

Before the
**MAHARASHTRA ELECTRICITY REGULATORY
 COMMISSION**

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Case No. 6 of 2013

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

Shri V.P. Raja, Chairman

Shri Vijay L. Sonavane, Member

ORDER (SUO-MOTU)

Dated: 22 March , 2013

In exercise of the powers vested under Section 61 read with Section 181 of the Electricity Act 2003 ("EA 2003"), the Maharashtra Electricity Regulatory Commission ("MERC" or "the Commission") has notified the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, ("the RE Tariff Regulations") on 7 June ,

2010. The RE Tariff Regulations provide for Terms and Conditions and the Procedure for determination of generic Tariff on Suo-motu basis in respect of the following Renewable Energy (RE) generating stations:

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

2. Regulation 8.1 of the RE Tariff Regulations requires the Commission to determine the Generic Tariff for the RE technologies for which norms have been specified in the said Regulations on Suo-motu basis, as reproduced below:

“8.1 The Commission shall notify the generic preferential tariff on Suo-motu basis pursuant to issuance of revised norms by Central Electricity Regulatory Commission at the beginning of each year of the Control Period for renewable energy technologies for which norms have been specified under the Regulations.

Provided that for the first year of Control Period, (i.e. FY 2010-11), the generic tariff on Suo-motu basis may be determined within a period not exceeding three months from the date of notification of these Regulations.”

3. Accordingly, the Commission vide Order dated 14 July, 2010, issued an 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. Subsequently, the Commission, vide its Order dated April 29, 2011, issued the Order for the “Determination of Generic Tariff for RE Technologies for the second year of the Control Period, i.e., FY 2011-12” on Suo-motu basis.

4. Further, in accordance with the above Regulations, the Commission, vide Suo-motu Order dated 30 March, 2012 issued the Order for the ‘Determination of Generic Tariff for

RE Technologies for the third year of the Control Period, i.e., FY 2012-13'. The same is applicable for Renewable Energy Projects to be commissioned in Maharashtra during the third year of the control period, i.e., from 1 April, 2012 to 31 March, 2013.

5. Furthermore, in due discharge of the mandate under Regulations 8.1 of the MERC RE Tariff Regulations, the Commission, vide public notice dated 15 January 2013, issued a draft Order for the "Determination of Generic Tariff for RE Technologies for the fourth year of the Control Period, i.e., FY 2013-14" on Suo-motu basis, and invited comments/objections/suggestions from interested stakeholders. The Commission has received written suggestions and objections from various stakeholders.

6. A public hearing was held on 12 February 2013, at 11.30 hours in Centrum Hall, 1st floor, Centre No.1, World Trade Centre, Cuffe Parade, Mumbai 400005. The list of stakeholders who submitted their comments/suggestions in writing or made oral submissions during the public hearing is placed at **Appendix-1** and the list of participants who attended the public hearing is placed at **Appendix-2**.

7. After considering the suggestions and objections received on the draft Order published by the Commission, in due discharge of the mandate under Regulation 8.1 of RE Tariff Regulations, the Commission hereby determines the Generic Tariff of the RE projects for the fourth year of the control period (i.e., FY 2013-14) through this Order based on the financial principles and technology specific parameters as explained in the subsequent sections of the Order.

1. Comments/Objections received and the Commission's Ruling

1.1 Interest on Loan and Interest on Working Capital

Stakeholders Comments/Suggestions

InWEA vide letter dated 8 February 2013 requested the Commission to continue with the methodology adopted in MERC RE Tariff Regulations, 2010, for computation of interest for long term loan and interest on working capital. It submitted that in case the Commission wants to shift from existing methodology then a public process may be started to amend the Regulations. It is unjustifiable to amend the methodology for fixation of Interest rate under "Removal of Difficulties".

Surajbari Windfarm Development Pvt. Ltd. submitted that the Commission has calculated the interest on loan and working capital with a different methodology than as defined in RE Tariff Regulations.

MYTRAH suggested that it will only be appropriate for the Commission to invoke its power under Regulation 77 to remove difficulties and considers the normative interest on long term loan at 13.73%.

IWTMA and Inox Renewable Energy Ltd requested the Commission to consider Interest rate with a spread of 400 basis points to SBI average base rate and that Interest rate on working capital should be 50 basis points above the interest rate on loans. i.e. $13.87\% + 50$ basis points = 14.37% . Stakeholders also requested the Commission to consider IREDA or PFC rate. Orient Green Power Company limited and Kalyani Renewable Energy India Ltd requested the Commission to consider the rate of interest on loan and working capital as 15% to 17%.

Maha Co-Gen Green Power Producers Association vide letter dated 07 February 2013 submitted that term loan interest rate considered by MERC is 12.87% but as per calculations, it works out to 12.22%. This error of Rs 0.04 in calculation may please be rectified. It was further requested to consider the interest rate of at least 14.5% to 15% per annum.

Maharashtra Rajya Sahakari Sakhar Karkhana Sangh Ltd. requested to increase interest rate on loan and working capital from the commercial bank in the range of 14 % to 15% per annum as against 12.87% and 13.37% considered by Commission.

Yash Agro Energy Ltd. and GMT Mining & Power Pvt. Ltd submitted that the actual interest rate from its term lenders is 14.5 – 15.25% pa and actual interest rate on working capital is 14.5 – 15.00% pa which may please be considered.

Commission's Ruling:

The Commission observe that the significant policy shift of BPLR to Base rate for Banks as per RBI guidelines have necessitated the revisions in the basis of specification of interest rate norms. Hence need for change in basis for computation of interest cost norms have been extensively elaborated along with Commission's views in the matter under previous Order (Case No. 10 of 2012). The Commission has continued with similar approach for determining interest cost norms for the purpose of this Order for FY 2013-14. The premise for consideration of interest rate on long term loan and Interest rate on working capital by Commission has been further elaborated along with necessary justification under Para 2.4 and 2.5 of this Order.

1.2 WPI Index:

Stakeholders Comments/Suggestions

Maharashtra Rajya Sahakari Sakhar Karkhana Sangh Ltd. submitted that WPI Index for fuel and power between 2006 to 2011-12 has risen by 140.54%

Torrent Power vide its letter dated 05 February 2013 submitted that Iron & Steel index for the month of October 2012 is 154.90 instead of 153.60 as published on www.eaindustry.nic.in.

MYTRAH Energy (India) Ltd requested the Commission to consider capital cost computation based on the inclusion of WPI for the month of December 2012 and WPI to the date of notification of the final order to make the righteous decision and to arrive at the actual capital cost for FY2013-14 as per indexation formula.

Commission's Ruling:

The Commission notes the comments/suggestion by the objectors and latest data (up to December 12) as available on monthly wholesale price Index for Electrical Machinery and Steel published on www.eaindustry.nic.in has now been considered for capital cost indexation for various renewable energy technologies.

1.3 Return on Equity

Stakeholders Comments/Suggestions

Reliance Power Ltd submitted that developers should be ensured post-tax Return on Equity (RoE) of 16%. Considering the change in MAT rate over past years, the pre-tax Return on Equity should be 20% instead of 19%.

Torrent Power and MYTRAH Energy (India) Limited requested the Commission to consider pre tax RoE of 20% for initial 10 years and 24% from 11th year onwards to cover increasing tax rate which is also in line with CERC RE Tariff Regulation, 2012. Moser Baer requested the Commission to consider a revised rate of return in line with CERC regulation by exercising powers of Commission under “Removal of Difficulties” as specified in regulation 77.1 of MERC RE Tariff Regulation.

MSEDCL submitted that, previously RoE was 16% and investors were satisfied with the financial and economic viability and have invested in the wind projects in the State at such rate of return. Therefore MSEDCL suggested that the Commission may restore the RoE given to wind generators to 16% as per November 24, 2003 Order.

Commission’s Ruling:

Regulation 16 of the MERC RE Tariff Regulations, 2010 specifies the normative RoE for RE projects at 19% pre-tax per annum for the first ten years and after 10 years normative Return on Equity for RE projects is 24% pre-tax per annum. As the said Regulations have been notified after due public consultation process, the Commission is of the view that the scope of present proceedings, is limited to determination of Generic Tariff for the fourth year of the first Control Period under Regulation 8 of the MERC RE Tariff Regulations, 2010.

1.4 State Transmission Charges and Losses:

Stakeholders Comments/Suggestions

Reliance Power Ltd requested that transmission charges and losses should be reimbursed at actual in case renewable energy sources are not available in Maharashtra and the distribution licensee need to purchase renewable energy from outside state in order to meet RPO. Since transmission charges and losses comprise a significant part of the tariff for renewable energy sources, renewable energy developers outside the state need to be incentivized to sell power to distribution licensees of Maharashtra by reimbursing the transmission charges and losses at actual.

Commission's Ruling:

As stipulated in the Regulation 3 of MERC RE Tariff Regulations, the scope of the present proceeding is limited to the RE projects within Maharashtra for generation and sale of electricity from such projects to all distribution licensees within Maharashtra and aspects related to inter-state sale is not the subject matter of the current regulatory process, which has been initiated for determination of Tariff based on provisions outlined under the notified RE Tariff Regulations.

