost norm for such Solar PV power projects as stipulated by the Central Electricity Regulatory Commission under its Draft RE Tariff Regulations issued on November 18, 2011.

6.3. TARIFF PERIOD

Regulation 6 of the RE Tariff Regulations, specifies the Tariff Period for Solar PV projects as 25 years. In terms of Regulation 6.4 and 6.5 of the RE Tariff Regulations, the Tariff Period specified shall be reckoned from the date of commercial operation 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

As stated earlier, as the first Control Period for CERC RE Tariff Regulations 2009 is valid only till March 2012, CERC is in the process of finalisation of RE Regulation for the next Control Period (i.e., FY 2012-13 to FY 2016-17). CERC, in its draft RE Tariff Regulations for the next Control Period issued on November 18, 2011 for public consultation has proposed the capital cost for Solar PV power projects to be commissioned in FY 2012-13 as Rs 1000 Lakh/ MW.

The above capital cost norm shall also apply for Solar PV projects in Maharashtra for FY 2012-13, provided PPAs are signed after March 31, 2011 and solar PV project is commissioned during FY 2012-13.

6.5. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the RE Tariff Regulations, the normative debt and equity component for Solar PV Projects shall be Rs. 700 Lakh / MW and Rs. 300 Lakh / MW, respectively.

6.6. RETURN ON EQUITY

In accordance with Regulation 16.1 of the RE Tariff Regulations, the RoE for Solar PV Projects works out as shown in the Table below:

Particulars	**Solar PV**
Opening Equity (in Rs lakh / MW)	300
Return on Equity for the first 10 years @ 19% (in Rs lakh / MW)	57

Particulars	Solar PV
Return on Equity after first 10 years @24% (in Rs lakh / MW)	72

6.7. INTEREST ON LOAN

As explained in Paragraph 1.4 of this Order, the interest rate of 12.56% (9.56% + 300 basis points) has been considered for Solar PV Projects for loan amount of Rs. 700 Lakh / MW in FY 2012-13.

6.8. DEPRECIATION

In accordance with Regulation 15 of the RE Tariff Regulations, the depreciation will be charged at 7% for the first 10 years and at 1.33% thereafter for the remaining useful period of 15 years for Solar PV projects.

6.9. INTEREST ON WORKING CAPITAL

Regulation 17.1 of the RE Tariff Regulations provides for computation of the working capital requirements for Solar PV Projects as under:

"(a) Operation & Maintenance expenses for one month;
(b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;
(c) Maintenance Spares @ 15% of operation and maintenance expenses"

Further, as explained above in Paragraph 1.5 of this Order, Interest on Working Capital shall be computed at an interest rate equivalent to average Base Rate of State Bank of India during the previous year plus 250 basis points, i.e., 12.06% (9.56% + 250 basis points).

6.10. OPERATION AND MAINTENANCE (O&M) EXPENSES

Regulation 68 of the RE Tariff Regulations specifies the normative O&M expenses for Solar PV projects for FY 2010-11 as Rs. 9.51 Lakh/MW, which is to be escalated at the rate of 5.72% per annum over the Tariff Period, for determination of the levelised tariff.

Accordingly, the O&M expense norm for Solar PV projects for FY 2012-13 has been considered as Rs. 10.63 Lakh/MW.

6.11. CAPACITY UTILISATION FACTOR

In accordance with Regulation 67 of the RE Tariff Regulations, CUF of 19% has been considered for determination of Tariff for Solar PV power projects.

6.12. LEVELISED TARIFF FOR SOLAR PV POWER PROJECTS IN FY 2012-13

In light of the parameters discussed in the preceding paragraphs and with respect to the discount factor of 15.39 % derived based on the methodology stipulated in Paragraph 1.6 of this Order, the generic tariffs for Solar PV Projects for FY 2012-13 have been determined as under:

Tariff for New RE Projects-Solar Power Projects [Refer Regulation 3.1 of RE Tariff Regulations]				
Particulars	Tariff Period	Levelised Tariff (FY 2012-13)	Benefit of Accelerated Depreciation (if availed)	Net Levellised Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
		(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Solar PV	25	10.80	1.61	9.19

The above Tariff shall be applicable for Solar PV Projects wherein PPA are signed after March 31, 2012 and projects are commissioned during FY 2012-13, and shall be valid for a tariff period of 25 years from the Commercial Operation Date (COD).

The Tariff for Solar PV Projects to be commissioned during FY 2012-13, wherein PPA are signed on or before March 31, 2012, shall be as stipulated in the Commission's Generic RE Tariff Order (Case No. 39 of 2011) for RE technologies for the second year of the Control Period, issued on April 29, 2011.

6.13. LEVELLISED TARIFF FOR SOLAR ROOFTOP PV AND OTHER SMALL SOLAR PROJECTS IN FY 2012-13

Regulation 68 of the RE Tariff Regulations specifies that the tariff for Solar Rooftop PV projects and other small solar projects will be Rs 0.50/kWh higher than the Tariff specified for Solar PV projects in the Regulations. Accordingly, the Tariff for such Projects in FY 2012-13 shall be as follows:

Tariff for New Solar Rooftop PV and other small Solar Power Projects

Particular	Tariff Period	Levelised Total Tariff (FY 2012-13)	Benefit of Accelerated Depreciation (if availed)	Net Levelised Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
		(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Solar Power Projects				
Solar rooftop PV and other small solar power Projects	25	11.30	1.61	9.69

The above Tariff shall be applicable for Solar Rooftop PV and other small solar Projects wherein PPA are signed after March 31, 2012 and projects are commissioned during FY 2012-13, and the same shall be valid for a tariff period of 25 years from the Commercial Operation Date (COD).

The Tariff for Solar Rooftop PV and other small solar Projects to be commissioned during FY 2012-13 wherein PPA are signed on or before March 31, 2012, shall be as specified in the Commission's Generic RE Tariff Order (Case No. 39 of 2011) for RE technologies for the second year of the Control Period, issued on April 29, 2011.

7. SOLAR THERMAL PROJECTS

7.1. USEFUL LIFE

Regulation 2.1 (ff) of the RE Tariff Regulations 'useful life' in relation to a Unit of a generating station (including evacuation system) to mean the duration from the date of commercial operation (COD) till such time as specified under the RE Tariff Regulations for such generation facility. Accordingly, as per Regulation 2.1 (ff), the useful life specified for Solar thermal projects is 25 years.

7.2. CONTROL PERIOD

As specified under Regulation 5.2 of the RE Tariff Regulations, the generic tariff determined for Solar thermal projects based on the Capital Cost and other norms for FY 2010-11 shall also apply for such projects to be commissioned during FY 2011-12 and FY 2012-13, provided that (i) the Power Purchase Agreements (PPA) in respect of Solar thermal projects as mentioned in this Paragraph are signed on or before March 31, 2011; and (ii) the entire capacity covered by the Power Purchase Agreements is commissioned on or before March 31, 2013 in respect of such Solar thermal projects.

