

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
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Case No 39 of 2011

In the matter of
Determination of Generic Tariff for the second 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 V.L. Sonavane, Member

DRAFT ORDER (SUO-MOTU)

Dated: March__, 2011

In exercise of the powers vested under Section 61 read with Section 181 of the Electricity Act 2003 (“EA 2003”), the Commission has notified the Maharashtra Electricity Regulatory Commission (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 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. The RE Tariff Regulations require the Commission to suo-motu determine the Generic Tariff for the RE technologies for which norms have been specified in the said Regulations.

3. Regulation 8.1 of the RE Tariff Regulations specifies as follows :-

“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.”

In accordance with above Regulations, 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. The same is applicable for Renewable Energy Projects to be commissioned in Maharashtra during the first control period, i.e., from April 1, 2010 to March 31, 2011.

The Commission in due discharge of the mandate under Regulation 8.1 of the RE Regulations proceeds to determine the Generic Tariff for RE Technologies for the Second Control Period, i.e., FY 2011-12 through this draft Order and invite comments and suggestion 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 Levellised Tariff, which are common to all type of renewable technologies as specified in the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010.

1.1. CONTROL PERIOD

Regulation 5 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies that the Control Period for determination of tariff for RE

projects shall be five years, starting from the date of notification of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010. The first year of the control period was from April 1, 2010 to March 31, 2011 and the second year of the control period shall be FY 2011-12. 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010).

Further, as stipulated under Regulation 5.2 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the generic tariff determined for Solar PV projects based on the Capital Cost and other norms applicable for FY 2010-11 shall also apply for such projects to be commissioned during FY 2011-12, and 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 the Solar PV projects and Solar thermal projects as mentioned in this Clause 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, 2012 in respect of Solar PV projects and on or before March 31, 2013 in respect of Solar thermal projects.

However, for those Solar photovoltaic power projects and Solar thermal power projects whose PPAs are signed after March 31, 2011, the tariff for such projects for their commissioning during FY 2011-12 would be based on the benchmark capital cost norm for Solar PV and Solar thermal projects for the FY 2011-12 as specified under clause 6.4 and 7.4 respectively of this Order in accordance with the revised capital cost norm for such Solar PV power projects and Solar thermal power projects as has been stipulated by the Central Electricity Regulatory Commission under its Order (Petition no 256/2010(suo-motu) dated November 9, 2010).

1.2. TARIFF STRUCTURE

Regulation 9.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 stipulates that the tariff for RE projects shall be 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 renewable energy 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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. LEVELLISED TARIFF

Levellised Tariff is calculated by carrying out levellisation over useful life of each technology considering the discount factor equivalent to weighted average cost of capital representing 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 13.73% (as explained later in this Order). For equity component (i.e., 30%) rate of Return on Equity (ROE) for the first ten (10) years is 19%, and for 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% (ranging from 21.50% to 22.57% depending on 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.

1.5. SUBSIDY OR INCENTIVE BY THE CENTRAL/STATE GOVERNMENT

Regulation 22 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 33.2175% (30% IT rate + 7.5% surcharge¹ + 3% Education

¹ The Finance bill for FY 2011-12 proposes a reduction of surcharge to 5% from the current level of 7.5%. For the purpose of computations in this Order, surcharge of 7.5% has been considered,

cess) has been considered. For the purpose of determining net depreciation benefits, depreciation @ 5.28% as per straight line method (Book depreciation as per Companies Act, 1956) has been compared with depreciation as per Income Tax rate, i.e., 80% of the written down value method and depreciation for the first year has been calculated at the rate of 50% of 80%, i.e., 40%, assuming the project is capitalized during the second half of the financial year as per proviso (ii) to Regulation 22. Tax benefit has been worked out as per normal tax rate on the net depreciation benefit. Per unit levelled accelerated depreciation benefit has been computed considering the weighted average cost of capital as discounting factor. Detailed computation of benefit of accelerated depreciation in respect of each RE technology has been covered under technology specific sections.

Further, as per the second Proviso under Regulation 22.1 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, in case any Central Government or State Government notification specifically provides for any Generation based Incentive over and above tariff, the same shall not be factored in while determining tariff. Thus, while determining Tariffs for RE projects in this Order, no such incentives have been considered.

1.6. SHARING OF CDM BENEFITS

As per Regulation 21.1 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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.

1.7. APPLICABILITY OF TARIFF ORDER

This Tariff Order shall be applicable for New RE Projects to be commissioned during FY 2011-12 (i.e. from April 1, 2011 to March 31, 2012).

The applicable Tariff Rate, Tariff Structure and other terms and conditions for RE Projects (commissioned on or before March 31, 2011 will be in accordance with the relevant provisions outlined under the Generic RE tariff Order for FY 2010-11 (Case 20 of 2010 dated July 14, 2010) 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 2011-12 based on various renewable energy technologies.

2. WIND ENERGY PROJECTS

2.1. USEFUL LIFE

Regulation 2.1 (ff) of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 for such generation facility. Accordingly, the useful life for wind energy projects as specified under the Regulation 2.1 (ff) is 25 years from COD.

2.2. TARIFF PERIOD

Regulation 6 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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/m² measured at hub height of 50 metres and using new wind turbine generators are eligible for the preferential tariff as determined under the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010. In order to determine the yearly normative Capital Cost for such eligible Wind Energy Projects over the Control Period, the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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.

CERC has issued an Order dated November 9, 2010 for determination of generic levelled tariff for Renewable Energy Sources, under which CERC has stipulated the indexed capital cost for wind power projects to be commissioned during FY 2011-12 as Rs 492 Lakh/MW.

CERC while arriving at indexed capital cost norm for FY 2011-12, has considered indices related information as available for the period of 5 months during calendar year 2010 (i.e. from January 2010 to May 2010). Further, CERC has considered base year related information for the calendar year 2008, in accordance with the CERC Regulations notified during September 2009. However, for the purpose of deriving indexed capital cost norm for FY 2011-12 in the case of Maharashtra, the Commission has considered indices related information for period of 12 months during calendar year 2010 starting from January 2010 to December 2010. Besides, in accordance with the MERC (Terms and Conditions for determination of RE Tariff) notified during June 2010, the calendar year 2009 has been considered as base year. Accordingly, the indexed capital cost for wind energy projects to be commissioned during FY 2011-12 work out as Rs 489.39 Lakh/MW as summarised under following table:

Capital Cost Indexation for Wind Power Projects (FY2011-12)

Indexation Formulation $CC(n)=P\&M(n)*[1+F_1+F_2+F_3]$ $dn = (a*(SI_n-1/SI_0)-1)+b*(EI_n-1/EI_0-1))/(a+b)$ $P\&M(n)=P\&M(0)*(1+dn)$

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	
	2010	2009	2010	2009
January	120.70	124.60	131.40	118.00
February	121.20	124.50	129.00	118.00
March	122.50	123.90	129.00	117.20
April	122.80	123.60	131.60	124.00
May	123.10	123.80	136.50	124.30
June	123.20	123.70	136.60	122.20
July	123.30	123.70	136.00	123.10
August	123.50	123.70	136.10	125.30
September	123.50	120.30	135.50	131.40
October	123.30	120.70	135.90	130.80
November	123.30	120.50	137.60	131.70
December	123.70	120.40	141.60	131.60
Average	122.84	122.78	134.73	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	4.79%
P&M_(n) (RsL/MW)	Plant & Machinery Cost for the nth Year (FY 2011-12)	391.62
CC_(n) (RsL/MW)	Capital Cost for the nth Year (FY2011-12)	489.53

2.4. DEBT-EQUITY RATIO

Regulation 13.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides that the debt-equity ratio of 70:30 is to be considered for determination of generic tariff. In accordance with the debt equity ratio and the above stipulated Capital cost, the debt and equity component for wind energy projects works out to Rs. 342.67 Lakh / MW and Rs. 146.86 Lakh / MW, respectively, for FY 2011-12.