1.5 Clarification on discounting factor for calculation ADD

Stakeholders Comments/Suggestions

Reliance Power Ltd submitted that discount factor calculation for arriving at AD is not very clear and requested the Commission to clarify the same. For example - The discount factor for Wind Project mentioned in the draft Tariff Order is 15.61%. However, the factor applied in the accelerated depreciation benefit sheet is not equivalent to the same.

Commission's Ruling:

Discount factor has been considered equivalent to weighted average cost of capital (WACC) in accordance with Regulation 10.2 of MERC RE Tariff Regulations, 2010. The Commission observes that there is no difference in the rate of discounting, which is 15.61% (equivalent to WACC) as used for the purpose of computation of levellised CoG and levellised AD benefits. However, as AD benefits are computed considering second

half capitalisation in line with Regulation 22.1 (b) of the MERC RE Tariff Regulations, 2010 due to difference in time factor between two consecutive fiscal years, the discount factor varies.

1.6 Depreciation

Stakeholders Comments/Suggestions:

Orient Green Power Company limited requested the Commission to retain existing rate of depreciation while Maharashtra Rajya Sahakari Sakhar Karkhana Sangh Ltd. requested to consider minimum 10% depreciation as against 7% considered by Commission.

Commission's Ruling:

The Commission opines that the consideration of the issue raised by the objector to revise rate of depreciation would entail amendment of RE Tariff Regulations, 2010, is not a subject matter of this present regulatory process, the scope of which is limited to determination of Generic Tariff for the fourth year of the first Control Period under Regulation 8 of the MERC RE Tariff Regulations, 2010.

1.7 Subsidy or incentive by central/ state government and sharing of CDM benefits

Stakeholders Comments/Suggestions:

InWEA vide letter dated 08 February 2013 submitted that it supports the Commission's view that incentives which are provided by the government and which are over and above tariff will not be factored in while estimating Tariff. Also it welcomes the Commission's decision to allow generating company to retain proceeds from carbon credit.

MSEDCL submitted that many wind generators are enjoying CDM benefits. However, the Commission has not made any provision for sharing of these benefits. The Forum of Regulators has recommended that CDM benefits should be shared on gross basis starting from 100% to developers in the first year and thereafter reducing by 10% every year till the sharing becomes equal (50:50) between the developer and the consumer in the sixth year. Thereafter, the sharing of CDM benefits will remain equal till such time as the benefits accrue. MSEDCL submits that Hon'ble Commission may also adopt the same

policy and allow MSEDCL to share the CDM benefits. CERC, Gujarat, Tamil Nadu, Rajasthan and Karnataka are also following the same formula.

Commission's Ruling:

As stipulated in Regulation 22.1 of MERC RE Tariff Regulations, 2010, the Commission observes that it shall take into consideration the incentive or subsidy offered by the Central or State Government while determining the Tariff. The Commission is of the view that in the absence of specific information as regards nature of subsidy, its purpose, eligibility, applicability, concerned parties etc., the Commission is not inclined to pass generic ruling in the matter in the present proceedings. The issue of sharing of such subsidies can be taken up based on application filed by the concerned party.

As regards sharing of CDM benefits, Regulation 21.1 of MERC Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies that all risks, costs and efforts associated with the availing of carbon credits shall be borne by the generating company and entire proceeds of carbon credit from approved CDM project, if any, shall be retained by the generating company. The above Regulations have been finalised after previous publication and extensive consultation process. Further, the issue raised by the objector is not the subject matter of this regulatory process, the scope of which is limited to determination of Generic Tariff for the fourth year of the first Control Period under Regulation 8 of the MERC RE Tariff Regulations, 2010.

1.8 Reactive Energy Charges and Harmonics Penalty

Stakeholders Comments/Suggestions:

GE submitted that it supports reactive power charges at 10 p/kVARh for reactive energy drawal upto 10% of the net energy exported and 25 p/kVARh for drawl in excess of 10% of the net active energy supported.

MSEDCL submitted that in order to maintain grid stability and to restrain the wind power projects from consuming more reactive power from the grid and to encourage them to install suitable compensation devices to limit such reactive power consumption, Commission may levy reactive power charges consistent with the transmission Tariff

Order and added that reactive energy pricing should be uniform for all types of renewable sources.

MSEDCL also submitted that harmonics are distortions in current and voltage waveforms and directly affect the quality of supply. Hence, the Commission may devise a mechanism to penalize the generators for not maintaining the harmonics within the permissible limit as specified in the state grid code.

Commission's Ruling:

As regards the issue of reactive energy charges and harmonics penalty, the Commission is of the view that a detailed technical study and reactive energy compensation is necessary. The Commission had earlier observed that (Ref. Case No. 10 of 2012) MSEDCL may deliberate on the technical issues in the matter of ascertaining impact of harmonics and reactive energy exchange (drawl/injection) for various RE technologies, at forum such as Grid Coordination Committee and MSEDCL was asked to propose suitable action plan. The Commission hereby directs MSEDCL to undertake such technical study and propose its recommendation in consultation with Grid Co-ordination Committee within a period of 4 months from this Order. The issue raised by the stakeholder cannot be addressed as a part of the current regulatory process, which has been initiated for determination of RE Tariff for FY 2013-14 in pursuance of RE Tariff Regulations. The Commission shall deal with this issue through separate regulatory process as and when findings of such technical study are submitted by MSEDCL.

RE source wise comments and Commissions ruling:

Solar Power Plants:

1.9 Capital Cost of Solar PV and Solar Thermal Power Plants

Stakeholders Comments/Suggestions:

Reliance Power Ltd requested the Commission to consider the cost of township as Rs 25 lakhs/MW as part of capital cost for Solar PV and Solar Thermal.

Reliance Power Ltd also requested the Commission to consider module price at \$0.75/Wp while determining the capital cost of Solar PV projects and mentioned that non module

cost for thin film should be 15% higher than crystalline technology. In CERC Suo-motu orders, land requirement is considered at 5 acre / MW for crystalline PV projects as Rs 3.2 lakhs/acre (16 lakhs / MW with land requirement of 5 acres / MW). Land requirement should be considered as 6 acres/ MW for crystalline PV project and 7 acres/MW for thin film technology. The per acre cost of land should be considered at minimum of Rs 10 lakh/acre including CSR and R&R cost. Also in case of private land acquisition, the cost of relocation and rehabilitation (R&R) should be considered, along with the CSR expenditures incurred by the developer. Reliance Power Ltd further submitted that Capital Cost for solar thermal power plants should be increased to Rs. 13.50 cr/MW.

Commission's Ruling:

The Commission has considered the capital cost of solar PV and solar thermal power plants in line with the capital cost determined for such plants by CERC for FY 2013-14 and in accordance with the provisions of MERC RE Tariff Regulations, 2010.

1.10 Operation & Maintenance Expenses of Solar PV and Solar Thermal Plants

Stakeholders Comments/Suggestions:

Reliance Power Ltd submitted that O&M expenses for solar PV plants for FY 2013-14 should be Rs 11.63 lakhs/MW as against Rs 11.23 lakhs/MW and O&M expenses for the solar thermal project should be revised to Rs 18 lakh / MW due to high O&M cost and higher escalation factors

Commission's Ruling:

The Commission observes that the O&M cost for Solar PV and Solar Thermal for FY 2013-14 have been determined in accordance with norms stipulated under Regulation 67 and 72 of the MERC RE Tariff Regulations, 2010. The review of the same cannot be addressed as a part of the current regulatory process, which has been initiated for determination of RE Tariff for FY 2013-14 in pursuance of RE Tariff Regulations.

1.11 Capacity Utilization Factor (CUF) of Solar PV and solar Thermal Plants

Stakeholders Comments/Suggestions:

Reliance Power Ltd submitted that considering the uncertainty in solar resource, CUF should be reduced to 20% as against 23%. CUF of 23% has been based on resource DNI map published by MNRE in 2010. It also submitted that in case the reduction in CUF from 23% to 20% is not accepted, RoE should be suitably increased in order to neutralize the unforeseen incremental risk elements and challenges associated with DNI for the CSP Projects. Reliance Power Limited also requested the Commission to consider the annual degradation in CUF of 3% for first year and 1% thereafter for subsequent years for solar PV projects. Reliance power submitted that for solar thermal plants, annual degradation in CUF of 1% p.a. for the life of project should be considered.

Commission's Ruling:

The Commission observes that the issue of review of CUF norms or revision in RoE norms cannot be addressed as a part of the current regulatory process, which has been initiated for determination of RE Tariff for FY 2013-14 in pursuance of RE Tariff Regulations.