Further, for those Solar thermal power projects whose PPAs are signed after March 31, 2011, the tariff for such projects for their commissioning during FY 2012-13 would be based on the benchmark capital cost norm for Solar thermal power projects for FY 2012-13 as specified under Paragraph 7.4 of this Order, which is in line with the revised capital cost norm for such Solar thermal power projects as stipulated by the CERC under its Draft RE Tariff Regulations issued on November 18, 2011.

7.3. TARIFF PERIOD

Regulation 6 of the RE Tariff Regulations specifies the Tariff Period for Solar thermal projects as 25 years. In terms of Regulations 6.4 and 6.5 of the RE Tariff Regulations, the Tariff Period specified shall be reckoned from the date of commercial operation 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 PROJECTS

As stated earlier, as the first Control Period for CERC RE Tariff Regulations 2009 is valid only till March 31, 2012, CERC is in the process of finalisation of RE Regulations for the next Control Period (i.e. FY 2012-13 to FY 2016-17). CERC, in its draft RE Tariff Regulation issued on November 18, 2011 for public consultation has proposed the capital cost for the Solar Thermal power projects to be commissioned in FY 2012-13 as Rs 1300 Lakh/ MW.

The above capital cost norm shall also apply for Solar thermal projects in Maharashtra for FY 2012-13, provided PPAs are signed after March 31, 2011 and the solar thermal power project is commissioned during FY 2012-13.

7.5. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the RE Tariff Regulations, the normative debt and equity component for Solar thermal projects shall be Rs. 910 Lakh / MW and Rs. 390 Lakh / MW, respectively.

7.6. RETURN ON EQUITY

In accordance with Regulation 16.1 of the RE Tariff Regulations, the RoE for Solar thermal projects works out as shown in the table below:

Particulars	**Solar Thermal**
Opening Equity (in Rs lakh / MW)	390
Return on Equity for the first 10 years @19% (in Rs lakh / MW)	74.10
Return on Equity after first 10 years @24% (in Rs lakh / MW)	93.60

7.7. INTEREST ON LOAN

As explained in Paragraph 1.4 of this Order, the interest rate of 12.56% (9.56% + 300 basis points) has been considered for determination of Tariff for Solar thermal projects for the normative loan amount of Rs. 910 Lakh / MW in FY 2012-13.

7.8. DEPRECIATION

In accordance with Regulation 15 of the RE Tariff Regulations, the depreciation will be charged at 7% for the first 10 years, and at 1.33% thereafter for the remaining useful period of 15 years for Solar thermal projects.

7.9. INTEREST ON WORKING CAPITAL

Regulation 17.1 of the RE Tariff Regulations, provides for computation of the working capital requirements of the Solar thermal projects as under:

"(a) Operation & Maintenance expenses for one month;
(b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;
(c) Maintenance Spares @ 15% of operation and maintenance expenses"

Further, as explained above in Paragraph 1.5 of this Order, Interest on Working Capital shall be computed at an interest rate equivalent to average Base Rate of State Bank of India during the previous year plus 250 basis points, i.e., 12.06% (9.56% + 250 basis points).

7.10. OPERATION AND MAINTENANCE (O&M) EXPENSES

Regulation 72 of the RE Tariff Regulations specifies the normative O&M expenses for solar thermal power projects for FY 2010-11 as Rs. 13.74 Lakh/MW, to be escalated at the rate of 5.72% per annum over the Tariff Period for determination of the levelised tariff. Accordingly, O&M expenses norm for Solar thermal power projects for FY 2012-13 has been considered as Rs. 15.37 Lakh/MW.

7.11. CAPACITY UTILISATION FACTOR

In accordance with Regulation 72 of the RE Tariff Regulations, CUF of 23% is considered for determination of tariff for solar thermal projects.

7.12. AUXILIARY POWER CONSUMPTION

In accordance with Regulation 74 of the RE Tariff Regulations, the auxiliary power consumption factor for determination of tariff of solar thermal power projects is 10.00%.

7.13. LEVELISED TARIFF FOR SOLAR THERMAL PROJECTS IN FY 2012-13

In light of the parameters discussed in the preceding paragraphs and with respect to the discount factor of 15.39 % derived based on the methodology stipulated in Paragraph 1.6 of this Order, the generic tariff for Solar Thermal Projects for FY 2012-13 has been determined as under:

Tariff for New Solar Thermal Power Project to be commissioned in FY 2012-13

Particular	Tariff Period	Levelised Tariff (FY 2012-13)	Benefit of Accelerated Depreciation (if availed)	Net Levelised Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
		(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Solar Thermal	25	13.02	1.92	11.09

The above Tariff shall be applicable for Solar thermal power Projects wherein PPAs are signed after March 31, 2011 and projects are commissioned during FY 2012-13, and shall be valid for a Tariff Period of 25 years from the Commercial Operation Date (COD).

The Tariff for Solar thermal power projects to be commissioned during FY 2012-13 wherein PPA are signed on or before March 31, 2011, shall be as specified in the Commission's Generic RE Tariff Order (Case No. 39 of 2011) for RE technologies for the second year of the Control Period, issued on April 29, 2011.

8. The detailed computations of the generic tariff for various RE technologies have been annexed with this Order, as per the details given hereunder:

S No	Renewable Energy Projects	Annexure
A	**Wind Power Projects**	
	Wind Zone-I	Annexure 1A
	Wind Zone-II	Annexure 1B
	Wind Zone III	Annexure 1C
	Wind Zone IV	Annexure 1D
B	**Small Hydro Power Projects**	
	SHP Projects Less than 5 MW	Annexure 2A
	SHP Projects between 5 MW and 25 MW	Annexure 2B
C	**Solar Projects**	
	Solar PV Projects	Annexure 3
	Solar Thermal Projects	Annexure 4

9. This Draft Order (*Suo-motu*) is issued to invite comments and suggestions from all stakeholders including RE Developers, Distribution Licensees, Maharashtra Energy Development Agency (MEDA), consumers, etc. All stakeholders may submit their views, comments and suggestions on the same. The Commission shall finalize the Order after taking a view on the submissions received from the stakeholders on the draft Order.