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 2011-12 works out as under:

Opening Equity (Rs lakh / MW)	146.86
Return on Equity for the first 10 years @19% (Rs lakh / MW)	27.90
Return on Equity after first 10 years @24% (Rs lakh / MW)	35.25

2.6. INTEREST ON LOAN

Regulation 14.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 stipulates 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 computation 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.”

Accordingly, the weighted average of SBAR for FY 2010-11 as available till March 15, 2011(i.e., 12.23%) as shown in the Table below, plus 150 basis points, works out to an interest rate of 13.73%, which has been considered for Wind Energy Projects with a gross opening loan amount of Rs. 342.67 Lakh / MW in FY 2011-12.

Period	SBAR
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1-April-2010 to 16-August-2010	11.75%
17-August-2010 to 20-October-2010	12.25%
21-October-2010 to 2-January-2011	12.50%
3-January-2010 to 13-February-2011	12.75%
14-February to 15-March-2011	13.00%
Avg. BPLR or SBAR	12.23%

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

2.7. DEPRECIATION

Regulation 15 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides that depreciation is 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 for the wind energy projects.

2.8. INTEREST ON WORKING CAPITAL

Regulation 17.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 @ 15% of operation and maintenance expenses."

Further, Regulation 17.3 specifies that Interest on Working Capital shall be computed at an interest rate equivalent to average State Bank Advance Rate (SBAR) during the previous year plus 100 basis points. Para 2.6 of this Order shows that average SBAR for FY 2010-11 is 12.23%. Accordingly, the rate of Interest on Working Capital for wind energy projects in FY 2011-12 works out to 13.23% (12.23% + 100 basis points).

2.9. OPERATION AND MAINTENANCE EXPENSES

In accordance with Regulation 27 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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 levellised tariff. Accordingly, the Commission has considered O&M cost norm for wind energy as Rs 7.26 Lakh/MW for FY 2011-12.

2.10. CAPACITY UTILISATION FACTOR

In accordance with Regulation 26 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, is to be considered, provided that the said Schedule may be amended based on inputs provided by C-WET/MNRE.

Further, in response to several representations to facilitate operationalisation of zone-wise tariff for wind power projects, the Commission in its generic RE Tariff Order for FY 2010-11 (Case No. 20 of 2010 dated July 14, 2010) had directed the State Nodal Agency, MEDA to devise suitable procedures in consultation with C-WET/Wind Energy developers and distribution licensees within two months from issuance of the Generic RE tariff Order for first year of the Control Period and also directed to publish such

information on its website on regular basis. However, it is understood that development of such procedures is at an advance stage of finalisation. The Commission directs MEDA to expedite the same.

2.11. LEVELLISED TARIFF FOR NEW WIND ENERGY PROJECTS IN FY 2011-12

Accordingly, the generic tariffs for Wind Energy Projects for FY 2011-12 has been determined as under. The discount factor for carrying out levellisation of Tariff for wind energy projects works out to 16.21%.

Tariff for New RE Projects for FY 2011-12-Wind

Particular	Tariff Period	Levellised Total Tariff (FY2011-12)	Benefit of Accelerated Depreciation (if availed)	Net Levellised Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
		(Rs / kWh)	(Rs/kWh)	(Rs/kWh)
Wind Energy Projects				
Wind Zone -1	13	5.37	(0.81)	4.56
Wind Zone -2	13	4.67	(0.70)	3.96
Wind Zone -3	13	3.97	(0.60)	3.38
Wind Zone -4	13	3.58	(0.54)	3.04

Notes:

- The above Tariff shall be valid for Projects Commissioned in FY 2011-12.
- 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 the Regulation 2.1 (ff) is 35 years from COD.

3.2. TARIFF PERIOD

Regulation 6.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provide for 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 small hydro projects in accordance with indexation mechanism stipulated under CERC RE Tariff Regulations.

CERC has issued an Order dated November 9, 2010 for determination of generic levelled tariff for Renewable Energy Sources, under which CERC has stipulated the indexed capital cost for Small Hydro projects to be commissioned during FY 2011-12 to be Rs 525.97 Lakh/MW for small hydro projects with installed capacity below 5 MW and Rs 478.16 Lakh/MW for small hydro projects with installed capacity from 5 MW to 25 MW.

CERC while arriving at the indexed capital cost norm for FY 2011-12, has considered indices related information available for the period of 5 months during calendar year 2010 (i.e. from January 2010 to May 2010). Further, CERC has considered base year related information for the calendar year 2008, in accordance with the CERC Regulations notified during September 2009. However, for the purpose of deriving indexed capital cost norm for FY 2011-12 in the case of Maharashtra, the Commission has considered indices related information for period of 12 months during calendar year 2010 starting from January 2010 to December 2010. Besides, in accordance with the MERC (Terms and Conditions for determination of RE Tariff) notified during June 2010, the calendar year 2009 has been considered as base year. Accordingly, the indexed capital cost for small hydro power projects to be commissioned during FY 2011-12 work out as Rs 522.80 Lakh/MW for small hydro projects with installed capacity (> 1 MW and upto and including 5 MW) and Rs 475.28 Lakh/MW for small hydro projects with installed capacity (> 5 MW to 25 MW) as summarised under following table:

Capital Cost Indexation for Small Hydro Power Projects (FY2011-12)

Indexation Formulation $CC(n)=P\&M(n)*[1+F_1+F_2+F_3]$ $dn = (a*(SIn-1/SI0)-1)+b*(EIn-1/EI0-1))/(a+b)$ $P\&M(n)=P\&M(0)*(1+dn)$

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	
	2010	2009	2010	2009
January	120.70	124.60	131.40	118.00
February	121.20	124.50	129.00	118.00
March	122.50	123.90	129.00	117.20
April	122.80	123.60	131.60	124.00
May	123.10	123.80	136.50	124.30
June	123.20	123.70	136.60	122.20
July	123.30	123.70	136.00	123.10
August	123.50	123.70	136.10	125.30
September	123.50	120.30	135.50	131.40
October	123.30	120.70	135.90	130.80
November	123.30	120.50	137.60	131.70
December	123.70	120.40	141.60	131.60
Average	122.84	122.78	134.73	124.80

Parameter	Description	> 1 MW and upto and including 5 MW	> 5 MW to 25 MW
CC ₍₀₎ (RsL/MW)	Capital Cost for the Base Year	498.88	453.53
P&M ₍₀₎ (RsL/MW)	Plant & Machinery Cost for the Base Year	356.34	323.95
dn	Capital Cost Escalation Factor	4.79%	4.79%
P&M_(n) (RsL/MW)	Plant & Machinery Cost for the nth Year (FY 2011-12)	373.43	339.48
CC_(n) (RsL/MW)	Capital Cost for the nth Year (FY2011-12)	522.80	475.28

3.4. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the debt and equity component for SHP having capacities above 1MW and up to and including 5MW works out to Rs. 365.96 Lakh and Rs. 156.84 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. 332.69 Lakh / MW and Rs. 142.58 Lakh / MW, respectively.

3.5. RETURN ON EQUITY

In accordance with the Regulation 16 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the RoE works out to be 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)	156.84	142.58
Return on Equity for the first 10 years @19% (Rs lakh / MW)	29.79	27.09
Return on Equity after first 10 years @24% (Rs lakh / MW)	37.64	34.22

3.6. INTEREST ON LOAN

In accordance with Regulation 14 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, as computed above, the interest rate of 13.73% (12.23% +150 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. 365.96 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. 332.69 Lakh / MW.