1.12 Policy Review for Solar Power Plants

Stakeholders Comments/Suggestions:

Vidyut Urja Equipments Pvt. Ltd submitted that during the FY 2012-13 no solar project could be initiated because of lack of initiative at Government as well as state obligatory entity (Licensee) levels. It seems there is neither willingness nor mechanism for the Solar Generation power purchase by State Utilities; hence the issuance of Solar Tariff for the FY 2013-14 will also be the exercise without actual projects being installed for the Solar Generation under RPO. Hence, there is need to address this issue positively at State level by the concern agencies and stakeholders, so that there will be sufficient Solar generation in the State to comply the Renewable Purchase Obligation (RPO). MERC in their powers should review the situation and enable wherever the enablement is required.

Commission's Ruling:

The Commission observes that policy review aspects or RE procurement strategy to comply its RPO targets by the Obligated Entity including distribution licensee(s) cannot be addressed through, the present proceedings, which has been initiated for determination of RE Tariff for FY 2013-14 in pursuance of RE Tariff Regulations.

1.13 Control Period and applicability of the Tariff order for solar PV power plants

Stakeholders Comments/Suggestions:

Moser Baer vide letter dated 11 February 2013 submitted that adequate clarity on Control Period and applicability of tariff need to be provided to relevant paragraphs of the draft Order.

Commission's Ruling:

The Commission notes that Para 2.1 of this Order provides necessary clarity on the Control Period and Applicability of the tariff order for Solar PV projects.

1.14 Auxiliary consumption of solar PV power plants

Stakeholders Comments/Suggestions:

Moser Baer vide letter dated 11 February 2013 proposed the consideration of auxiliary consumption at 0.25% of gross energy generation in line with GERC Tariff Order dated 27 January, 2012. It also submitted that sale of power from the plant during day time (export) may not be to the same incumbent distribution licensee from whose network electricity is drawn at night (import). There could be two treatments of this night consumption:

- a. The import during night from the distribution licensee is treated as consumption by industrial consumer to be billed at retail industrial Tariff and payment of net export is made by buyer at preferential tariff.
- b. The import consumption essentially being for generating plant be also treated as auxiliary consumption and netted off against the export during the day.

Thus no payment is required to be made to the distribution licensee for import, which is treated as return of banked energy during day time, and payment of net export is made by buyer at preferential Tariff. The Commission is requested to consider this issue while deciding on auxiliary consumption.

Commission's Ruling:

The Commission observes that the issue of review of performance norms for auxiliary consumption factor and treatment for import of power from the grid by RE projects cannot be addressed as a part of the current regulatory process, which has been initiated for determination of RE Tariff for FY 2013-14 in pursuance of RE Tariff Regulations.

Small Hydro Power Plants:

1.15 Tariffs and Evacuation system cost of small hydro power plants

Stakeholders Comments/Suggestions:

New Asian Infrastructure Development Pvt. Ltd submitted that Tariff needs to be supplemented by Rs. 0.32/KWh for their project (CUF 27.16%) as compared to similar project with 30% C.U.F for which the Suo Motu draft order is planned and interest rate component of evacuation system cost should also be considered. It is also submitted that as per the rulings of Commission, cost of the line is to be borne by MSEDCL or MSETCL and to be paid to promoter in five equal instalments, one year after date of commissioning. Although the cost of transmission line is supposed to be reimbursed to the promoter as per MERC Guidelines, but so far none of the promoters has received the reimbursement from MSEDCL/MSETCL. Even if it is presumed that the cost of evacuation system is reimbursed over a period of six years, the burden of interest on investment is significant. This interest cost has to be added to the capital cost of the project and the revenue accordingly has to be supplemented.

Commission Ruling:

The Commission observes that the capital cost norm specified in accordance with the provisions of the MERC RE Regulations, 2010 already include the cost of evacuation infrastructure up to inter-connection point as defined under the said Regulations. Any disputes in implementation or non-adherence to the terms as outlined under the Order will

have to be addressed through separate proceedings on case to case basis taking into consideration factual matrix of the case.

1.16 Inflation Rate

Stakeholders Comments/Suggestions:

New Asian Infrastructure Development Pvt. Ltd submitted that the rate of inflation in the country is high and is likely to remain high during the entire period of 13 years considered by MERC for working out the levelled Tariff rate. Hence, a consideration of high inflation rate may be given due weightage while working out the Tariff rate for their project.

Commission's Ruling:

The Commission observes that the inflation indices has been considered in line with prevalent wholesale price index (WPI) for applicable parameters and in accordance with the provisions outlined under MERC RE Tariff Regulations.

1.17 Renewable Purchase Obligation

Stakeholders Comments/Suggestions:

Celerity Power vide letter dated 11 February 2013 mentioned that Clause 7.2 of MERC RPO-REC Regulations 2010, mandated that procurement of RE power generated within the state by the distribution licensee at a rate other than approved by the Commission directly from generator or from a trader shall not be considered as eligible quantum for fulfilment of RPO. Celerity Power requested the Commission to delete the word “other than” and amend the same to “any rate”. The market forces will determine the price at which the renewable power will be sold, as the current regulatory price is not viable or not attractive.

Commission's Ruling:

The review of the provisions related to MERC RPO-REC Regulations cannot be addressed as a part of the current regulatory process, which has been initiated for determination of RE Tariff for FY 2013-14 in pursuance of RE Tariff Regulations.

Wind Power Plants:

1.18 Capital cost of Wind Power Plants:

Stakeholders Comments/Suggestions:

ReGen Power tech Pvt. Ltd. mentioned that index calculation for determination of capital cost for wind power plant for FY 2013-14 comes out to be Rs 540.22 lakhs per MW instead of Rs. 538.86 lakhs/MW. However, the association had requested the Commission to increase the capital cost to Rs 625 lakhs/MW.

Inox Renewable Energy Ltd, Kenersys India Private Ltd and Surajbari Windfarm Development Pvt Ltd requested the Commission to consider the base capital cost for the FY 13-14 of at least Rs 600 to Rs 650 lakhs/MW and increase the capital cost from current levels. GE Ltd requested the Commission to consider CERC guidelines for capex.

MYTRAH Energy (India) Ltd requested the Commission to consider capital cost computation based on the inclusion of WPI for December 2012 and WPI to the date of notification of the final order to arrive at the actual Capital Cost for FY2013-14 as per the indexation formula.

MSEDCL submitted that the Commission has recognized change in wind turbine technology and better efficiency in order dated 11 January, 2012. However, the impact of improvement in technology has not been considered while determining generation cost. It is submitted that higher size wind machines may even run at low wind speed and are efficient enough with low CAPEX. Following table submitted by MSEDCL shows the historical and proposed (in draft order) capital cost and O&M cost determined by Commission.

Year	2011	2012	2013	2014 (Draft)	Historical CAGR
Capital Costs (Rs lacs/MW)	467.13	489.53	516.94	538.86	4.88%
O&M Costs (Rs lacs/MW)	6.87	7.26	7.68	8.12	5.72%

MSEDCL submitted that considering the trends and procedure adopted by Hon'ble Commission, Generic Tariff for wind projects shall continue to increase and may not be

affordable to either Utility or the consumers and if existing methodology for tariff determination is continued, Generic Tariff could reach up to Rs 7.5/kWh, leading to huge financial stress. Therefore, MSEDCL submits that change in wind turbine technology and efficiency needs to be reflected in the capital cost.

Commission's Ruling:

The premise for computation of capital cost norm for wind power projects have been elaborated under Clause 3.3 of this Order and the same is in line with the provisions outlined under MERC RE Tariff Regulations, 2010.

Further, the Commission observes that the MERC RE Tariff Regulations, 2010 have been notified after undertaking the required regulatory process of prior publication, invitation of comments, etc., and the norms specified in the Regulations cannot be modified through this present regulatory proceedings initiated for generic RE tariff determination.

1.19 Operation and Maintenance Expenses for Wind Power Projects:

Stakeholders Comments/Suggestions:

Torrent Power requested the Commission to consider the one time increase of at least 20% of O&M base price in the 11th year over the O&M fees of 10th year which will then be considered as base price for determining the O&M fees during the balance life based on escalation factor of 5.72% per annum as consider by Commission and also allow an increase in the base O&M fees of first year to include service tax rate of 12.36%.

ReGen Powertech Pvt. Ltd, Inox Renewable Energy Limited, Kenersys India Private Limited, Reliance Power limited and Surajbari Windfarm Development Pvt Ltd. requested the Commission to consider O&M in between Rs 9.50 lakh/MW to Rs 12 Lakh/MW while GE India Ltd requested to consider CERC guidelines for O&M expense.

MSEDCL submitted that the Commission has provided O&M norms (Rs. 8.12 Lakhs / MW) on the higher side considering the fact that maintenance of the wind farm is carried out through third party maintenance contracts which should result in reduced employee, administrative and general expenses and overall O&M cost. Taking into account the O&M norms provided by other state Regulators, MSEDCL requested the Commission to

provide lower O&M norms.

Commission's Ruling:

The normative O&M expenses for wind energy projects for FY 2013-14 has been determined in accordance with Regulations 27.1 and 27.2 of the MERC RE Tariff Regulations, which have been notified after undertaking the required regulatory process of prior publication, invitation of comments and the norms specified in the Regulations cannot be modified through current regulatory process.