(Vijay L. Sonavane)
Member

(V. P. Raja)
Chairman

Secretary, MERC

Annexure – 1A
(Wind Zone-1)

Form 1.1 Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Wind Zone 1
1	**Power Generation**				
		Capacity			
			Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	20%
			Useful Life	Years	25
2	**Project Cost**				
		Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	516.94
3	**Sources of Fund**				
			Tariff Period	Years	13
		Debt: Equity			
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	361.86
			Total Equity Amout	Rs Lacs	155.08
		Debt Component			
			Loan Amount	Rs Lacs	361.86
			Repayment Period(incld Moratorium)	years	10
			Interest Rate	%	12.56%
		Equity Component			
			Equity amount	Rs Lacs	155.08
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate		15.39%
4	**Financial Assumptions**				
		Fiscal Assumptions			
			Income Tax	%	32.4450%
			MAT Rate (for first 10 years)	%	20.008%
			80 IA benefits	Yes/No	Yes
		Depreciation			
			Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	1.33%
5	**Working Capital**				
		For Fixed Charges			
		O&M Charges		Months	1
		Maintenance Spare	(% of O&M exepenses)		15%
		Receivables for Debtors		Months	2
		Interest On Working Capital		%	12.06%
6	**Operation & Maintenance**				
		power plant (FY12-13)		Rs Lakh	7.68
		Total O & M Expenses Escalation		%	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
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75

Fixed Cost	Unit	Year--->	1	2	3	4	5	6	7	8	9	10	11	12	13	14
O&M Expenses	Rs Lakh		7.68	8.12	8.58	9.07	9.59	10.14	10.72	11.34	11.98	12.67	13.39	14.16	14.97	15.83
Depreciation	Rs Lakh		36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	6.89	6.89	6.89	6.89
Interest on term loan	Rs Lakh		43.19	38.64	34.09	29.55	25.00	20.46	15.91	11.36	6.82	2.27	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		2.61	2.54	2.47	2.40	2.33	2.27	2.20	2.14	2.08	2.02	1.56	1.60	1.64	1.68
Return on Equity	Rs Lakh		29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	37.22	37.22	37.22	37.22
Total Fixed Cost	**Rs Lakh**		**119.13**	**114.95**	**110.80**	**106.67**	**102.58**	**98.52**	**94.49**	**90.49**	**86.53**	**82.61**	**59.07**	**59.88**	**60.73**	**61.62**

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levellise	1	2	3	4	5	6	7	8	9	10	11	12	13	14
O&M expn	Rs/kWh		0.44	0.46	0.49	0.52	0.55	0.58	0.61	0.65	0.68	0.72	0.76	0.81	0.85	0.90
Depreciation	Rs/kWh		2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	0.39	0.39	0.39	0.39
Int. on term loan	Rs/kWh		2.46	2.21	1.95	1.69	1.43	1.17	0.91	0.65	0.39	0.13	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.15	0.14	0.14	0.14	0.13	0.13	0.13	0.12	0.12	0.12	0.09	0.09	0.09	0.10
RoE	Rs/kWh		1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	2.12	2.12	2.12	2.12
Total COG	**Rs/kWh**	**5.49**	**6.80**	**6.56**	**6.32**	**6.09**	**5.86**	**5.62**	**5.39**	**5.16**	**4.94**	**4.72**	**3.37**	**3.42**	**3.47**	**3.52**

Discount Factor			1	0.867	0.751	0.651	0.564	0.489	0.424	0.367	0.318	0.276	0.239	0.207	0.179	0.155
Levellised Tariff	**5.49**	Rs/Unit														

Determination of Accelerated Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	32.445%
Capital Cost	516.94

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	13.65	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	14.89	0.00	0.00
Accelerated Depreciation																					
Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	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%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	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%
Accelrated Deprn.	Rs Lakh	206.78	248.13	49.63	9.93	1.99	0.40	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	193.13	220.84	22.33	-17.37	-25.31	-26.90	-27.22	-27.28	-27.29	-27.29	-27.29	-27.29	-27.29	-27.29	-27.29	-27.29	-27.29	-14.89	0.00	0.00
Tax Benefit	Rs Lakh	62.66	71.65	7.25	-5.64	-8.21	-8.73	-8.83	-8.85	-8.85	-8.86	-8.86	-8.86	-8.86	-8.86	-8.86	-8.86	-8.86	-4.83	0.00	0.00
Energy generation	MU	0.88	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Discounting Factor		1.00	0.93	0.81	0.70	0.61	0.53	0.45	0.39	0.34	0.30	0.26	0.22	0.19	0.17	0.14	0.13	0.11	0.09	0.08	0.07

Levellised benefit	**0.79**	**Rs/Unit**

Annexure – 1B
(Wind Zone-2)

Form 1.1 Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Wind Zone 2
1	**Power Generation**				
		Capacity			
			Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	23%
			Useful Life	Years	25
2	**Project Cost**				
		Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	516.94
3	**Sources of Fund**				
			Tariff Period	Years	13
		Debt: Equity			
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	361.86
			Total Equity Amout	Rs Lacs	155.08
		Debt Component			
			Loan Amount	Rs Lacs	361.86
			Repayment Period(incld Moratorium)	years	10
			Interest Rate	%	12.56%
		Equity Component			
			Equity amount	Rs Lacs	155.08
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate		15.39%
4	**Financial Assumptions**				
		Fiscal Assumptions			
			Income Tax	%	32.4450%
			MAT Rate (for first 10 years)	%	20.008%
			80 IA benefits	Yes/No	Yes
		Depreciation			
			Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	1.33%
5	**Working Capital**				
		For Fixed Charges			
		O&M Charges		Months	1
		Maintenance Spare	(% of O&M exepenses)		15%
		Receivables for Debtors		Months	2
		Interest On Working Capital		%	12.06%
6	**Operation & Maintenance**				
		power plant (FY12-13)		Rs Lakh	7.68
		Total O & M Expenses Escalation		%	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
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01

Fixed Cost	Unit	Year--->	1	2	3	4	5	6	7	8	9	10	11	12	13	14
O&M Expenses	Rs Lakh		7.68	8.12	8.58	9.07	9.59	10.14	10.72	11.34	11.98	12.67	13.39	14.16	14.97	15.83
Depreciation	Rs Lakh		36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	6.89	6.89	6.89	6.89
Interest on term loan	Rs Lakh		43.19	38.64	34.09	29.55	25.00	20.46	15.91	11.36	6.82	2.27	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		2.61	2.54	2.47	2.40	2.33	2.27	2.20	2.14	2.08	2.02	1.56	1.60	1.64	1.68
Return on Equity	Rs Lakh		29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	37.22	37.22	37.22	37.22
Total Fixed Cost	**Rs Lakh**		**119.13**	**114.95**	**110.80**	**106.67**	**102.58**	**98.52**	**94.49**	**90.49**	**86.53**	**82.61**	**59.07**	**59.88**	**60.73**	**61.62**