3.7. DEPRECIATION

In accordance with Regulation 15 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 @ 15% of operation and maintenance expenses"*

Further, in accordance with Regulation 17.3, the Interest on Working Capital for small hydro projects in FY 2011-12 works out to 13.23% (12.23% + 100 basis points).

3.9. OPERATION AND MAINTENANCE EXPENSES

Regulation 32 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 levellised tariff. Accordingly, the table below presents the normative O&M expenses considered by the Commission for small hydro power for FY 2011-12:

Project Size	O&M expenses (Rs Lakh/MW)
> 1 MW and up to and including 5 MW	19.00
5 MW to 25 MW	13.41

3.10. CAPACITY UTILISATION FACTOR (CUF)

In accordance with Regulation 30 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the Normative Auxiliary Consumption of 1.0% has been considered for determination of tariff of SHPs.

3.12. LEVELLISED TARIFF FOR NEW SMALL HYDRO PROJECTS IN FY 2011-12

In light of the above parameters and the discount factor worked out as 16.38% for levellisation of tariff for SHPs, the generic tariffs for Small Hydro Projects for FY 2011-12 have been determined as under:

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

Particulars		Tariff period	Levellised Total Tariff (FY2011-12)	Benefit of Accelerated Depreciation (if availed)	Net Levellised Tariff(upon adjusting for Accelerated Depreciation benefit) (if availed)
		years	(Rs / kWh)	(Rs/kWh)	(Rs/kWh)
Small Hydro Project					
Mini and Micro Hydro Projects	1 MW & below	35	5.01	(0.59)	4.42
Other Small Hydro Projects	above 1 MW & upto and including 5MW	35	4.51	(0.59)	3.92
	above 5 MW & upto and including 25 MW	13	3.87	(0.53)	3.34

- The above Tariff shall be valid for Projects commissioned in FY 2011-12.
- 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

3.13. LEVELLISED TARIFF FOR MINI/MICRO HYDRO PROJECTS IN FY 2011-12

Regulation 33 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies that the tariff for Mini/Micro Hydro Projects 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. Accordingly, the Levellised Tariff for Mini/Micro Hydro Projects in FY 2011-12 with capacity less than 1

MW shall be Rs 5.01 / kWh (Rs 4.51/kWh + Rs 0.50/kWh) and Rs 4.42/kWh (Rs 3.34/kWh + Rs 0.50/kWh) in case benefit of accelerated depreciation are availed.

4. BIOMASS POWER PROJECTS

4.1. KEY PROVISIONS OF RE TARIFF REGULATIONS

In accordance with MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, namely, Regulation 3.3 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides technology specific norms for determination of tariff for Biomass Power Projects and the same shall be applicable to new Biomass Projects only from 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 Project 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 (P_n) 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"

From the above mentioned provisions of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the Tariff for existing and new Biomass Power Projects in FY 2011-12 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.
- b) The 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.
- c) 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.
- d) 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.
- e) The applicability of the tariffs as determined through 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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 2011-12 shall be as elaborated in the following section.

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)
2011-12	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 2011-12.

5. NON-FOSSIL FUEL BASED CO-GENERATION PROJECT

5.1. KEY PROVISIONS OF RE TARIFF REGULATIONS

In accordance with MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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 the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, namely, Regulation 3.3 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 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 (P_n) 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 2011-12 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.
- b) The Tariff Rate and tariff structure, as approved, was 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.
- c) 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.
- d) 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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 2011-12 shall be as elaborated in the following section.

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)
2011-12	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 2011-12.

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

In accordance with MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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 first three years of the new Control Period (i.e., FY 2010-11, FY 2011-12, and FY 2012-13). The relevant extract of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, namely, Regulation 3.3, 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 2011-12 works out to Rs 2.18/kWh.

Hence, the Commission hereby rules that the Tariff Rate for Non-Qualifying non-fossil fuel based Co-generation projects (existing and new) shall be Rs 2.18/kWh.

6. SOLAR PHOTOVOLTAIC (PV) PROJECTS

6.1. USEFUL LIFE

Regulation 2.1 (ff) of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 for such generation facility. Accordingly, as per Regulation 2.1 (ff), the useful life specified for Solar PV Projects shall be 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 2010-11 vide Commission's Order dated July 14, 2010 shall also apply for such projects during FY 2011-12, provided that (i) the Power Purchase Agreements (PPA) in respect of the Solar PV projects as mentioned in this Clause 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, 2012 in respect of Solar PV projects.

Further, for those Solar photovoltaic power projects whose PPAs are signed after March 31, 2011, the tariff for such projects for their commissioning during FY 2011-12 would be based on the benchmark capital cost norm for Solar PV power projects for the FY 2011-12 as specified under clause 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 Order (Petition no 255/2010(suo-motu) dated November 9, 2010.

6.3. TARIFF PERIOD

Regulation 6 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies the Tariff Period for Solar PV projects as 25 years. In terms of Regulation 6.4 and 6.5 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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

Vide its Order dated November 9, 2010, the Central Electricity Regulatory Commission has specified the benchmark capital cost norm for Solar PV projects as Rs. 1442 Lakh/MW for FY 2011-12. Above capital cost norm shall also apply for Solar PV projects in Maharashtra for FY 2011-12, provided PPAs are signed after March 31, 2011 and solar PV project is commissioned during FY 2011-12.

6.5. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the normative debt and equity component for Solar PV Projects shall be Rs. 1009.40 Lakh / MW and Rs. 432.60 Lakh / MW, respectively.

6.6. RETURN ON EQUITY

In accordance with Regulation 16.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the RoE for Solar PV Projects works out as shown in the Table below:

Particulars	Solar PV
Opening Equity (in Rs lakh / MW)	432.60
Return on Equity for the first 10 years @ 19% (in Rs lakh / MW)	82.19
Return on Equity after first 10 years @24% (in Rs lakh / MW)	103.82

6.7. INTEREST ON LOAN

In accordance with Regulation 14 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 and as computed earlier, the interest rate of 13.73%

(12.23% + 150 basis points) has been considered for Solar PV Projects with a gross opening loan amount of Rs. 1009.40 Lakh / MW in FY 2011-12.

6.8. DEPRECIATION

In accordance with Regulation 15 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 @ 15% of operation and maintenance expenses"*

In accordance with Regulation 17.3, the Interest on Working Capital for Solar PV Projects for FY 2011-12 works out to 13.23%.

6.10. OPERATION AND MAINTENANCE EXPENSES

Regulation 68 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides the normative O&M expenses for small 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 levelled tariff. Accordingly, O&M expense norm for Solar PV projects for FY 2011-12 has been considered as Rs. 10.06 Lakh/MW.

6.11. CAPACITY UTILISATION FACTOR

In accordance with Regulation 67 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the CUF of 19% has been considered for determination of Tariff for Solar PV power projects.

6.12. LEVELLISED TARIFF FOR SOLAR PV POWER PROJECTS IN FY 2011-12

In light of the parameters discussed in the preceding paragraphs and with respect to the discount factor of 16.21% derived based on the methodology stipulated in Section 1.4 of this Order, the generic tariffs for Solar PV Projects for FY 2011-12 have been determined as under:

Tariff for New RE Projects-Solar Power Projects

Particular	Tariff period	Levellised Tariff (FY2011-12)	Benefit of Accelerated Depreciation (if availed)	Net Levellised Tariff (upon adjusting for Accelerated Depreciation)
	years	(Rs / kWh)	(Rs/kWh)	(Rs/kWh)
Solar Power Projects				
Solar PV Projects	25	15.61	(2.51)	13.10

Above Tariff shall be applicable for Solar PV Projects wherein PPA are signed after March 31, 2011 and projects are commissioned during FY 2011-12, 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 2011-12 wherein PPA are signed on or before March 31, 2011, shall be as specified in the Commission's Generic RE Tariff Order (Case 20 of 2010) for RE technologies for first year of control period, issued on July 14, 2010.