1.20 Capacity Utilisation Factor, WPD and Minimum Performance Value

Stakeholders Comments/Suggestions:

InWEA requested the Commission to consider the same capacity utilization factor for determination of Tariff till present control period (i.e. 31 March, 2015 as specified in MERC Tariff Regulations, 2010 at a hub-height of 50 meters not at 80 meters)

GE submitted that it strongly supports MERC's revised Wind Power Density (WPD) characterization and CUF norms aligned with WPD and hub height criteria for measurement of WPD. It also recommended a Minimum Performance Value (MPV) on equipment installed to optimize use of the resources. It is submitted that Renewable Energy Policy guidelines could lay down Minimum Performance Value (MPV) based on CUF for wind energy based on certain site/zone conditions.

Kenersys India Private Ltd requested a minor correction in wind zone definition. i.e. Zone 1 \leq 250, 20% CUF instead of Zone 1 = 200 to 250, 20% CUF and also mentioned that with reference to MEDA's procedure for classification of Wind Power Projects into wind zone, the Commission is requested to delete clause (d) (i.e. effective WPD of the site would be with reference to the respective mast of C-WET or private mast irrespective of altitude or terrain, within circle of influence of 10 kms).

Commission's Ruling:

As regards the submission of Kenersys India, Regulation 26.1 of the MERC RE Tariff Regulations, 2010 specify the classification of wind zones based on Annual Mean Wind Power Density. However, to remove the ambiguity regarding the same, considering the

MNRE circular dated 8 August, 2011, which suggests that there should not be any restriction for minimum WPD of 200 W/m² for development of wind power projects and in pursuance of the powers of the Commission under “Removal of Difficulty” as specified in Regulation 77.1 of RE Tariff Regulations, 2010, the Commission hereby modifies the representation of wind zones as under:

Wind Zone	Original Wind Zone Classification Annual Mean Wind Power Density (W/m²) as per MERC RE Tariff Regulations, 2010	Revised Wind Zone Classification Annual Mean Wind Power Density (W/m²) in line with MNRE circular dated 1 August, 2011	CUF (%)
Zone 1	200-250	<=250	20%
Zone 2	250-300	>250 - <=300	23%
Zone 3	300-400	>300 - <=400	27%
Zone 4	>400	>400	30%

In accordance with Regulation 26.2 of the MERC RE Tariff Regulations, the annual mean wind power density is to be measured at 50 metre hub-height. Accordingly, the Commission has determined the wind energy Tariff as per the annual wind power density criteria at 50m hub height.

As regards to the request of Kenersys India request to delete clause (d) (i.e. effective WPD of the site would be with reference to the respective mast of C-WET or private mast irrespective of altitude or terrain, within circle of influence of 10 kms) and GE’s recommendation of Minimum Performance value, Commission directs MEDA to review the need for modification in procedure as sought by objector upon extensive consultation and submit its recommendations. The Commission grants liberty to objectors to file separate petition in the matter, if necessary.

1.21 Auxiliary Consumption and De-rating of wind machine

Stakeholders Comments/Suggestions:

Bajaj Finserv Ltd vide letter dated 01 February 2013 requested the Commission to consider 5-6% auxiliary consumption while determining the Tariff for wind energy. It also

requested the Commission to clarify for eligible RE for Renewable Energy Certificate (REC) that energy drawl (Export) from grid for “start up of WEG” is neither auxiliary consumption nor self use from WEG, hence as per current practices it is chargeable as per prevailing applicable tariff and need not to be deducted from injected [Import w.r.t grid] energy for commercial/ REC purpose.

ReGen Powertech Pvt. Ltd. requested the Commission to consider 1% auxiliary consumption and also requested the Commission to consider de-rating of wind machine at a rate of 1% every year after 5 years.

Commission’s Ruling:

The Commission observes that the review of the performance norms for auxiliary consumption and treatment for import of power from the grid by RE projects cannot be addressed as a part of the current regulatory process, which has been initiated for determination of RE Tariff for FY 2013-14 in pursuance of RE Tariff Regulations, 2010.

1.22 Banking Mechanism

Stakeholders Comments/Suggestions:

ReGen Powertech Pvt. Ltd. submitted that for promotion for wind power plants banking mechanism may be provided. Banking period may be considered from June to May and banking charges may be considered as 2%. Tariff for unutilized energy at the end of the banked period may be fixed as 85% of normal Tariff of that category.

Commission’s Ruling:

The Commission observes that the issued related to banking which pertains to captive/third party wheeling transactions cannot be addressed as a part of the current regulatory process, which has been initiated for determination of generic RE Tariff for FY 2013-14 in pursuance of RE Tariff Regulations.

1.23 Additional Depreciation and Accelerated Tax Benefit

Stakeholders Comments/Suggestions:

Reliance Power requested Commission to clarify the term “if availed” used in the order. There has been industry wide confusion over the usage of the term “Benefit of Additional Depreciation (If availed)”. The Commission is request to provide clarity on the same by showing some scenarios under which this would be applicable.

Tata Power Company Ltd mentioned that accelerated tax benefit arises out of the high depreciation of the order of 80% to 100% given to some of the equipments under the Income Tax Act 1961. Otherwise all projects are entitled for rate of depreciation of about 15% under Income Tax Act but such projects cannot be claimed as one claiming accelerated tax depreciation. As correctly pointed out in the draft order, the benefit of accelerated depreciation is not available to wind projects and the applicable depreciation rate is 15%. Hence there should be only one levellised Tariff for each zone and there should no further reduction in levellised tariff on the account of Accelerated Tax Depreciation as shown in last two columns in the table on page 16. There should be no reduction on the account of “additional depreciation” since the RE Tariff regulations envisage only accelerated tax depreciation. In any case, the additional depreciation is available only for first year of operation.

Tata Power Company Ltd further submitted that even considering that above is the income tax depreciation benefit, Commission is requested to clarify the situations when such benefits can be considered as availed by Project Company. If one sees the computations closely, the benefit signifies that higher depreciation (Tax depreciation against book depreciation) arising out the project is set off against the profits of the other business of the project company. TPC submitted that the set off can be availed only if 1) there is adequate taxable profit made by other business to set off and 2) the company is paying tax under Normal Rate and not under MAT. In case, any of the above condition does not hold true, the benefit of the income tax depreciation cannot be availed. For example if the company is paying tax under MAT, the benefit of income tax depreciation is not available and the project cannot claim income tax depreciation benefit as the tax is determined through the book profit. Similarly, a company may be under MAT in the first year followed by normal tax from the following year onwards. In such a situation, it needs to be clarified whether the project company has availed the accelerated tax benefits. There can be several such

cases that can be built up to determine whether the project company is in position to avail of such tax benefits.

TPC submitted that in order to be categorized as a company which has availed of the tax depreciation benefit, one should look at only the first two years of operation when the majority of the tax benefits flow to the project company. In case the project company is in normal tax for both the years and has adequate taxable profits to set off the depreciation from the project, it can be considered as one that has availed of income tax benefit else not. TPC requested the Commission to insert a word of clarification on this subject in its final order to avoid any dispute at a later date.

Commission's Ruling:

The Commission opines that the whether the company has claimed accelerated/additional depreciation benefits in their annual income tax return filings will have to be ascertained as per tax auditor's certificate for the relevant financial year. Accordingly, the tariff for the said financial year shall be applicable as covered under the generic Tariff Order for relevant RE technology, irrespective of the actual tax suffered by the company.

As stipulated in Regulation 22.1 of MERC RE Tariff Regulations, 2010, the Commission observes that it shall take into consideration the incentive or subsidy offered by the Central or State Government while determining tariff. Therefore in case of wind energy projects, differentiation in tariff is proposed for projects claiming additional depreciation in the first year, vis a vis projects not claiming additional depreciation.

1.24 Realistic Wind Energy Potential and Single Tariff across the State

Stakeholders Comments/Suggestions:

MSEDCL submitted that installed capacity of wind power in the State has reached around 50% of the total assessed potential. Thus, MEDA should reassess the wind potential and RPO targets needs to be consistent with the actual scientific assessment and accordingly, tariffs need to be decided.

MSEDCL submitted that MNRE has withdrawn the qualifying criteria of minimum wind power density (WPD) of 200 W/m² at 50 m above ground level for establishment of wind power project. Therefore there is a need for change in procedure for classification of Wind

Power Projects in Wind Zone Class by MEDA.

MSEDCL further requested the Commission to reconsider the zone wise tariff for wind projects in the State and determine a single tariff for all zones. With the development in technology, certain class of WTGs are offering CUF as high as 30%. MSEDCL suggested that zone-wise classification approach should be discontinued and single PLF should be determined for entire state. This approach will allow developers to identify potential sites which provide better CUF than normative instead of searching high potential wind sites in zone classified as Zone I or Zone II.