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levellise	1	2	3	4	5	6	7	8	9	10	11	12	13	14
O&M expn	Rs/kWh		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	0.79
Depreciation	Rs/kWh		1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	0.34	0.34	0.34	0.34
Int. on term loan	Rs/kWh		2.14	1.92	1.69	1.47	1.24	1.02	0.79	0.56	0.34	0.11	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.13	0.13	0.12	0.12	0.12	0.11	0.11	0.11	0.10	0.10	0.08	0.08	0.08	0.08
RoE	Rs/kWh		1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.85	1.85	1.85	1.85
Total COG	**Rs/kWh**	**4.78**	**5.91**	**5.71**	**5.50**	**5.29**	**5.09**	**4.89**	**4.69**	**4.49**	**4.29**	**4.10**	**2.93**	**2.97**	**3.01**	**3.06**

Discount Factor			1	0.867	0.751	0.651	0.564	0.489	0.424	0.367	0.318	0.276	0.239	0.207	0.179	0.155
Levellised Tariff	**4.78**	Rs/Unit														

Determination of Accelerated Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	32.445%
Capital Cost	516.94

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	13.65	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	14.89	0.00	0.00
Accelerated Depreciation																					
Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	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%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	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%
Accelrated Deprn.	Rs Lakh	206.78	248.13	49.63	9.93	1.99	0.40	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	193.13	220.84	22.33	-17.37	-25.31	-26.90	-27.22	-27.28	-27.29	-27.29	-27.29	-27.29	-27.29	-27.29	-27.29	-27.29	-27.29	-14.89	0.00	0.00
Tax Benefit	Rs Lakh	62.66	71.65	7.25	-5.64	-8.21	-8.73	-8.83	-8.85	-8.85	-8.86	-8.86	-8.86	-8.86	-8.86	-8.86	-8.86	-8.86	-4.83	0.00	0.00
Energy generation	MU	1.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01
Discounting Factor		1.00	0.93	0.81	0.70	0.61	0.53	0.45	0.39	0.34	0.30	0.26	0.22	0.19	0.17	0.14	0.13	0.11	0.09	0.08	0.07

Levellised benefit	**0.69**	**Rs/Unit**

Annexure – 1C
(Wind Zone-3)

Form 1.1 Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Wind Zone 3
1	**Power Generation**				
		Capacity			
			Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	27%
			Useful Life	Years	25
2	**Project Cost**				
		Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	516.94
3	**Sources of Fund**				
			Tariff Period	Years	13
		Debt: Equity			
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	361.86
			Total Equity Amout	Rs Lacs	155.08
		Debt Component			
			Loan Amount	Rs Lacs	361.86
			Repayment Period(incld Moratorium)	years	10
			Interest Rate	%	12.56%
		Equity Component			
			Equity amount	Rs Lacs	155.08
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate		15.39%
4	**Financial Assumptions**				
		Fiscal Assumptions			
			Income Tax	%	32.4450%
			MAT Rate (for first 10 years)	%	20.008%
			80 IA benefits	Yes/No	Yes
		Depreciation			
			Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	1.33%
5	**Working Capital**				
		For Fixed Charges			
		O&M Charges		Months	1
		Maintenance Spare	(% of O&M exepenses)		15%
		Receivables for Debtors		Months	2
		Interest On Working Capital		%	12.06%
6	**Operation & Maintenance**				
		power plant (FY12-13)		Rs Lakh	7.68
		Total O & M Expenses Escalation		%	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
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37

Fixed Cost	Unit	Year--->	1	2	3	4	5	6	7	8	9	10	11	12	13	14
O&M Expenses	Rs Lakh		7.68	8.12	8.58	9.07	9.59	10.14	10.72	11.34	11.98	12.67	13.39	14.16	14.97	15.83
Depreciation	Rs Lakh		36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	6.89	6.89	6.89	6.89
Interest on term loan	Rs Lakh		43.19	38.64	34.09	29.55	25.00	20.46	15.91	11.36	6.82	2.27	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		2.61	2.54	2.47	2.40	2.33	2.27	2.20	2.14	2.08	2.02	1.56	1.60	1.64	1.68
Return on Equity	Rs Lakh		29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	37.22	37.22	37.22	37.22
Total Fixed Cost	**Rs Lakh**		**119.13**	**114.95**	**110.80**	**106.67**	**102.58**	**98.52**	**94.49**	**90.49**	**86.53**	**82.61**	**59.07**	**59.88**	**60.73**	**61.62**

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levellise	1	2	3	4	5	6	7	8	9	10	11	12	13	14
O&M expn	Rs/kWh		0.32	0.34	0.36	0.38	0.41	0.43	0.45	0.48	0.51	0.54	0.57	0.60	0.63	0.67
Depreciation	Rs/kWh		1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	0.29	0.29	0.29	0.29
Int. on term loan	Rs/kWh		1.83	1.63	1.44	1.25	1.06	0.86	0.67	0.48	0.29	0.10	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.11	0.11	0.10	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.07	0.07	0.07	0.07
RoE	Rs/kWh		1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.57	1.57	1.57	1.57
Total COG	**Rs/kWh**	**4.07**	**5.04**	**4.86**	**4.68**	**4.51**	**4.34**	**4.17**	**3.99**	**3.83**	**3.66**	**3.49**	**2.50**	**2.53**	**2.57**	**2.61**

Discount Factor			1	0.867	0.751	0.651	0.564	0.489	0.424	0.367	0.318	0.276	0.239	0.207	0.179	0.155
Levellised Tariff	**4.07**	Rs/Unit														

Determination of Accelerated Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	32.445%
Capital Cost	516.94

Years ---------->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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%
Book Depreciation	Rs Lakh	13.65	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29
Accelerated Depreciation																
Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelrated Depm.	Rs Lakh	206.78	248.13	49.63	9.93	1.99	0.40	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	193.13	220.84	22.33	-17.37	-25.31	-26.90	-27.22	-27.28	-27.29	-27.29	-27.29	-27.29	-27.29	-27.29	-27.29
Tax Benefit	Rs Lakh	62.66	71.65	7.25	-5.64	-8.21	-8.73	-8.83	-8.85	-8.85	-8.86	-8.86	-8.86	-8.86	-8.86	-8.86
Energy generation	MU	1.18	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37
Discounting Factor		1.00	0.93	0.81	0.70	0.61	0.53	0.45	0.39	0.34	0.30	0.26	0.22	0.19	0.17	0.14

Levellised benefit	**0.59**	**Rs/Unit**

Annexure – 1D
(Wind Zone-4)