6.13. LEVELLISED TARIFF FOR SOLAR ROOFTOP PV AND OTHER SMALL SOLAR PROJECTS IN FY 2011-12

Regulation 68 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 2011-12 shall be as follows:

Tariff for New RE Projects-Solar Power Projects [refer Regulation 3.1 of MERC (Terms and conditions of RE tariff) Regulations, 2010]				
Particular	Tariff period	Levelling Tariff (FY2011-12)	Benefit of Accelerated Depreciation (if availed)	Net Levelling Tariff (upon adjusting for Accelerated Depreciation)
	years	(Rs / kWh)	(Rs/kWh)	(Rs/kWh)
Solar Power Projects				
Solar rooftop PV and other small solar power Projects	25	16.11	(2.51)	13.60

Above Tariff shall be applicable for Solar Rooftop PV and other small solar Projects wherein PPA are signed after March 31, 2011 and projects are commissioned during FY 2011-12, 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 2011-12 wherein PPA are signed on or before March 31, 2011, shall be as specified in the Commission's Generic RE Tariff Order (Case 20 of 2010) for RE technologies for first year of control period, issued on July 14, 2010.

7. SOLAR THERMAL PROJECTS

7.1. USEFUL LIFE

Regulation 2.1 (ff) of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 for such generation facility. Accordingly, as per Regulation 2.1 (ff), the useful life specified for Solar thermal projects shall be 25 years.

7.2. CONTROL PERIOD

As stipulated under Regulation 5.2 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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 Clause 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 2011-12 would be based on the benchmark capital cost norm for Solar thermal power projects for the FY 2011-12 as specified under clause 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 Central Electricity Regulatory Commission under its Order (Petition no 255/2010(suo-motu) dated November 9, 2010.

7.3. TARIFF PERIOD

Regulation 6 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies the Tariff Period for Solar thermal projects as 25 years. In terms of Regulations 6.4 and 6.5 of the MERC (Terms and Conditions for determination

of RE Tariff) Regulations, 2010, 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

Vide its Order dated November 9, 2010, the Central Electricity Regulatory Commission has specified the benchmark capital cost norm for Solar thermal projects as Rs. 1500 Lakh/MW for FY 2011-12. Above capital cost norm shall also apply for Solar thermal projects in Maharashtra for FY 2011-12, provided PPAs are signed after March 31, 2011 and the solar thermal power project is commissioned during FY 2011-12.

7.5. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the normative debt and equity component for Solar thermal projects shall be Rs. 1050 Lakh / MW and Rs. 450 Lakh / MW, respectively.

7.6. RETURN ON EQUITY

In accordance with the Regulation 16.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the RoE for Solar thermal projects works out as shown in the table below.

Particulars	Solar Thermal
Opening Equity (in Rs lakh / MW)	450.00
Return on Equity for the first 10 years @19% (in Rs lakh / MW)	85.50
Return on Equity after first 10 years @24% (in Rs lakh / MW)	108.00

7.7. INTEREST ON LOAN

In accordance with Regulation 14 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the interest rate of 13.73% (12.23% + 150 basis points) has been considered for determination of Tariff for Solar thermal projects with a gross opening loan amount of Rs. 1050 Lakh / MW in FY 2011-12.

7.8. DEPRECIATION

In accordance with Regulation 15 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 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 @ 15% of operation and maintenance expenses"*

Further, Regulation 17.3 specifies that Interest on Working Capital shall be computed at an interest rate equivalent to average State Bank Advance Rate (SBAR) during the previous year plus 100 basis points.

Accordingly, the Interest on Working Capital for Solar thermal projects for FY 2011-12 works out to 13.23%.

7.10. OPERATION AND MAINTENANCE EXPENSES

Regulation 73 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides 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 levelled tariff. Accordingly, O&M

expense norm for Solar thermal power projects for FY 2011-12 has been considered as Rs. 14.53 Lakh/MW.

7.11. CAPACITY UTILISATION FACTOR

In accordance with Regulation 72 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the 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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the auxiliary power consumption factor for determination of tariff of solar thermal power projects is 10.00%.

7.13. LEVELLISED TARIFF FOR SOLAR THERMAL PROJECTS IN FY 2011-12

In light of the parameters discussed in the preceding paragraphs and with respect to the discount factor of 16.21% derived based on the methodology stipulated in Section 1.4 of this Order, the generic tariff for Solar Thermal Projects for FY 2011-12 has been determined as under:

Tariff for New RE Projects-Solar Power Projects [refer Regulation 3.1 of MERC (Terms and conditions of RE tariff) Regulations, 2010]				
Particular	Tariff period	Levelling Tariff (FY2011-12)	Benefit of Accelerated Depreciation (if availed)	Net Levelling Tariff (upon adjusting for Accelerated Depreciation)
	years	(Rs / kWh)	(Rs/kWh)	(Rs/kWh)
Solar Power Projects				
Solar Thermal	25	15.24	(2.39)	12.85

Above Tariff shall be applicable for Solar thermal power Projects wherein PPA are signed after March 31, 2011 and projects are commissioned during FY 2011-12, 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 2011-12 wherein PPA are signed on or before March 31, 2011, shall be as specified in the

Commission's Generic RE Tariff Order (Case 20 of 2010) for RE technologies for first year of control period, issued on July 14, 2010.

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.

(V. L. Sonavane)
Member

(V. P. Raja)
Chairman

(K. N. Khawarey)
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%
			Deration Factor	%	0.00%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	489.53
3	Sources of Fund		Tariff Period	Years	13
			<u>Debt: Equity</u>		
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	342.67
			Total Equity Amout	Rs Lacs	146.86
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	342.67
			Moratorium Period	years	0
			Repayment Period(incld Moratorium)	years	10
			Interest Rate	%	13.73%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	147
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		16.21%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.2175%
			80 IA benefits	Yes/No	Yes
			<u>Depreciation</u>		
			Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	1.33%
		Years for 7% rate	10		
5	Working Capital	<u>For Fixed Charges</u>	O&M Charges	Months	1
			Maintenance Spare	(% of O&M exepenses)	15%
			Receivables for Debtors	Months	2
			<u>For Variable Charges</u>		
			Interest On Working Capital	%	13.23%
6	Operation & Maintenance		power plant (FY10-11)		7.26
			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	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		1.75	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	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	15	16	17	18	19	20	21	22	23	24	25	
O&M Expenses	Rs Lakh		7.26	7.68	8.11	8.58	9.07	9.59	10.14	10.72	11.33	11.98	12.66	13.39	14.15	14.96	15.82	16.72	17.68	18.69	19.76	20.89	22.08	23.35	24.68	26.09	27.59	
Depreciation	Rs Lakh		34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27
Interest on term loan	Rs Lakh		44.70	39.99	35.29	30.58	25.88	21.17	16.47	11.76	7.06	2.35	0.00	0.00	0.00	0.00	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		2.80	2.72	2.64	2.56	2.48	2.40	2.32	2.25	2.17	2.10	1.63	1.67	1.71	1.75	1.80	1.85	1.90	1.95	2.01	2.07	2.14	2.21	2.28	2.35	2.43	
Return on Equity	Rs Lakh		27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90
Total Fixed Cost	Rs Lakh		116.93	112.56	108.21	103.89	99.59	95.33	91.09	86.89	82.73	78.60	56.06	56.83	57.63	58.49	59.39	60.34	61.35	62.42	63.54	64.73	65.99	67.33	68.73	70.22	71.79	