Commission's Ruling:

The Commission observes that renewable potential assessment or re-assessment for various RE technologies to take into consideration advancement in technologies and review of RPO targets thereof is an important and continuous exercise. However, the same is not the subject matter of present proceedings which have been initiated to determine generic RE tariff for fourth year of the control period pursuant to MERC RE Tariff Regulations, 2010.

As regards wind zone classification procedure, Commission in its Suo-Motu Order dated 14 July, 2010 has given direction to MEDA to devise suitable procedures for classification of wind projects into wind zone class, in consultation with C-WET, wind energy developers and Distribution Licensees. MEDA in consultation with C-WET, Wind Energy Developers and Distribution Licensees has finalised the said procedure and the same was uploaded on the website of MEDA.

The value of annual mean Wind Power Density (WPD) of the windy sites declared by C-WET, under MNRE or MEDA programme or the value of the annual mean WPD of the private windy site data vetted by C-WET, forms the basis for the classification of wind power projects into wind zone classes. Thus wind zoning has been finalised after extensive consultation exercise followed by MEDA and with technical support from C-WET. The Commission is of the view that the need for revision or modification in procedure could arise as and when the performance norms or classification for WPD measurement under regulations, if and when amended, if necessary, upon following due regulatory process. .

Further, the issue raised by the objector is not subject matter of this regulatory process, the scope of which is limited to determination of Generic Tariff for the fourth year of the first Control Period under Regulation 8 of the MERC RE Tariff Regulations, 2010.

1.25 Impact on Power Purchase Cost, Competitive Bidding, Augmentation of Capacity and Grid Stability

Stakeholders Comments/Suggestions:

MSEDCL submitted that it is a well known fact that wind speed is generally high during the monsoon and gradually it slows after monsoon. Such infirm power affects the grid stability due to its very inconsistent nature and availability during non peak hours. Wind power is unscheduled power which also has implication on intra-state ABT mechanism. It becomes financially unviable for MSEDCL to avail such costly power at the time when MSEDCL is in a precarious financial situation.

MSEDCL also suggested that as wind power generation is approaching maturity, preferential tariff should be phased out and competitive bidding may be introduced.

MSEDCL also submitted that many developers are considering the augmentation of existing capacity and requested the Commission to specify certain issues related to augmentation in the order. MSEDCL may also file a separate petition to determine tariff for such cases.

Commission's Ruling:

The Commission observe that the issue of variable /intermittent generation of RE sources such as wind/Solar as raised by the objector will have to be dealt with in accordance with provisions of IEGC. Further, the Commission observes that addressing several operational issues of grid connectivity and grid operations with integrated operations of variable RE generation would require capacity building at SLDC, modification of existing operating process/procedures in line with IEGC, 2010, introduction of Renewable Regulatory Fund (RRF) mechanism, visibility of such RE generation to SLDC using SCADA/IT backbone etc. While Commission recognises that these are important issues, but the same is outside scope of the present proceedings.

Regarding competitive procurement of wind power, the Commission shall be guided by the provisions of Section 63 of the Electricity Act 2003 which stipulates that the Commission shall adopt the tariff if procurement of power is undertaken through a transparent process of competitive bidding, provided Guidelines for such competitive procurement are notified by the Central Government. The relevant section is reproduced below:

“Notwithstanding anything contained in Section 62, the Appropriate Commission shall adopt the tariff if such tariff has been determined through transparent process of bidding in accordance with the guidelines issued by the Central Government.”

However, till date, no such guidelines for competitive procurement of RE power have yet been notified by the Central Government. As and when Central Government notifies the competitive bidding guidelines & standard bidding documents for procurement of power from RE sources, the same could be considered.

As regards issues associated with augmentation of capacity by developers, the same may be dealt with on a case to case basis.

However, the issues raised by the objector are not subject matter of this regulatory process, the scope of which is limited to determination of Generic Tariff for the fourth year of the first Control Period under Regulation 8 of the MERC RE Tariff Regulations, 2010.

1.26 Tariff Structure, PPA and Useful life of wind Power Plants

Stakeholders Comments/Suggestions:

Torrent Power vide letter dated 5 February 2013 submitted that the useful life of wind energy project should be considered as 20 years instead of 25 years due to techno-commercial feasibility of such projects and also requested the Commission to consider carrying out levelisation of cost over the Tariff period of 13 years and then provide a separate levelled Tariff for balance 7 years or allow the Tariff for useful life of the project.

Kenersys India Private Ltd submitted that Tariff period for wind power should be 25 years (useful life of turbine), as is considered by most of other SERC’.

MSEDCL suggested that the Energy Purchase Agreement period may be extended to life of the project. Currently, even though life of WTGs is 20 Yrs, (now 25 yrs) EPA for purchase of energy has been determined for 8 (now 13) years. With assured rate of return of 19% to 24% on equity entire investment of the wind generators gets recovered with substantial profit. After EPA expiry, WEGs should sell power to the utility at discounted tariff (7 yrs (now 12 yrs) of payback period.

GE submitted that the Tariff levels to support low and medium wind speed turbines would be Rs. 4.65-7.20 per kWh for WPD range of 400-200 W/sq. m, assuming no accelerated depreciation and no GBI is available.

Vidyut Urja Equipments Pvt. Ltd submitted that in order to make the investment feasible the Tariff structure should be increase by at least by 2 % every year for the entire period of PPA.

Commission's Ruling:

Regulation 6 of the MERC 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 wind project. The Commission also observes that while tariff period is specified as 13 years, the levellisation is carried out over useful life which is 25 years and not just over 13 years, thereby ensuring the cost recovery is spread over entire useful life which also results in back-ending of the returns. Further, the Commission notes that the review of tariff period or revision in useful life are not the subject matters of the current regulatory process, which has been initiated for determination of Tariff based on provisions outlined under the notified RE Tariff Regulations.

As regards the stakeholders request of annual escalation in Tariff, the Commission observes that the annual escalation in O&M costs are factored in the computation of cost of generation and determination of levellised tariff. Further, the tariff structure for the purpose of generic RE tariff determination has been determined in line with provisions stipulated under RE Tariff Regulations and accordingly the tariff for wind projects have been determined which has been further elaborated under in Para 3.11 of this order in line with MERC RE Tariff Regulations 2010. The Commission further observes that the

review of Tariff structure under MERC RE Tariff Regulations is not the subject matter of present proceedings and that the said RE Tariff Regulations have been notified after undertaking the required regulatory process of prior publication, invitation of comments, etc., and other norms specified in the Regulations cannot be modified through this Suo-motu Order.

Non-Fossil fuel based Co-generation projects

1.27 Capital cost of Non-Fossil fuel based Co-generation projects

Stakeholders Comments/Suggestions:

Orient Green Power Company Ltd, Maharashtra Rajya Sahakari Sakhar Karkhana Sangh Ltd, Yash Agro Energy Ltd and Co Gen Association of India requested the Commission to consider capital cost of Rs. 5.25 cr / MW to Rs. 6.50 cr /MW for Tariff determination.

Maha Co-Gen Green Power Producers Association vide letter dated 7 February 2013 requested the Commission to consider the capital cost of Rs. 568 Lakh per MW as against Rs. 464.39 lakh as the data is duly certified by the Chartered Accountant and accepted by the banks.

MEDA submitted that severe drought situation in the Maharashtra may be considered while deriving the variable charge component and appropriate rise may be given.

Commission's Ruling:

The Commission observes that the capital cost for the non-fossil fuel based co-generation projects for FY 2013-14 has been determined in line with the provisions of the MERC RE Tariff Regulations, 2010 which has been further elaborated under Para 6.2 of this Order.

1.28 Operation and Maintenance Expense:

Stakeholders Comments/Suggestions:

Orient Green Power Company Ltd and Yash Agro Energy Ltd. requested the Commission to consider O&M expenses ranging from Rs. 40-50 lakhs /MW p.a. while the Co-Gen

Association of India requested the Commission to increase the O&M expenses to Rs. 25 lakh /MW as against Rs. 16.67 lakhs /MW considered by the Commission.

Maharashtra Rajya Sahakari Sakhar Karkhana Sangh Ltd and M/s IL&FS submitted that O&M expenses are considered as Rs. 16.67 lakh / MW whereas the average cost of O&M FY 2013-14 works out to Rs 22.35 lakh /MW considering 5.72% escalation as per norms of the Commission.

Commission's Ruling:

The Commission has noted the inadvertent error in application of inflation index in computation of O&M cost as pointed out by Maharashtra Rajya Sahakari Sakhar Karkhana Sangh and M/s IL&FS and accordingly modified the same. However, the Commission observes that revision in norm for the O&M costs is not the subject matter of these proceedings which has been initiated to determine generic RE Tariff in accordance with the provisions stipulated under RE Tariff Regulations, 2010.

1.29 Auxiliary Consumption and Station Heat Rate

Stakeholders Comments/Suggestions:

Orient Green Power Company Ltd vide letter dated 7 February 2013 requested the Commission to fix auxiliary consumption at 10% and the station heat rate at 4500 kcal/kWh.