Form 1.1 Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Wind Zone 4
1	**Power Generation**				
		Capacity			
			Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	30%
			Useful Life	Years	25
2	**Project Cost**				
		Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	516.94
3	**Sources of Fund**				
			Tariff Period	Years	13
		Debt: Equity			
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	361.86
			Total Equity Amout	Rs Lacs	155.08
		Debt Component			
			Loan Amount	Rs Lacs	361.86
			Repayment Period(incld Moratorium)	years	10
			Interest Rate	%	12.56%
		Equity Component			
			Equity amount	Rs Lacs	155.08
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate		15.39%
4	**Financial Assumptions**				
		Fiscal Assumptions			
			Income Tax	%	32.4450%
			MAT Rate (for first 10 years)	%	20.008%
			80 IA benefits	Yes/No	Yes
		Depreciation			
			Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	1.33%
5	**Working Capital**				
		For Fixed Charges			
		O&M Charges		Months	1
		Maintenance Spare	(% of O&M exepenses)		15%
		Receivables for Debtors		Months	2
		Interest On Working Capital		%	12.06%
6	**Operation & Maintenance**				
		power plant (FY12-13)		Rs Lakh	7.68
		Total O & M Expenses Escalation		%	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
Installed Capacity	MW		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

Fixed Cost	Unit	Year--->	1	2	3	4	5	6	7	8	9	10	11	12	13	14
O&M Expenses	Rs Lakh		7.68	8.12	8.58	9.07	9.59	10.14	10.72	11.34	11.98	12.67	13.39	14.16	14.97	15.83
Depreciation	Rs Lakh		36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	36.19	6.89	6.89	6.89	6.89
Interest on term loan	Rs Lakh		43.19	38.64	34.09	29.55	25.00	20.46	15.91	11.36	6.82	2.27	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		2.61	2.54	2.47	2.40	2.33	2.27	2.20	2.14	2.08	2.02	1.56	1.60	1.64	1.68
Return on Equity	Rs Lakh		29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	29.47	37.22	37.22	37.22	37.22
Total Fixed Cost	**Rs Lakh**		**119.13**	**114.95**	**110.80**	**106.67**	**102.58**	**98.52**	**94.49**	**90.49**	**86.53**	**82.61**	**59.07**	**59.88**	**60.73**	**61.62**

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levellise	1	2	3	4	5	6	7	8	9	10	11	12	13	14
O&M expn	Rs/kWh		0.29	0.31	0.33	0.35	0.37	0.39	0.41	0.43	0.46	0.48	0.51	0.54	0.57	0.60
Depreciation	Rs/kWh		1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	0.26	0.26	0.26	0.26
Int. on term loan	Rs/kWh		1.64	1.47	1.30	1.12	0.95	0.78	0.61	0.43	0.26	0.09	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.10	0.10	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.06	0.06	0.06	0.06
RoE	Rs/kWh		1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.42	1.42	1.42	1.42
Total COG	**Rs/kWh**	**3.66**	**4.53**	**4.37**	**4.22**	**4.06**	**3.90**	**3.75**	**3.60**	**3.44**	**3.29**	**3.14**	**2.25**	**2.28**	**2.31**	**2.34**

Discount Factor			1	0.867	0.751	0.651	0.564	0.489	0.424	0.367	0.318	0.276	0.239	0.207	0.179	0.155
Levellised Tariff	**3.66**	Rs/Unit														

Determination of Accelerated Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	32.445%
Capital Cost	516.94

Years ---------->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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%
Book Depreciation	Rs Lakh	13.65	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29	27.29
Accelerated Depreciation																
Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelrated Depm.	Rs Lakh	206.78	248.13	49.63	9.93	1.99	0.40	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	193.13	220.84	22.33	-17.37	-25.31	-26.90	-27.22	-27.28	-27.29	-27.29	-27.29	-27.29	-27.29	-27.29	-27.29
Tax Benefit	Rs Lakh	62.66	71.65	7.25	-5.64	-8.21	-8.73	-8.83	-8.85	-8.85	-8.86	-8.86	-8.86	-8.86	-8.86	-8.86
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
Discounting Factor		1.00	0.93	0.81	0.70	0.61	0.53	0.45	0.39	0.34	0.30	0.26	0.22	0.19	0.17	0.14

Levellised benefit	**0.53**	**Rs/Unit**

Annexure – 2A
(SHP above 1 MW and upto and including 5 MW)

1.1 Form Template for (above 5 MW upto 25 MW) Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Maharashtra
					>1 MW up to and including 5 MW
1	**Power Generation**	Capacity			
			Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	30%
			Auxiliary Consumption		1%
			Useful Life	Years	35
2	**Project Cost**	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	552.21
3	**Financial Assumption**				
			Tariff Period	Years	35
		Debt: Equity			
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	387
			Total Equity Amout	Rs Lacs	166
		Debt Component			
			Loan Amount	Rs Lacs	387
			Repayment Period(incld Moratorium)	years	10
			Intrest Rate	%	12.56%
		Equity Component			
			Equity amount	Rs Lacs	165.66
			Return on Equity for first 10 years	% p.a	19%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate (equiv. to WACC) 11th year onwards		15.57%
4	**Financial Assumptions**	Fiscal Assumptions			
			Income Tax	%	32.445%
			MAT Rate (for first 10 years)	%	20.008%
			80 IA benefits	Yes/No	Yes
		Depreciation			
			Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	0.80%
5	**Working Capital**	For Fixed Charges			
		O&M Charges		Months	1
		Maintenance Spare	(% of O&M exepenses)		15%
		Receivables for Debtors		Months	2
		Intrest On Working Capital		%	12.06%
6	**Operation & Maintenance**	O&M Expense	% of base capital cost		
		power plant (FY 12-13)			20.08
		Total O & M Expenses Escalation		%	5.72%

Form 1.2 Form Template for (>1 MW to 5 MW) : 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

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		20.08	21.23	22.44	23.73	25.08	26.52	28.04	29.64	31.33	33.13	35.02	37.02	39.14	41.38	43.75	46.25	48.90	51.69	54.65	57.78	61.08	64.57	68.27	72.17	76.30	80.67	85.28	90.16	95.32	100.77	106.53	112.63	119.07	125.88	133.08
Depreciation	Rs Lakh		38.65	38.65	38.65	38.65	38.65	38.65	38.65	38.65	38.65	38.65	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42
Interest on term loan	Rs Lakh		46.13	41.28	36.42	31.56	26.71	21.85	17.00	12.14	7.28	2.43	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		3.37	3.33	3.29	3.25	3.22	3.19	3.17	3.15	3.13	3.12	2.63	2.73	2.83	2.94	3.06	3.18	3.31	3.45	3.60	3.75	3.91	4.09	4.27	4.46	4.66	4.88	5.11	5.35	5.60	5.87	6.15	6.45	6.77	7.10	7.46
Return on Equity	Rs Lakh		31.48	31.48	31.48	31.48	31.48	31.48	31.48	31.48	31.48	31.48	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76	39.76
Total Fixed Cost	**Rs Lakh**		**139.72**	**135.97**	**132.29**	**128.68**	**125.14**	**121.69**	**118.33**	**115.06**	**111.88**	**108.81**	**81.83**	**83.93**	**86.15**	**88.50**	**90.99**	**93.61**	**96.39**	**99.32**	**102.42**	**105.70**	**109.17**	**112.84**	**116.71**	**120.81**	**125.14**	**129.72**	**134.56**	**139.68**	**145.09**	**150.81**	**156.86**	**163.25**	**170.01**	**177.16**	**184.71**