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levillise	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		0.41	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	0.95	1.01	1.07	1.13	1.19	1.26	1.33	1.41	1.49	1.57	
Depreciation	Rs/kWh		1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Int. on term loan	Rs/kWh		2.55	2.28	2.01	1.75	1.48	1.21	0.94	0.67	0.40	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Int. on working capital	Rs/kWh		0.16	0.16	0.15	0.15	0.14	0.14	0.13	0.13	0.12	0.12	0.09	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.12	0.12	0.13	0.13	0.13	0.14	
RoE	Rs/kWh		1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	
Total COG	Rs/kWh	5.37	6.67	6.42	6.18	5.93	5.68	5.44	5.20	4.96	4.72	4.49	3.20	3.24	3.29	3.34	3.39	3.44	3.50	3.56	3.63	3.69	3.77	3.84	3.92	4.01	4.10	

Discount Factor			1	0.861	0.740	0.637	0.548	0.472	0.406	0.349	0.301	0.259	0.223	0.192	0.165	0.142	0.122	0.105	0.090	0.078	0.067	0.058	0.050	0.043	0.037	0.032	0.027
Levillised Tariff	5.37	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)	33.2175%
Capital Cost	489.53

Years ----->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%
Book Depreciation	Rs Lakh	12.92	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	14.10	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	195.81	234.97	46.99	9.40	1.88	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

Net Depreciation Benefit	Rs Lakh	182.89	209.13	21.15	-16.45	-23.97	-25.47	-25.77	-25.83	-25.84	-25.85	-25.85	-25.85	-25.85	-25.85	-25.85	-25.85	-25.85	-14.10	0.00	0.00
Tax Benefit	Rs Lakh	60.75	69.47	7.02	-5.46	-7.96	-8.46	-8.56	-8.58	-8.58	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-4.68	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	0.80	0.69	0.59	0.51	0.44	0.38	0.32	0.28	0.24	0.21	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06

Levellised benefit	0.81	Rs/Unit
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**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%	
			Deration Factor	%	0.00%	
			Useful Life	Years	25	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	489.53	
3	Sources of Fund		Tariff Period	Years	13	
			<u>Debt: Equity</u>			
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	342.67	
			Total Equity Amout	Rs Lacs	146.86	
			<u>Debt Component</u>			
			Loan Amount	Rs Lacs	342.67	
			Moratorium Period	years	0	
			Repayment Period(incld Moratorium)	years	10	
			Interest Rate	%	13.73%	
			<u>Equity Component</u>			
			Equity amount	Rs Lacs	147	
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		16.21%				
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.2175%	
			80 IA benefits	Yes/No	Yes	
			<u>Depreciation</u>			
			Depreciation Rate for first 10 years	%	7.00%	
			Depreciation Rate 11th year onwards	%	1.33%	
Years for 7% rate		10				
5	Working Capital		<u>For Fixed Charges</u>			
			O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			<u>For Variable Charges</u>			
Interest On Working Capital	%	13.23%				
6	Operation & Maintenance		power plant (FY10-11)		7.26	
			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	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		2.01	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	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	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		7.26	7.68	8.11	8.58	9.07	9.59	10.14	10.72	11.33	11.98	12.66	13.39	14.15	14.96	15.82	16.72	17.68	18.69	19.76	20.89	22.08	23.35	24.68	26.09	27.59
Depreciation	Rs Lakh		34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53
Interest on term loan	Rs Lakh		44.70	39.99	35.29	30.58	25.88	21.17	16.47	11.76	7.06	2.35	0.00	0.00	0.00	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		2.80	2.72	2.64	2.56	2.48	2.40	2.32	2.25	2.17	2.10	1.63	1.67	1.71	1.75	1.80	1.85	1.90	1.95	2.01	2.07	2.14	2.21	2.28	2.35	2.43
Return on Equity	Rs Lakh		27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25
Total Fixed Cost	Rs Lakh		116.93	112.56	108.21	103.89	99.59	95.33	91.09	86.89	82.73	78.60	56.06	56.83	57.63	58.49	59.39	60.34	61.35	62.42	63.54	64.73	65.99	67.33	68.73	70.22	71.79

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levillise	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		0.36	0.38	0.40	0.43	0.45	0.48	0.50	0.53	0.56	0.59	0.63	0.66	0.70	0.74	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30	1.37
Depreciation	Rs/kWh		1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Int. on term loan	Rs/kWh		2.22	1.98	1.75	1.52	1.28	1.05	0.82	0.58	0.35	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.14	0.13	0.13	0.13	0.12	0.12	0.12	0.11	0.11	0.10	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.12
RoE	Rs/kWh		1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	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
Total COG	Rs/kWh	4.67	5.80	5.59	5.37	5.16	4.94	4.73	4.52	4.31	4.11	3.90	2.78	2.82	2.86	2.90	2.95	2.99	3.04	3.10	3.15	3.21	3.28	3.34	3.41	3.49	3.56

Discount Factor			1	0.861	0.740	0.637	0.548	0.472	0.406	0.349	0.301	0.259	0.223	0.192	0.165	0.142	0.122	0.105	0.090	0.078	0.067	0.058	0.050	0.043	0.037	0.032	0.027
Levillised Tariff	4.67	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)	33.2175%
Capital Cost	489.53

Years ----->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%
Book Depreciation	Rs Lakh	12.92	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	14.10	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	195.81	234.97	46.99	9.40	1.88	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

Net Depreciation Benefit	Rs Lakh	182.89	209.13	21.15	-16.45	-23.97	-25.47	-25.77	-25.83	-25.84	-25.85	-25.85	-25.85	-25.85	-25.85	-25.85	-25.85	-25.85	-14.10	0.00	0.00	
Tax Benefit	Rs Lakh	60.75	69.47	7.02	-5.46	-7.96	-8.46	-8.56	-8.58	-8.58	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-4.68	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	0.80	0.69	0.59	0.51	0.44	0.38	0.32	0.28	0.24	0.21	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	

Levellised benefit	0.70	Rs/Unit
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**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%	
			Deration Factor	%	0.00%	
			Useful Life	Years	25	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	489.53	
3	Sources of Fund		Tariff Period	Years	13	
			<u>Debt: Equity</u>			
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	342.67	
			Total Equity Amount	Rs Lacs	146.86	
			<u>Debt Component</u>			
			Loan Amount	Rs Lacs	342.67	
			Moratorium Period	years	0	
			Repayment Period(incl Moratorium)	years	10	
			Interest Rate	%	13.73%	
			<u>Equity Component</u>			
			Equity amount	Rs Lacs	147	
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		16.21%				
4	Financial Assumptions		<u>Fiscal Assumptions</u>			
			Income Tax	%	33.2175%	
			80 IA benefits	Yes/No	Yes	
			<u>Depreciation</u>			
			Depreciation Rate for first 10 years	%	7.00%	
Depreciation Rate 11th year onwards	%	1.33%				
Years for 7% rate		10				
5	Working Capital		<u>For Fixed Charges</u>			
			O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			<u>For Variable Charges</u>			
Interest On Working Capital	%	13.23%				
6	Operation & Maintenance		power plant (FY10-11)		7.26	
			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	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		2.37	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	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	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		7.26	7.68	8.11	8.58	9.07	9.59	10.14	10.72	11.33	11.98	12.66	13.39	14.15	14.96	15.82	16.72	17.68	18.69	19.76	20.89	22.08	23.35	24.68	26.09	27.59
Depreciation	Rs Lakh		34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53
Interest on term loan	Rs Lakh		44.70	39.99	35.29	30.58	25.88	21.17	16.47	11.76	7.06	2.35	0.00	0.00	0.00	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		2.80	2.72	2.64	2.56	2.48	2.40	2.32	2.25	2.17	2.10	1.63	1.67	1.71	1.75	1.80	1.85	1.90	1.95	2.01	2.07	2.14	2.21	2.28	2.35	2.43
Return on Equity	Rs Lakh		27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25
Total Fixed Cost	Rs Lakh		116.93	112.56	108.21	103.89	99.59	95.33	91.09	86.89	82.73	78.60	56.06	56.83	57.63	58.49	59.39	60.34	61.35	62.42	63.54	64.73	65.99	67.33	68.73	70.22	71.79