Co Gen Association of India vide letter dated 08 February 2013 requested the Commission to increase the auxiliary power consumption to 10% against 8.5% considered by the Commission.

Maharashtra Rajya Sahakari Sakhar Karkhana Sangh Ltd. submitted that auxiliary power consumption of 8.5% has been considered as against 9.5 to 10% actual and also mentioned that PLF is considered as 60% whereas it should be 40% to 50% of the installed capacity. It further requested to consider Station Heat Rate as 3883 kCal /kWh as against 3600 kCal /kWh.

Yash Agro Energy Ltd. submitted that auxiliary power consumption for co-gen projects of less than 12 MW should be considered at 12% and Station Heat should be of 4000 to 4400 kCal per kWh.

MEDA submitted that due to operational fluctuations in the sugar factories the auxiliary power consumption may be increased to 11%. From the compliance monitoring report received by MEDA, it is observed that the overall value of SHR is in the range of 4000 kCal/ kWh to 7000 kCal / kWh. MEDA submitted that overall SHR should be revised to about 4500 kCal /kWh and requested that the basis of computation of SHR should be considered either on overall basis or heat balance basis.

Commission's Ruling:

The Commission observes that the current regulatory process has been initiated for determination of RE Tariff for FY 2013-14 in pursuance of MERC RE Tariff Regulations, 2010. The Commission is of the view that the above issues raised by the objectors entail an amendment in the said regulations and are not subject matter of this regulatory process.

1.30 Variable Cost of Non-Fossil fuel based Co-generation projects

Stakeholders Comments/Suggestions:

Orient Green Power Company Ltd vide letter dated 07 February 2013 requested the Commission to consider peculiar circumstances of the co-generation plants and enhances the average fuel cost to Rs 2500 per/MT.

Co Gen Association of India vide letter dated 08 February 2013 requested the Commission to increase the fuel cost accordingly and determine the tariff for these projects.

Maha Co-Gen Green Power Producers Association vide letter dated 07 February 2013 submitted that the plants are procuring fuel at the average rate of Rs.2500 per MT of bagasse. Over and above the landed price of Bagasee in factory, further costs involved in handling the Bagasee with respect to shifting the Bagasee from its storage place to return Bagasee carrier and feeding the Bagasee in return Bagasee carrier works out to be Rs. 0.25 per kWh which therefore even based on MERC calculation, adding Rs. 0.25 towards handling cost, the Variable cost works out to Rs. 3.71 per kWh as against Rs. 3.46 per

kWh i.e. net variable tariff should be Rs. 3.71 per kWh as against Rs. 3.46 per kWh. This year the cane availability as per the Sugar Commission's data is going to half of last year, thus making fuel availability scarce and more expensive. It was submitted that the fuel cost may be considered at least at Rs. 2500 per MT.

Maharashtra Rajya Sahakari Sakhar Karkhana Sangh submitted that in spite of significant increase in the cost of the fuel the rate is considered at Rs. 1980 / MT of bagasse by Commission as against Rs. 3000 / MT or more for FY 2013-14. Allowed use of fossil fuel up to 15% but coal linkages have not been given by Govt. hence Co-Gen plant have to procure coal with higher prices from market which has not been considered by Commission. Decrease in crushing period of sugar factories from 180 days to 150 days have not been considered by MERC.

Commission's Ruling:

The Commission observes that the fuel price for the co-generation projects has been determined in accordance with the provisions stipulated under RE Tariff Regulations, 2010 and further elaborated under the Para 6.13 of this Order. As regard to the issue of revision in variable cost computation for new co-generation projects due to revision in other operating and performance parameters is concerned, the review of the same cannot be addressed as a part of the current regulatory process, which has been initiated for determination of RE Tariff for FY 2013-14 in pursuance of RE Tariff Regulations.

However, the issue of variable cost for existing projects is addressed in Para 6.15 of this order.

1.31 Levellised Tariff of Non-Fossil fuel Co-generation projects

Stakeholders Comments/Suggestions:

Orient Green Power Company Ltd vide letter dated 07 February 2013 requested the Commission to determine the levellised Tariff considering capital as Rs 600 Lakhs/MW, Interest on loan as 15% to 17%, O&M expenses of Rs. 40-50 Lakhs /MW, auxiliary consumption of 10%, the station heat rate of 4500 kcal/kWh and average fuel cost of Rs 2500 per/MT

Maha Co-Gen Green Power Producers Association vide letter dated 07 February 2013 submitted that based only on MERC calculations a minimum tariff of at least Rs. 6.80 per kWh should be allowed.

Maharashtra Rajya Sahakari Sakhar Karkhana Sangh Ltd. requested the Commission to fix the minimum tariff of Rs. 6.80 per kWh for FY 2013-14 for non-fossil fuel co-gen unit which includes variable cost of Rs. 3.71 / kWh and fixed cost of Rs. 3.09 /kWh.

Yash Agro Energy Ltd. submitted that the Tariff for Co-Gen power projects commissioned prior to FY 2013-14 be recomputed based their suggestions / changes and should be at least equal to tariff suggested by CERC(for Maharashtra) vide their draft order dated 25 Oct 2012 i.e. Rs. 5.83 / kWh

Commission's Ruling:

The Commission observes that the Tariff for non-fossil fuel based co-generation projects for FY 2013-14 has been determined in accordance with the norms stipulated under RE Tariff Regulations and further elaborated under chapter 6 of this Order.

Biomass Power Projects:

1.32 Capital cost of Biomass based Power Projects:

Stakeholders Comments/Suggestions:

Kalyani Renewable Energy India Ltd vide letter dated 07 February 2013 submitted that capital expenditure for biomass power projects has increased significantly due to various reasons and Commission is requested to consider the capital expenditure norm of at least Rs. 6.5 Crore/MW.

GMT Mining & Power Pvt. Ltd submitted that actual capital cost of Biomass power project to be set up by GMT is expected to reach to Rs. 63 Cr. for 10 MW installed capacity. It requested the Commission to consider normative cost of Rs. 600 Lacs / MW.

Commission's Ruling:

The Commission observes that the capital cost norm for biomass power projects for FY 2013-14 has been determined in accordance with the provisions stipulated under the

MERC RE Tariff Regulations, 2010 and further elaborated under Para 5.2 of this Order. The issue raised by the objector for revising the capital cost norm is not subject matter of this regulatory process, the scope of which is limited to determination of Generic Tariff for the fourth year of the first Control Period under Regulation 8 of the MERC RE Tariff Regulations, 2010.

1.33 Working Capital of Biomass based power projects:

GAPS Power and Infrastructure Ltd vide letter dated 08 February 2013 requested to the Hon'ble commission to revise the interest in the working capital taking into account fuel stock of 6 months and also maintenance spares to the extent of 15.00% of O & M Expenses.

Commission's Ruling:

Consideration of the revision in parameters for computing normative working capital requirement as suggested by the objector would entail amendment of MERC RE Tariff Regulations, which is not subject matter of this regulatory process, the scope of which is limited to determination of Generic Tariff for the fourth year of the first Control Period under Regulation 8 of the MERC RE Tariff Regulations, 2010.

1.34 O&M Expenses of Biomass Power Projects

GAPS power and infrastructure Limited vide letter dated 08 February 2013 prayed to the Hon'ble Commission that the fixed charges should be revised considering the O& M expenses at Rs. 35 lakhs / MW with annual escalation of 7% due to significant increase in the inflation rates, increase in the price of spares, increase in the price of diesel (required for Tractors / Dozers), increase in minimum wages rates. Cost of Water charges also needs to be considered in the O&M charges.

Commission's Ruling:

Regulation 18 of the MERC RE Tariff Regulations, 2010 specifies the provision related to Operational and Maintenance cost which comprises of repair and maintenance (R&M), establishment including employee expenses, and administrative and general expenses

including insurance. The said Regulations have been finalised after previous publication and extensive consultation process. Moreover, the issue raised by the stakeholder is not a subject matter of this regulatory process, scope of which is limited to determination of Generic Tariff for the fourth year of the first Control Period under Regulation 8 of the MERC RE Tariff Regulations, 2010.

1.35 Technology, Station Heat Rate, Calorific Value and Auxiliary power consumption of Biomass power plant:

Stakeholders Comments/Suggestions:

Technology: GE submitted that it strongly recommends that technology options for biomass based power generation be open, the choice be made by the developer based on the economics and it further recommended that in addition to the direct combustion based on Rankine cycle technology, the Gassifier Gas Engine route for power generation may be promoted.

Station Heat Rate: GAPS Power and infrastructure Ltd vide letter dated 08 February 2013 requested the Commission to revise the Gross Station Heat Rate to 4500 kCal/kWh for both existing and new projects. It submitted that CEA in its report of September 2005 has also recommended the gross station heat rate as 4500 Kcal / kWh.

Maharashtra Biomass Energy Developers Association and GMT Mining & Power Pvt. Ltd requested the Commission to consider SHR as 4000 kCal / kg as per CERC Draft Suo motu Order Dated 25 October 2012.