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levellised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M expn	Rs/kWh		0.77	0.82	0.86	0.91	0.96	1.02	1.08	1.14	1.20	1.27	1.35	1.42	1.50	1.59	1.68	1.78	1.88	1.99	2.10	2.22	2.35	2.48	2.62	2.77	2.93	3.10	3.28	3.47	3.66	3.87	4.09	4.33	4.58	4.84	5.12
Depreciation	Rs/kWh		1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Int. on term loan	Rs/kWh		1.77	1.59	1.40	1.21	1.03	0.84	0.65	0.47	0.28	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	0.00	0.00
Int. on working capital	Rs/kWh		0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.10	0.10	0.11	0.11	0.12	0.12	0.13	0.13	0.14	0.14	0.15	0.16	0.16	0.17	0.18	0.19	0.20	0.21	0.22	0.23	0.24	0.25	0.26	0.27	0.29
RoE	Rs/kWh		1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53
Total COG	**Rs/kWh**	**4.65**	**5.37**	**5.23**	**5.08**	**4.95**	**4.81**	**4.68**	**4.55**	**4.42**	**4.30**	**4.18**	**3.15**	**3.23**	**3.31**	**3.40**	**3.50**	**3.60**	**3.70**	**3.82**	**3.94**	**4.06**	**4.20**	**4.34**	**4.49**	**4.64**	**4.81**	**4.99**	**5.17**	**5.37**	**5.58**	**5.80**	**6.03**	**6.27**	**6.53**	**6.81**	**7.10**

Discount Factor			1	0.865	0.749	0.648	0.561	0.485	0.420	0.363	0.314	0.272	0.235	0.204	0.176	0.152	0.132	0.114	0.099	0.085	0.074	0.064	0.055	0.048	0.041	0.036	0.031	0.027	0.023	0.020	0.017	0.015	0.013	0.011	0.010	0.008	0.007
Levellised Tariff	**4.65**	**Rs/Unit**																																			

Determination of Accelerated Depreciation

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	########
Capital Cost	552.2

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	14.58	29.16	29.16	29.16	29.16	29.16	29.16	29.16	29.16	29.16	29.16	29.16	29.16	29.16	29.16	29.16	29.16	15.90	0.00	0.00	0.00	0.00	0.00	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%	60%	12%	2%	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	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	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%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	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%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelrated Deprn.	Rs Lakh	220.88	265.06	53.01	10.60	2.12	0.42	0.08	0.02	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	206.31	235.90	23.86	-18.55	-27.04	-28.73	-29.07	-29.14	-29.15	-29.16	-29.16	-29.16	-29.16	-29.16	-29.16	-29.16	-29.16	-15.90	0.00	0.00	0.00	0.00	0.00	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	68.53	78.36	7.92	-6.16	-8.98	-9.54	-9.66	-9.68	-9.68	-9.68	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-9.69	-5.28	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
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
Discounting Factor		1.00	0.93	0.80	0.70	0.60	0.52	0.45	0.39	0.34	0.29	0.25	0.22	0.19	0.16	0.14	0.12	0.11	0.09	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01

Levellised benefit	**0.59**	**Rs/Unit**

Annexure – 2B
(above 5 MW to 25 MW)

1.1 Form Template for (above 5 MW upto 25 MW) Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Maharashtra
					above 5 MW to 25 MW
1	**Power Generation**	Capacity			
			Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	30%
			Auxiliary Consumption		1%
			Useful Life	Years	35
2	**Project Cost**	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	502.41
3	**Financial Assumption**				
			Tariff Period	Years	13
		Debt: Equity			
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	352
			Total Equity Amout	Rs Lacs	151
		Debt Component			
			Loan Amount	Rs Lacs	352
			Repayment Period(incld Moratorium)	years	10
			Intrest Rate	%	12.56%
		Equity Component			
			Equity amount	Rs Lacs	150.72
			Return on Equity for first 10 years	% p.a	19%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate (equiv. to WACC) 11th year onwards		15.57%
4	**Financial Assumptions**	Fiscal Assumptions			
			Income Tax	%	32.445%
			MAT Rate (for first 10 years)	%	20.008%
			80 IA benefits	Yes/No	Yes
		Depreciation			
			Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	0.80%
5	**Working Capital**	For Fixed Charges			
		O&M Charges		Months	1
		Maintenance Spare	(% of O&M exepenses)		15%
		Receivables for Debtors		Months	2
		Intrest On Working Capital		%	12.06%
6	**Operation & Maintenance**	O&M Expense power plant (FY 12-13)	% of base capital cost		14.18
		Total O & M Expenses Escalation		%	5.72%

Form 1.2 Form Template for (>5 MW to 25 MW) : 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

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		14.18	14.99	15.85	16.76	17.71	18.73	19.80	20.93	22.13	23.39	24.73	26.15	27.64	29.22	30.89	32.66	34.53	36.50	38.59	40.80	43.13	45.60	48.21	50.97	53.88	56.96	60.22	63.67	67.31	71.16	75.23	79.53	84.08	88.89	93.98
Depreciation	Rs Lakh		35.17	35.17	35.17	35.17	35.17	35.17	35.17	35.17	35.17	35.17	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02
Interest on term loan	Rs Lakh		41.97	37.55	33.14	28.72	24.30	19.88	15.46	11.05	6.63	2.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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		2.87	2.82	2.77	2.72	2.68	2.64	2.60	2.57	2.53	2.51	2.04	2.11	2.19	2.26	2.35	2.43	2.52	2.62	2.72	2.83	2.95	3.07	3.20	3.33	3.48	3.63	3.79	3.96	4.14	4.33	4.53	4.74	4.96	5.20	5.45
Return on Equity	Rs Lakh		28.64	28.64	28.64	28.64	28.64	28.64	28.64	28.64	28.64	28.64	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17	36.17
Total Fixed Cost	**Rs Lakh**		**122.83**	**119.17**	**115.56**	**112.00**	**108.50**	**105.05**	**101.67**	**98.35**	**95.10**	**91.91**	**66.97**	**68.45**	**70.02**	**71.68**	**73.43**	**75.29**	**77.25**	**79.32**	**81.51**	**83.83**	**86.28**	**88.86**	**91.60**	**94.49**	**97.55**	**100.79**	**104.21**	**107.82**	**111.64**	**115.68**	**119.95**	**124.47**	**129.24**	**134.29**	**139.62**