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levillise	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		0.31	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	0.71	0.75	0.79	0.84	0.88	0.93	0.99	1.04	1.10	1.17
Depreciation	Rs/kWh		1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Int. on term loan	Rs/kWh		1.89	1.69	1.49	1.29	1.09	0.90	0.70	0.50	0.30	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.12	0.11	0.11	0.11	0.10	0.10	0.10	0.09	0.09	0.09	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10
RoE	Rs/kWh		1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49
Total COG	Rs/kWh	3.97	4.94	4.76	4.57	4.39	4.21	4.03	3.85	3.67	3.50	3.32	2.37	2.40	2.44	2.47	2.51	2.55	2.59	2.64	2.69	2.74	2.79	2.85	2.91	2.97	3.04

Discount Factor			1	0.861	0.740	0.637	0.548	0.472	0.406	0.349	0.301	0.259	0.223	0.192	0.165	0.142	0.122	0.105	0.090	0.078	0.067	0.058	0.050	0.043	0.037	0.032	0.027
Levillised Tariff	3.97	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)	33.2175%
Capital Cost	489.53

Years ----->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%
Book Depreciation	Rs Lakh	12.92	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	14.10	0.00	0.00

Accelerated Depreciation		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Opening	%	100%	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%
Accelerated Depm.	Rs Lakh	195.81	234.97	46.99	9.40	1.88	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

Net Depreciation Benefit	Rs Lakh	182.89	209.13	21.15	-16.45	-23.97	-25.47	-25.77	-25.83	-25.84	-25.85	-25.85	-25.85	-25.85	-25.85	-25.85	-25.85	-25.85	-14.10	0.00	0.00	
Tax Benefit	Rs Lakh	60.75	69.47	7.02	-5.46	-7.96	-8.46	-8.56	-8.58	-8.58	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-4.68	0.00	0.00
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	2.37	2.37	2.37	2.37	2.37	
Discounting Factor		1.00	0.93	0.80	0.69	0.59	0.51	0.44	0.38	0.32	0.28	0.24	0.21	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	

Levellised benefit	0.60	Rs/Unit
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**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%
			Deration Factor	%	0.00%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	489.53
3	Sources of Fund		Tariff Period	Years	13
			<u>Debt: Equity</u>		
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	342.67
			Total Equity Amount	Rs Lacs	146.86
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	342.67
			Moratorium Period	years	0
			Repayment Period(incld Moratorium)	years	10
			Interest Rate	%	13.73%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	147
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		16.21%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.2175%
			80 IA benefits	Yes/No	Yes
			<u>Depreciation</u>		
			Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	1.33%
5	Working Capital		<u>For Fixed Charges</u>		
			O&M Charges	Months	1
			Maintenance Spare	(% of O&M exepenses)	15%
			Receivables for Debtors	Months	2
			<u>For Variable Charges</u>		
Interest On Working Capital	%	13.23%			
6	Operation & Maintenance		power plant (FY10-11)		7.26
			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	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		7.26	7.68	8.11	8.58	9.07	9.59	10.14	10.72	11.33	11.98	12.66	13.39	14.15	14.96	15.82	16.72	17.68	18.69	19.76	20.89	22.08	23.35	24.68	26.09	27.59
Depreciation	Rs Lakh		34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	34.27	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53
Interest on term loan	Rs Lakh		44.70	39.99	35.29	30.58	25.88	21.17	16.47	11.76	7.06	2.35	0.00	0.00	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		2.80	2.72	2.64	2.56	2.48	2.40	2.32	2.25	2.17	2.10	1.63	1.67	1.71	1.75	1.80	1.85	1.90	1.95	2.01	2.07	2.14	2.21	2.28	2.35	2.43
Return on Equity	Rs Lakh		27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	27.90	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25	35.25
Total Fixed Cost	Rs Lakh		116.93	112.56	108.21	103.89	99.59	95.33	91.09	86.89	82.73	78.60	56.06	56.83	57.63	58.49	59.39	60.34	61.35	62.42	63.54	64.73	65.99	67.33	68.73	70.22	71.79

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levillise	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		0.28	0.29	0.31	0.33	0.35	0.36	0.39	0.41	0.43	0.46	0.48	0.51	0.54	0.57	0.60	0.64	0.67	0.71	0.75	0.79	0.84	0.89	0.94	0.99	1.05
Depreciation	Rs/kWh		1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Int. on term loan	Rs/kWh		1.70	1.52	1.34	1.16	0.98	0.81	0.63	0.45	0.27	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
Int. on working capital	Rs/kWh		0.11	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.08	0.08	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.09	0.09
RoE	Rs/kWh		1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34
Total COG	Rs/kWh	3.58	4.45	4.28	4.12	3.95	3.79	3.63	3.47	3.31	3.15	2.99	2.13	2.16	2.19	2.23	2.26	2.30	2.33	2.38	2.42	2.46	2.51	2.56	2.62	2.67	2.73

Discount Factor			1	0.861	0.740	0.637	0.548	0.472	0.406	0.349	0.301	0.259	0.223	0.192	0.165	0.142	0.122	0.105	0.090	0.078	0.067	0.058	0.050	0.043	0.037	0.032	0.027
Levillised Tariff	3.58	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)	33.2175%
Capital Cost	489.53

Years ----->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%
Book Depreciation	Rs Lakh	12.92	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	14.10	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%
Accelerated Deprn.	Rs Lakh	195.81	234.97	46.99	9.40	1.88	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

Net Depreciation Benefit	Rs Lakh	182.89	209.13	21.15	-16.45	-23.97	-25.47	-25.77	-25.83	-25.84	-25.85	-25.85	-25.85	-25.85	-25.85	-25.85	-25.85	-25.85	-14.10	0.00	0.00	
Tax Benefit	Rs Lakh	60.75	69.47	7.02	-5.46	-7.96	-8.46	-8.56	-8.58	-8.58	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-8.59	-4.68	0.00	0.00
Energy generation	MU	1.31	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	
Discounting Factor		1.00	0.93	0.80	0.69	0.59	0.51	0.44	0.38	0.32	0.28	0.24	0.21	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	