MEDA submitted that from the compliance monitoring report received by MEDA it is observed that a variety of Biomass fuels are being used on overall annual basis. It is found that there is great amount of variation in the calorific values of various biomass fuels and this affects the overall SHR. Therefore MEDA feels that SHR for biomass power projects should be around 4500 kCal / kWh instead of 3800 kCal / kWh.

Calorific Value of Biomass: GAPS requested the Commission to revise the gross calorific value to 3300 Kcal/kg. Yash Agro Energy Ltd and GMT Mining & Power Pvt. Ltd

submitted that the average calorific value of biomass fuels may be considered as 3200 kCal / kg as applicable for Rice Husk.

Auxiliary power Consumption: GMT Mining & Power Pvt. Ltd mentioned that auxiliary power consumption for biomass power projects smaller than 12 MW should be considered at 12%.

Commission's Ruling:

The Commission is of the view that station heat rate, calorific value and auxiliary power consumption are performance parameters for which norms have been stipulated under the MERC RE Tariff regulations. Any modification in the same will amount to a review of the RE Tariff Regulations, which is not the subject matter of this Regulatory Process.

Variable Charges and Fixed Charges

Stakeholders Comments/Suggestions:

GAPS Power and Infrastructure Ltd vide letter dated 08 February 2013 requested the Commission to revise the variable charge to Rs. 4.84 per kWh considering the heat rate 4500 kCal/kWh, GCV of 3300 kCal / kg and fuel cost of Rs. 3200 per MT. GAPS also requested the Commission to revise the fixed charges to Rs. 2.20 per kWh considering the increase in O&M expenses, interest on working capital and MAT rate.

Indian Biomass Power Association requested the Commission that the price of biomass should be fixed as Rs.4000/MT. Kalyani Renewable Energy India Ltd submitted that actual landed price of biomass at the applicant's plant is Rs. 3500 to 3600 per MT and requested the Commission to consider actual price.

Maharashtra Biomass Energy Developers Association vide letter dated 07 February 2013 requested the Commission to consider the biomass price of Rs. 3300 /MT for FY 2013-14 and submitted that variable Cost with GCV of 3300 kCal / kg , SHR of 4000 kCal / kWh and current average fuel price of Rs. 3300 / MT would work out as Rs. 4.39 / kWh

The Tata Power Company Ltd submitted that there is no concept of levelled tariff for variable charge for biomass power project. It is submitted that the interest on working capital is a part of fixed charges and 4 months of biomass expenses have been considered as a part of working capital. TPC also submitted that in order to correctly compute the levelled fixed charges, the interest on working capital needs to be correctly estimated which in turn means that the variable charge for Biomass cannot be held as constant. The same needs to be suitably escalated. CERC has considered an escalation of 5% p.a. and requested the Commission to consider the same.

MEDA and MSEDCL submitted that as per the regulation 35.2 of the RE Tariff Regulation 2010, fuel related aspects specified under the Regulation shall be applicable for existing and new biomass power project. However, the variable charge considered in the draft order for projects commissioned during the FY 2013-14 and prior to FY 2013-14, differ. Since variable charge is related to fuel cost, it is felt that the variable charge component considered for existing projects i.e. Rs. 4.01 / kWh should also made applicable for new biomass power projects to be commissioned during the FY 2013-14. It is submitted that variable cost cannot differ based on the CoD of the plant, as fuel remains the same.

Commission's Ruling:

The Commission observes that the biomass fuel price and applicable variable cost for new biomass power projects during FY 2013-14 has been determined in accordance with the provisions stipulated under MERC RE Tariff Regulations, 2010 and further elaborated under Para 5.13 and Para 5.15 of this Order.

As regard to difference pointed out by objectors regarding in variable cost of existing and new projects, Commission is of the view that fuel price for existing and new projects is considered as same, However, as stipulated in MERC RE tariff Regulations, 2010 performance parameters for new projects are considered in line with the norms specified in MERC Tariff Regulation while performance parameters for old projects are considered as specified in relevant orders. Accordingly variable cost for existing projects has been worked out in Para 5.16 of this order.

1.36 Tariff of Biomass Power Plant

Stakeholders Comments/Suggestions:

GAPS Power and Infrastructure Ltd vide letter dated 08 February 2013 requested the Commission to revise the total Tariff to Rs. 7.04 per kWh considering the revision proposed in fixed and variable charges.

Kalyani Renewable Energy India Ltd vide letter dated 07 February 2013 submitted that tariff of minimum Rs. 6.50 per kWh be fixed for this sector. The 16 biomass plants in the state collectively have around Rs. 800 crore of investment which is presently proving to be a NPA due to unviable tariff. Out of 16 plants around 10 have already shut down.

Maharashtra Biomass Energy Developers Association vide letter dated 07 February 2013 submitted that present Tariff may be reviewed and may be fixed at Rs. 6.09 / kWh. variable cost with GCV of 3300 kCal / kg, SHR of 4000 kcal / kWh and current average fuel price of Rs. 3300 / MT would work out as Rs. 4.39 / kWh. Therefore, considering fixed cost of 1.70 per kWh as determined by the Commission and variable Cost as worked out, the total Tariff is $1.70 + 4.39 = 6.09$ per kWh.

GMT Mining & Power Pvt. Ltd requested that tariff for Co-Generation power projects for FY 2013-14 be recomputed based on their suggestions or should be in line with the tariff suggested by CERC (for Maharashtra) vide their draft order dated 25 Oct 2012 i.e. Rs. 6.18 / kWh. GE submitted that Tariff for Biomass are recommended in the range from Rs 5.38/kWh to Rs 6.72/kWh.

Dalmia Sugar submitted that air-cooled condensers will have implications on cost and the thermal efficiency of biomass power plants and requested the Commission to consider a higher tariff for such plants as air-cooled condensers are environmentally more sustainable.

Commission's Ruling:

The Commission observes that the tariff for biomass power plant has been determined in accordance with the provisions stipulated under MERC RE Tariff Regulations, 2010 and further elaborated under chapter 5 of this Order.

1.37 Compliance Monitoring and Monthly fuel statements of Biomass and Non Fossil Fuel Based Cogeneration Projects

Stakeholders Comments/Suggestions:

MEDA requested the Commission to give necessary directives to all co-generators and biomass developers to furnish their monthly fuel related information to MEDA on regular basis as per the provision of the RE Tariff regulations, 2010.

Commission's Ruling:

The Commission observes that as per Regulation 43 and Regulation 59 of MERC RE Tariff Regulations, 2010, the biomass and non-fossil fuel based Cogeneration developers are required to furnish monthly fuel usage and monthly fuel procurement statement duly certified by Chartered Accountants regularly on a month-to-month basis along with the monthly energy bill to the beneficiary as well as to MEDA. MEDA is responsible for compliance monitoring of the biomass and non-fossil fuel based Cogeneration projects and publish this data on its website as per Regulation 44 and 59 of MERC RE Tariff Regulations. **The Commission hereby directs the biomass and non-fossil fuel based Cogeneration developers to strictly comply with this requirement of monthly data submission for each calendar month by 15th day of subsequent calendar month and also to furnish month-wise data /Statements for all earlier monthly periods, within 30 days from issuance of this Order, if not done until now.**

2. Common Parameters applicable for determination of Generic Tariff

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

2.1. CONTROL PERIOD

Regulation 5.1 of the RE Tariff Regulations specifies that the Control Period for determination of tariff for RE projects shall be five years, starting from the date of notification of the RE Tariff Regulations. The first year of the Control Period was FY 2010-11, the second year of the Control Period was FY 2011-12, the third year of the Control Period is FY 2012-13, and the fourth year of the Control Period is FY 2013-14. The first Proviso to Regulation 5.1 of RE Tariff Regulations stipulates that the tariff determined for the RE projects commissioned during the Control Period shall continue to be applicable for the entire duration of the Tariff Period (as specified in Regulation 6 of the RE Tariff Regulations).

Further, in accordance with Regulation 5.2 of the RE Tariff Regulations, the generic tariff determined for Solar PV projects and Rooftop Solar PV and other small solar projects based on the Capital Cost and other norms applicable for FY 2012-13 vide Commission's Order (Case No. 10 of 2012) dated 30 March, 2012 shall also apply for such projects during FY 2013-14, provided that (i) the Power Purchase Agreements (PPA) in respect of the Solar PV projects as mentioned in this Paragraph are signed on or before 31 March, 2013; and (ii) the entire capacity covered by the Power Purchase Agreements is commissioned on or before 31 March, 2014 in respect of Solar PV projects.

Further, for those solar photovoltaic power projects and Rooftop Solar PV and other small solar projects whose PPAs are signed after 31 March, 2013, the tariff for such projects for their commissioning during FY 2013-14 would be based on the benchmark capital cost norm for Solar PV power projects for FY 2013-14 as specified under Paragraph 6.4 of this Order.