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levellised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M expn	Rs/kWh		0.55	0.58	0.61	0.64	0.68	0.72	0.76	0.80	0.85	0.90	0.95	1.00	1.06	1.12	1.19	1.26	1.33	1.40	1.48	1.57	1.66	1.75	1.85	1.96	2.07	2.19	2.31	2.45	2.59	2.74	2.89	3.06	3.23	3.42	3.61
Depreciation	Rs/kWh		1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Int. on term loan	Rs/kWh		1.61	1.44	1.27	1.10	0.93	0.76	0.59	0.42	0.25	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	0.00	0.00
Int. on working capital	Rs/kWh		0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.12	0.12	0.13	0.13	0.14	0.15	0.15	0.16	0.17	0.17	0.18	0.19	0.20	0.21
RoE	Rs/kWh		1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39
Total COG	**Rs/kWh**	**3.98**	**4.72**	**4.58**	**4.44**	**4.30**	**4.17**	**4.04**	**3.91**	**3.78**	**3.66**	**3.53**	**2.57**	**2.63**	**2.69**	**2.76**	**2.82**	**2.89**	**2.97**	**3.05**	**3.13**	**3.22**	**3.32**	**3.42**	**3.52**	**3.63**	**3.75**	**3.87**	**4.01**	**4.14**	**4.29**	**4.45**	**4.61**	**4.78**	**4.97**	**5.16**	**5.37**

Discount Factor			1	0.865	0.749	0.648	0.561	0.485	0.420	0.363	0.314	0.272	0.235	0.204	0.176	0.152	0.132	0.114	0.099	0.085	0.074	0.064	0.055	0.048	0.041	0.036	0.031	0.027	0.023	0.020	0.017	0.015	0.013	0.011	0.010	0.008	0.007
Levellised Tariff	**3.98**	**Rs/Unit**																																			

Determination of Accelerated Depreciation

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	########
Capital Cost	502.4

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	13.26	26.53	26.53	26.53	26.53	26.53	26.53	26.53	26.53	26.53	26.53	26.53	26.53	26.53	26.53	26.53	26.53	14.47	0.00	0.00	0.00	0.00	0.00	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%	60%	12%	2%	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	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	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%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	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%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelrated Deprn.	Rs Lakh	200.96	241.16	48.23	9.65	1.93	0.39	0.08	0.02	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	187.70	214.63	21.70	-16.88	-24.60	-26.14	-26.45	-26.51	-26.52	-26.53	-26.53	-26.53	-26.53	-26.53	-26.53	-26.53	-26.53	-14.47	0.00	0.00	0.00	0.00	0.00	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	62.35	71.29	7.21	-5.61	-8.17	-8.68	-8.79	-8.81	-8.81	-8.81	-8.81	-8.81	-8.81	-8.81	-8.81	-8.81	-8.81	-4.81	0.00	0.00	0.00	0.00	0.00	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
Discounting Factor		1.00	0.93	0.80	0.70	0.60	0.52	0.45	0.39	0.34	0.29	0.25	0.22	0.19	0.16	0.14	0.12	0.11	0.09	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01

Levellised benefit	**0.54**	**Rs/Unit**

Annexure – 3
(Solar PV)

Form 1.1 Form Template for (Solar PV Power Projects) Parameters Assumptions

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Asumptions
1	**Power Generation**				
		Capacity			
			Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	19.0%
			Useful Life	Years	25
2	**Project Cost**				
		Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	1000
3	**Financial Assumptions**				
			Tariff Period	Years	25
		Debt: Equity			
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	700
			Total Equity Amout	Rs Lacs	300
		Debt Component			
			Loan Amount	Rs Lacs	700.00
			Repayment Period(incld Moratorium)	years	10
			Interest Rate	%	12.56%
		Equity Component			
			Equity amount	Rs Lacs	300.00
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Weighted average of ROE		22.00%
			Discount Rate		15.39%
4	**Financial Assumptions**				
		Fiscal Assumptions			
			Income Tax	%	32.45%
			MAT Rate (for first 10 years)	%	20.01%
			80 IA benefits	Yes/No	Yes
		Depreciation			
			Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	1.33%
			Years for 7% rate		10
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			
		Interest On Working Capital		%	12.06%
7	**Operation & Maintenance**				
		power plant (FY 10-11)		Rs Lakh	9.51
		power plant (FY 12-13)		Rs Lacs	10.63
		Total O & M Expenses Escalation		%	5.72%

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

			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
Discount Factor			1	0.867	0.751	0.651	0.564	0.489	0.424	0.367	0.318	0.276	0.239	0.207	0.179	0.155	0.135	0.117	0.101	0.088	0.076	0.066	0.057	0.049	0.043	0.037	0.032

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		1.66	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		10.63	11.24	11.88	12.56	13.28	14.04	14.84	15.69	16.59	17.54	18.54	19.60	20.72	21.91	23.16	24.48	25.88	27.37	28.93	30.59	32.34	34.18	36.14	38.21	40.39
Depreciation	Rs Lakh		70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33	13.33
Interest on term loan	Rs Lakh		83.54	74.75	65.95	57.16	48.37	39.57	30.78	21.98	13.19	4.40	0.00	0.00	0.00	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 Capit	Rs Lakh		4.84	4.69	4.54	4.40	4.25	4.11	3.97	3.83	3.69	3.56	2.66	2.72	2.77	2.83	2.89	2.96	3.03	3.10	3.18	3.26	3.34	3.43	3.53	3.63	3.74
Return on Equity	Rs Lakh		57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00
Total Fixed Cost	**Rs Lakh**		**226.02**	**217.68**	**209.38**	**201.12**	**192.90**	**184.72**	**176.59**	**168.50**	**160.47**	**152.49**	**106.54**	**107.65**	**108.83**	**110.07**	**111.38**	**112.77**	**114.24**	**115.80**	**117.44**	**119.18**	**121.01**	**122.95**	**125.00**	**127.17**	**129.47**

Levellised COG

Per Unit Cost of Generati	**Unit**	**Levellised**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
O&M expn	Rs/kWh		0.64	0.68	0.71	0.75	0.80	0.84	0.89	0.94	1.00	1.05	1.11	1.18	1.24	1.32	1.39	1.47	1.56	1.64	1.74	1.84	1.94	2.05	2.17	2.30	2.43
Depreciation	Rs/kWh		4.21	4.21	4.21	4.21	4.21	4.21	4.21	4.21	4.21	4.21	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Int. on term loan	Rs/kWh		5.02	4.49	3.96	3.43	2.91	2.38	1.85	1.32	0.79	0.26	0.00	0.00	0.00	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		0.29	0.28	0.27	0.26	0.26	0.25	0.24	0.23	0.22	0.21	0.16	0.16	0.17	0.17	0.17	0.18	0.18	0.19	0.19	0.20	0.20	0.21	0.21	0.22	0.22
RoE	Rs/kWh		3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33
Total COG	**Rs/kWh**	**10.80**	**13.58**	**13.08**	**12.58**	**12.08**	**11.59**	**11.10**	**10.61**	**10.12**	**9.64**	**9.16**	**6.40**	**6.47**	**6.54**	**6.61**	**6.69**	**6.78**	**6.86**	**6.96**	**7.06**	**7.16**	**7.27**	**7.39**	**7.51**	**7.64**	**7.78**