Levillised benefit	0.54	Rs/Unit
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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 Capacity Utilization Factor Auxiliary Consumption Deration Factor Useful Life	MW % % % Years	1 30% 1% 0.00% 35
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	522.93
3	Financial Assumption	Debt: Equity	Tariff Period Debt Equity Total Debt Amount Total Equity Amount	Years % % Rs Lacs Rs Lacs	35 70% 30% 366 157
		Debt Component	Loan Amount Moratorium Period Repayment Period(incld Moratorium) Intrest Rate	Rs Lacs years years %	366 0 10 13.73%
		Equity Component	Equity amount Normative ROE (Post-tax) Return on Equity for first 10 years RoE Period Return on Equity 11th year onwards Weighted average of ROE Discount Rate (equiv. to WACC) 11th year onwards	Rs Lacs % % p.a Year % p.a % %	156.88 16% 19% 10 24.00% 22.57% 16.38%
4	Financial Assumptions	Economic Assumptions	Coal Price Escalation HSD Price Escalation Discount Rate	% p.a % p.a % p.a	0 0% 0% 16% 0%
		Fiscal Assumptions	Income Tax 80 IA benefits	% Yes/No	33.2175% Yes
		Depreciation	Depreciation Rate for first 10 years Depreciation Rate 11th year onwards Years for 7% rate	% % %	0.0% 7.00% 0.80% 10
5	Working Capital	For Fixed Charges O&M Charges Maintenance Spare Receivables for Debtors For Variable Charges Intrest On Working Capital	(% of O&M exepenses)	Months Months %	1 15% 2 13.23%
6	Operation & Maintenance	power plant (FY 10-11) Total O & M Expenses Escalation		%	19.00 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		19.00	20.09	21.24	22.45	23.73	25.09	26.53	28.04	29.65	31.34	33.14	35.03	37.04	39.16	41.40	43.76	46.27	48.91	51.71	54.67	57.80	61.10	64.60	68.29	72.20	76.33	80.69	85.31	90.19	95.35	100.80	106.57	112.66	119.11	125.92
Depreciation	Rs Lakh		36.60	36.60	36.60	36.60	36.60	36.60	36.60	36.60	36.60	36.60	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18
Interest on term loan	Rs Lakh		47.75	42.72	37.69	32.67	27.64	22.62	17.59	12.56	7.54	2.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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		3.60	3.55	3.50	3.45	3.40	3.37	3.33	3.30	3.27	3.25	2.74	2.84	2.95	3.06	3.18	3.31	3.45	3.59	3.74	3.90	4.07	4.25	4.44	4.64	4.85	5.07	5.31	5.56	5.82	6.10	6.40	6.71	7.04	7.39	7.76
Return on Equity	Rs Lakh		29.81	29.81	29.81	29.81	29.81	29.81	29.81	29.81	29.81	29.81	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65	37.65
Total Fixed Cost	Rs Lakh		136.76	132.77	128.84	124.98	121.19	117.49	113.86	110.32	106.87	103.52	77.71	79.71	81.82	84.05	86.41	88.91	91.55	94.34	97.29	100.40	103.70	107.19	110.87	114.76	118.88	123.24	127.84	132.70	137.85	143.28	149.03	155.11	161.54	168.33	175.51

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levillised	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		0.73	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	2.78	2.93	3.10	3.28	3.47	3.66	3.87	4.10	4.33	4.58	4.84	
Depreciation	Rs/kWh		1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
Int. on term loan	Rs/kWh		1.84	1.64	1.45	1.26	1.06	0.87	0.68	0.48	0.29	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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		0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.11	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	0.20	0.21	0.22	0.23	0.25	0.26	0.27	0.28	0.30	
RoE	Rs/kWh		1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	
Total COG	Rs/kWh	4.51	5.26	5.10	4.95	4.80	4.66	4.52	4.38	4.24	4.11	3.98	2.99	3.06	3.14	3.23	3.32	3.42	3.52	3.63	3.74	3.86	3.99	4.12	4.26	4.41	4.57	4.74	4.91	5.10	5.30	5.51	5.73	5.96	6.21	6.47	6.75	
Discount Factor			1	0.859	0.738	0.634	0.545	0.468	0.402	0.346	0.297	0.255	0.219	0.188	0.162	0.139	0.120	0.103	0.088	0.076	0.065	0.056	0.048	0.041	0.036	0.031	0.026	0.023	0.019	0.017	0.014	0.012	0.011	0.009	0.008	0.007	0.006	
Levillised Tariff	Rs/Unit	4.51																																				

Determination of Accelerated Depreciation

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	33.2175%
Capital Cost	522.9

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	13.81	27.61	27.61	27.61	27.61	27.61	27.61	27.61	27.61	27.61	27.61	27.61	27.61	27.61	27.61	27.61	27.61	15.06	0.00	0.00	0.00	0.00	0.00	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		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
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%
Accelerated Depm.	Rs Lakh	209.17	251.00	50.20	10.04	2.01	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	0.00	0.00	0.00	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	195.36	223.39	22.59	-17.57	-25.60	-27.21	-27.53	-27.59	-27.61	-27.61	-27.61	-27.61	-27.61	-27.61	-27.61	-27.61	-27.61	-15.06	0.00	0.00	0.00	0.00	0.00	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	64.90	74.21	7.50	-5.84	-8.50	-9.04	-9.14	-9.17	-9.17	-9.17	-9.17	-9.17	-9.17	-9.17	-9.17	-9.17	-9.17	-5.00	0.00	0.00	0.00	0.00	0.00	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	0.68	0.59	0.51	0.43	0.37	0.32	0.28	0.24	0.20	0.17	0.15	0.13	0.11	0.10	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
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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 Capacity Utilization Factor Auxiliary Consumption Deration Factor Useful Life	MW % % % Years	1 30% 1% 0.00% 35
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	475.77
3	Financial Assumption	Debt: Equity	Tariff Period Debt Equity Total Debt Amount Total Equity Amout	Years % % Rs Lacs Rs Lacs	13 70% 30% 333 143
		Debt Component	Loan Amount Moratorium Period Repayment Period(inclد Moratorium) Intrest Rate	Rs Lacs years years %	333 0 10 13.73%
		Equity Component	Equity amount Normative ROE (Post-tax) Return on Equity for first 10 years RoE Period Return on Equity 11th year onwards Weighted average of ROE Discount Rate (equiv. to WACC) 11th year onwards	Rs Lacs % % p.a Year % p.a % %	142.73 16% 19% 10 24.00% 22.57% 16.38%
4	Financial Assumptions	Economic Assumptions	Coal Price Escalation HSD Price Escalation Discount Rate	% p.a % p.a % p.a	0 0% 0% 16% 0%
		Fiscal Assumptions	Income Tax 80 IA benefits	% Yes/No	33.2175% Yes
		Depreciation	Depreciation Rate for first 10 years Depreciation Rate 11th year onwards Years for 7% rate	% % %	0.0% 7.00% 0.80% 10
5	Working Capital	For Fixed Charges	O&M Charges Maintenance Spare Receivables for Debtors	Months (% of O&M exepenses) Months	1 15% 2
		For Variable Charges	Intrest On Working Capital	%	13.23%
6	Operation & Maintenance	power plant (FY 10-11)	Total O & M Expenses Escalation	%	13.41 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	1
Net Generation	MU		2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
O&M Expenses	Rs Lakh		13.41	14.18	14.99	15.85	16.75	17.71	18.72	19.79	20.93	22.12	23.39	24.73	26.14	27.64	29.22	30.89	32.65	34.52	36.50	38.58	40.79	43.12	45.59	48.20	50.96	53.87	56.95	60.21	63.65	67.30	71.14	75.21	79.52	84.06	88.87	
Depreciation	Rs Lakh		33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30	33.30
Interest on term loan	Rs Lakh		43.44	38.87	34.29	29.72	25.15	20.58	16.00	11.43	6.86	2.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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		3.07	3.01	2.95	2.89	2.84	2.78	2.74	2.69	2.65	2.61	2.12	2.20	2.27	2.35	2.44	2.53	2.63	2.73	2.83	2.95	3.07	3.19	3.33	3.47	3.62	3.77	3.94	4.12	4.30	4.50	4.71	4.93	5.16	5.41	5.67	
Return on Equity	Rs Lakh		27.12	27.12	27.12	27.12	27.12	27.12	27.12	27.12	27.12	27.12	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	34.26	
Total Fixed Cost	Rs Lakh		120.34	116.47	112.65	108.88	105.16	101.49	97.89	94.34	90.86	87.44	83.57	79.88	76.47	73.34	70.31	67.33	64.40	61.52	58.69	55.91	53.18	50.50	47.87	45.29	42.76	40.28	37.85	35.47	33.14	30.86	28.63	26.45	24.32	22.24		

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levillised	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		0.52	0.54	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	2.73	2.89	3.06	3.23	3.42
Depreciation	Rs/kWh		1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28
Int. on term loan	Rs/kWh		1.67	1.49	1.32	1.14	0.97	0.79	0.62	0.44	0.26	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.10	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	0.22
RoE	Rs/kWh		1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32
Total COG	Rs/kWh	3.87	4.63	4.48	4.33	4.18	4.04	3.90	3.76	3.63	3.49	3.36	3.24	3.12	3.01	2.91	2.82	2.75	2.68	2.62	2.56	2.51	2.46	2.41	2.36	2.31	2.26	2.21	2.16	2.11	2.06	2.01	1.96	1.91	1.86	1.81	

Discount Factor			1	0.859	0.738	0.634	0.545	0.468	0.402	0.346	0.297	0.255	0.219	0.188	0.162	0.139	0.120	0.103	0.088	0.076	0.065	0.056	0.048	0.041	0.036	0.031	0.026	0.023	0.019	0.017	0.014	0.012	0.011	0.009	0.008	0.007	0.006	
Levillised Tariff	3.87	Rs/Unit																																				

Determination of Accelerated Depreciation

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	33.2175%
Capital Cost	475.8

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	12.56	25.12	25.12	25.12	25.12	25.12	25.12	25.12	25.12	25.12	25.12	25.12	25.12	25.12	25.12	25.12	25.12	13.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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%
Accelerated Depm.	Rs Lakh	190.31	228.37	45.67	9.13	1.83	0.37	0.07	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	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	177.75	203.25	20.55	-15.99	-23.29	-24.76	-25.05	-25.11	-25.12	-25.12	-25.12	-25.12	-25.12	-25.12	-25.12	-25.12	-25.12	-13.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	59.04	67.51	6.83	-5.31	-7.74	-8.22	-8.32	-8.34	-8.34	-8.34	-8.34	-8.34	-8.34	-8.34	-8.34	-8.34	-8.34	-4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	0.68	0.59	0.51	0.43	0.37	0.32	0.28	0.24	0.20	0.17	0.15	0.13	0.11	0.10	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	0.01

Levillised benefit	0.53	Rs/Unit
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**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	Assumptions	
1	Power Generation	<u>Capacity</u>	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	19.0%	
			Deration Factor	%	0.0%	
			Useful Life	Years	25	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	1442	
3	Financial Assumptions		Tariff Period	Years	25	
			<u>Debt: Equity</u>			
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	1009.4	
			Total Equity Amount	Rs Lacs	432.6	
			<u>Debt Component</u>			
			Loan Amount	Rs Lacs	1009.40	
			Moratorium Period	years	0	
			Repayment Period(incl'd Moratorium)	years	10	
			Interest Rate	%	13.73%	
			<u>Equity Component</u>			
			Equity amount	Rs Lacs	432.60	
			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		16.21%				
4	Financial Assumptions		<u>Economic Assumptions</u>			
			Coal Price Escalation	% p.a	0%	
			HSD Price Escalation	% p.a	0%	
			Discount Rate	% p.a	16.21%	
			<u>Fiscal Assumptions</u>			
			Income Tax	%	33.2175%	
			80 IA benefits	Yes/No	Yes	
			<u>Depreciation</u>			
Depreciation Rate for first 10 years	%	7.00%				
Depreciation Rate 11th year onwards	%	1.33%				
Years for 7% rate		10				
5	Working Capital		<u>For Fixed Charges</u>			
			O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			<u>For Variable Charges</u>			
Interest On Working Capital	%	13.23%				
7	Operation & Maintenance		power plant (FY 10-11)	Rs Lacs	10.06	
			<u>Total O & M Expenses Escalation</u>	%	5.72%	

**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	1500
3	Sources of Fund		Tariff Period	Years	25
			<u>Debt: Equity</u>		
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	1050
			Total Equity Amount	Rs Lacs	450
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	1050.00
			Moratorium Period	years	0
			Repayment Period(inclد Moratorium)	years	10
			Interest Rate	%	13.73%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	450.00
			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		16.21%			
4	Financial Assumptions		<u>Economic Assumptions</u>		
			Coal Price Escalation	% p.a	0%
			HSD Price Escalation	% p.a	0%
			Discount Rate	% p.a	16.21%
			<u>Fiscal Assumptions</u>		
			Income Tax	%	33.2175%
			80 IA benefits	Yes/No	Yes
			<u>Depreciation</u>		
			Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	1.33%
Years for 7% rate		10			
5	Working Capital		<u>For Fixed Charges</u>		
			O&M Charges	Months	1
			Maintenance Spare	(% of O&M exepenses)	15%
			Receivables for Debtors	Months	2
			<u>For Variable Charges</u>		
Interest On Working Capital	%	13.23%			
7	Operation & Maintenance		power plant (FY10-11)	Rs Lacs	14.53
			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		28.32	29.94	31.66	33.47	35.38	37.41	39.55	41.81	44.20	46.73	49.40	52.23	55.21
Depreciation	Rs Lakh		20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
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		4.42	4.51	4.60	4.70	4.80	4.91	5.03	5.15	5.28	5.41	5.56	5.71	5.87
Return on Equity	Rs Lakh		108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00
Total Fixed Cost	Rs Lakh		160.74	162.45	164.26	166.16	168.18	170.32	172.57	174.96	177.48	180.14	182.96	185.94	189.09

Levelled COG

Per Unit Cost of Generation	Unit	Levelled	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh		1.56	1.65	1.75	1.85	1.95	2.06	2.18	2.31	2.44	2.58	2.72	2.88	3.04
Depreciation	Rs/kWh		1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
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		0.24	0.25	0.25	0.26	0.26	0.27	0.28	0.28	0.29	0.30	0.31	0.32	0.32
RoE	Rs/kWh		5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96
Total COG	Rs/kWh	15.24	8.86	8.96	9.06	9.16	9.27	9.39	9.52	9.65	9.79	9.93	10.09	10.25	10.43

Levelled Tariff	15.24	Rs/Unit
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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)	33.2175%
Capital Cost	1500.0

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	39.60	79.20	79.20	79.20	79.20	79.20	79.20	79.20	79.20	79.20	79.20	79.20	79.20	79.20	79.20	79.20	79.20	43.20	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%
Accelerated Deprn.	Rs Lakh	600.00	720.00	144.00	28.80	5.76	1.15	0.23	0.05	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	560.40	640.80	64.80	-50.40	-73.44	-78.05	-78.97	-79.15	-79.19	-79.20	-79.20	-79.20	-79.20	-79.20	-79.20	-79.20	-79.20	-43.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	186.15	212.86	21.52	-16.74	-24.39	-25.93	-26.23	-26.29	-26.31	-26.31	-26.31	-26.31	-26.31	-26.31	-26.31	-26.31	-26.31	-14.35	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	0.86	0.69	0.59	0.51	0.44	0.38	0.32	0.28	0.24	0.21	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	0.05	0.05	0.04	0.03	0.03

Levelled benefit	2.39	Rs/Unit
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