Discount Factor			1	0.867	0.751	0.651	0.564	0.489	0.424	0.367	0.318	0.276	0.239	0.207	0.179	0.155	0.135	0.117	0.101	0.088	0.076	0.066	0.057	0.049	0.043	0.037	0.032

Levellised Tariff	**10.80**	**Rs/Unit**

Determination of Accelerated Depreciation Benefit for Solar PV Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	32.4450%
Capital Cost	1000.0

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	26.40	52.80	52.80	52.80	52.80	52.80	52.80	52.80	52.80	52.80	52.80	52.80	52.80	52.80	52.80	52.80	52.80	28.80	0.00	0.00

Accelerated Depreciation																					
Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	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%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	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%
Accelrated Deprn.	Rs Lakh	400.00	480.00	96.00	19.20	3.84	0.77	0.15	0.03	0.01	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	373.60	427.20	43.20	-33.60	-48.96	-52.03	-52.65	-52.77	-52.79	-52.80	-52.80	-52.80	-52.80	-52.80	-52.80	-52.80	-52.80	-28.80	0.00	0.00
Tax Benefit	Rs Lakh	121.21	138.61	14.02	-10.90	-15.89	-16.88	-17.08	-17.12	-17.13	-17.13	-17.13	-17.13	-17.13	-17.13	-17.13	-17.13	-17.13	-9.34	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
Discounting Factor		1.00	0.93	0.81	0.70	0.61	0.53	0.45	0.39	0.34	0.30	0.26	0.22	0.19	0.17	0.14	0.13	0.11	0.09	0.08	0.07

Levellised benefit	**1.61**	**Rs/Unit**

Annexure – 4
(Solar thermal)

Form 1.1 Form Template for (Solar Thermal Power Projects) Parameters Assumptions

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	**Power Generation**				
		Capacity			
			Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	23.0%
			Auxiliary Consumption Factor	%	10.0%
			Useful Life	Years	25
2	**Project Cost**				
		Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	1300
3	**Sources of Fund**				
			Tariff Period	Years	25
		Debt: Equity			
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	910
			Total Equity Amout	Rs Lacs	390
		Debt Component			
			Loan Amount	Rs Lacs	910.00
			Repayment Period(incld Moratorium)	years	10
			Interest Rate	%	12.56%
		Equity Component			
			Equity amount	Rs Lacs	390.00
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate		15.39%
4	**Financial Assumptions**				
		Economic Assumptions			
			Coal Price Escalation	% p.a	0%
			HSD Price Escalation	% p.a	0%
			Discount Rate	% p.a	15.39%
		Fiscal Assumptions			
			Income Tax	%	32.4450%
			MAT Rate (for first 10 years)	%	20.008%
			80 IA benefits	Yes/No	Yes
		Depreciation			
			Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	1.33%
			Years for 7% rate		10
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			
		Interest On Working Capital		%	12.06%
7	**Operation & Maintenance**				
		power plant (FY12-13)		Rs Lacs	15.37
		Total O & M Expenses Escalation		%	5.72%

Form 1.2 Form Template for (Solar Thermal) - Determination of Tariff Component

Units Generation	Unit	Year--->	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
Net 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

Fixed Cost	Unit	Year--->	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		29.96	31.68	33.49	35.40	37.43	39.57	41.83	44.22	46.75	49.43	52.26	55.24	58.40
Depreciation	Rs Lakh		17.33	17.33	17.33	17.33	17.33	17.33	17.33	17.33	17.33	17.33	17.33	17.33	17.33
Interest on term loan	Rs Lakh		0.00	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		3.75	3.84	3.92	4.02	4.12	4.22	4.34	4.45	4.58	4.71	4.85	5.00	5.15
Return on Equity	Rs Lakh		93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60
Total Fixed Cost	**Rs Lakh**		**144.65**	**146.44**	**148.35**	**150.35**	**152.48**	**154.73**	**157.10**	**159.61**	**162.27**	**165.07**	**168.04**	**171.17**	**174.49**

Levellised COG

Per Unit Cost of Generation	Unit	Levellised	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh		1.65	1.75	1.85	1.95	2.06	2.18	2.31	2.44	2.58	2.73	2.88	3.05	3.22
Depreciation	Rs/kWh		0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Int. on term loan	Rs/kWh		0.00	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		0.21	0.21	0.22	0.22	0.23	0.23	0.24	0.25	0.25	0.26	0.27	0.28	0.28
RoE	Rs/kWh		5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16	5.16
Total COG	**Rs/kWh**	**13.02**	**7.98**	**8.08**	**8.18**	**8.29**	**8.41**	**8.53**	**8.66**	**8.80**	**8.95**	**9.10**	**9.27**	**9.44**	**9.62**

Levellised Tariff	**13.02**	**Rs/Unit**

Determination of Accelerated Depreciation Benefit for Solar Thermal Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	32.4450%
Capital Cost	1300.0

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	34.32	68.64	68.64	68.64	68.64	68.64	68.64	68.64	68.64	68.64	68.64	68.64	68.64	68.64	68.64	68.64	68.64	37.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation																										
Opening	%	100%	60%	12%	2%	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	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	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%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	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%
Accelrated Deprn.	Rs Lakh	520.00	624.00	124.80	24.96	4.99	1.00	0.20	0.04	0.01	0.00	0.00	0.00	0.00	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	485.68	555.36	56.16	-43.68	-63.65	-67.64	-68.44	-68.60	-68.63	-68.64	-68.64	-68.64	-68.64	-68.64	-68.64	-68.64	-68.64	-37.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	157.58	180.19	18.22	-14.17	-20.65	-21.95	-22.21	-22.26	-22.27	-22.27	-22.27	-22.27	-22.27	-22.27	-22.27	-22.27	-22.27	-12.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	0.91	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
Discounting Factor		1.00	0.93	0.81	0.70	0.61	0.53	0.45	0.39	0.34	0.30	0.26	0.22	0.19	0.17	0.14	0.13	0.11	0.09	0.08	0.07	0.06	0.05	0.05	0.04	0.03

Levellised benefit	**1.92**	Rs/Unit