In accordance with Regulation 5.2 of the RE Tariff Regulations, the generic tariff determined for Solar thermal projects based on the Capital Cost and other norms for FY 2012-13 vide Commission's Order (Case No. 10 of 2012) dated 30 March, 2012 shall also

apply for such projects to be commissioned during FY 2013-14, provided that (i) the Power Purchase Agreements (PPA) in respect of Solar thermal projects as mentioned in this Paragraph are signed on or before 31 March, 2013; and (ii) the entire capacity covered by the Power Purchase Agreements is commissioned on or before 31 March, 2014 in respect of such Solar thermal projects.

Further, for that Solar thermal power projects whose PPAs are signed after 31 March, 2013, the tariff for such projects for their commissioning during FY 2013-14 would be based on the benchmark capital cost norm for Solar thermal power projects for FY 2013-14 as specified under Paragraph 7.4 of this Order.

2.2. TARIFF STRUCTURE

Regulation 9.1 of the RE Tariff Regulations specifies that the tariff for RE projects shall be a single-part tariff consisting of the following fixed cost components:

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

For RE technologies having fuel cost component, like biomass power projects and non-fossil fuel based cogeneration projects, single-part tariff with two components, i.e., fixed cost component and fuel cost component, has been determined under this Order.

The relevant cost components and basis for determination of Generic Tariff in respect of each RE technology have been elaborated under technology specific Sections in detail.

2.3. TARIFF DESIGN

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

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

...

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

10.3 *Levelling 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'."*

2.4. INTEREST ON LOAN

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

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

For the purpose of computation of tariff, the normative interest rate shall be considered as average of State Bank Advance Rate (SBAR) prevalent during the previous year plus 150 basis points.

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

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

expectation to enhance transparency in lending rate due to which BPLR system needs to be replaced with Base Rate system.

As per this new guideline, all categories of loans have to be priced only with reference to the Base Rate with effect from 1 July, 2010. The Base Rate is the minimum rate for all loans below which, banks are not permitted to lend any funds. All banks have been directed to determine their actual lending rates on loans and advances with reference to the Base Rate plus borrower-specific charges, which will include product-specific operating costs, credit risk premium and tenor premium. Accordingly, all banks in India including the State Bank of India (SBI), have replaced Benchmark Prime Lending Rate with the new regime of Base Rate with effect from 1 July, 2010. Further, in order to give banks some time to stabilize the system of Base Rate calculation, banks were permitted to change the benchmark and methodology any time during the initial six month period, i.e., latest by end-December 2010. Accordingly, the system of Base Rate based lending has been under operation for almost two years. The Base Rate as notified by State Bank of India for the period 1 April-2012 to 15 March, 2013 is summarised below:

Period	Base Rate (%)	Period (no of days)
1 April-2012 to 26 September-2012	10%	179
27 September-2012 to 3 February-2013	9.75%	130
4 February-2013 to 15 March- 2013	9.70%	40
Weighted Average Base Rate for FY 2012 – 13	9.87%	349

Furthermore, the RE Tariff Regulations, 2012 published by CERC for the second Control Period, has also linked the normative interest rate with Base Rate of State Bank of India. The CERC RE Regulations, 2012 specified normative interest rate equal to three hundred (300) basis points above the State Bank of India Base Rate prevalent during the first six months of the previous year.

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

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

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

Accordingly, the weighted average of State Bank of India Base Rate for 1 April, 2012 to 15 March, 2013 as shown in the above table, plus 300 basis points, works out to an interest rate of 12.87% p.a. (9.87% + 300 basis points), which has been considered as the normative interest rate on long-term loans for computation of levelised tariff for RE technologies in this Order.

2.5. INTEREST ON WORKING CAPITAL

Regulation 17.3 of the RE Tariff Regulations provides for computation of the rate of interest on working capital as under:

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

In view of the rationale elaborated in Paragraph 1.4 above, the Commission has decided to revise the computation of normative interest rate on working capital also, by moving from Prime Lending Rate system to Base Rate system in pursuance of the powers of the Commission under "Removal of Difficulty" as specified in Regulation 77.1 of the RE Tariff Regulations. Further, in order to factor in the concerns for lending for RE projects, the Commission has decided to consider a spread of 350 basis points above the average Base Rate of State Bank of India to arrive at the normative interest rate on working capital. Thus, Interest on Working Capital loan shall be computed at an interest rate equivalent to average Base Rate of State Bank of India during the previous year plus 350 basis points.

Accordingly, the weighted average State Bank of India Base Rate for FY 2012-13 as available from 1 April, 2012 to 15 March, 2013 as shown in the above table, plus 350 basis points, works out to an interest rate of 13.37 % (9.87% + 350 basis points), which has been considered as normative interest rate on Working Capital for computation of levelised tariff for RE technologies in this Order.

2.6. LEVELISED TARIFF

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

Discount Factor

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

Interest Rate considered for the loan component (i.e., 70%) of Capital Cost is 12.87% (as explained in Paragraph 1.4 above). For the equity component (i.e., 30%), rate of Return on Equity (ROE) for the first ten (10) years is 19%, and for the 11th year onwards till useful life of the RE project, the rate is 24%. Based on these rates, the weighted average ROE has been calculated, which is around 22.3% (ranging from 22% to 22.57% depending on the useful life of RE technologies). The discount factor for each technology derived by this method is detailed in the respective technology specific Sections of this Order.

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

Regulation 22 of the RE Tariff Regulations specifies:

“The Commission shall take into consideration any incentive or subsidy offered by the Central or State Government, including accelerated depreciation benefit if availed by the generating company, for the renewable energy power plants while determining the tariff under these Regulations.

Provided that the following principles shall be considered for ascertaining income tax benefit on account of accelerated depreciation, if availed, for the purpose of tariff determination:

- a) Assessment of benefit shall be based on normative capital cost, accelerated depreciation rate as per relevant provisions under Income Tax Act and corporate income tax rate.*

- b) *Capitalisation of RE projects during second half of the fiscal year.*
- c) *Per unit benefit shall be derived on levelled basis at discount factor equivalent to weighted average cost of capital.”*

Accordingly, for the projects availing the benefit of accelerated depreciation as per applicable Income Tax rate of 32.445% (30% IT rate + 5% surcharge + 3% Education cess) has been considered. The Commission observes that while rate for surcharge has been revised to 10% provided taxable income exceeds Rs 10 Crore, under recently announced Finance Bill for FY 2013-14, the same is yet to be notified as Finance Act. Besides, in case of generic RE tariff computations based on 1 MW, the case taxable income exceeding Rs 10 Crore does not arise. For the purpose of determining the net depreciation benefits, depreciation @ 5.28% as per Straight Line Method (Book depreciation as per Companies Act, 1956) has been compared with depreciation as per Income Tax Act, i.e., 80% under Written Down Value method except in case of wind power projects, wherein, as per Income Tax (Fourth Amendment Rules), 2012, depreciation is now restricted to 15% for wind mills installed after 31 March, 2012) vide Notification No. 15/2012 [F.No.149/21/2010-SO(TPL)] S.O.694(E), dated 30 March, 2012). Moreover, additional 20% depreciation in the initial year is proposed to be extended to new assets acquired by Power Generation Companies vide amendment in Section 32, sub-section (1) clause (ii a) of the Income Tax Act.

Depreciation for the first year has been calculated at the rate of 50% of 80% or 15% as the case may be, and 50% of the additional depreciation of 20%, assuming the project to be capitalized during the second half of the financial year as per second proviso of Regulation 22.1. The tax benefit has been worked out as per normal tax rate on the net depreciation benefit. The ‘per unit levelised accelerated depreciation benefit’ has been computed considering the weighted average cost of capital as discounting factor. The detailed computation of benefit of accelerated depreciation in respect of each RE technology has been covered under the technology specific Sections.

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

2.8. SHARING OF CDM BENEFITS

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

2.9. APPLICABILITY OF TARIFF ORDER

This Tariff Order shall be applicable for New RE Projects to be commissioned during FY 2013-14 (i.e. from 1 April, 2013 to 31 March, 2014).

In case of Biomass power projects and Non fossil fuel based power projects commissioned on or prior to 31 March, 2013, the variable charge component of the tariff for FY 2013-14 shall be determined as outlined under the relevant provisions of this Order, whereas, fixed charge component of the tariff of such projects shall continue to be governed by the relevant Orders issued by the Commission.

The applicable Tariff Rate, Tariff Structure and other terms and conditions for RE Projects commissioned on or before 31 March, 2013 will be in accordance with the relevant provisions outlined under the Generic RE Tariff Order for FY 2012-13 (Case No. 10 of 2012 dated 30 March , 2012) 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 2013-14 based on various renewable energy technologies.

3. WIND POWER PROJECTS

3.1. USEFUL LIFE

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

3.2. TARIFF PERIOD

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

3.3. 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 RE Tariff Regulations. The Commission, in its Order dated January 11, 2012 (Case No. 153 of 2011) in the matter of Petition filed by M/s Gamesa, has considered the submissions made by MNRE that the provision for consideration of WPD of 200 W/m² at 50 m hub height does not hold relevance any longer. With change in wind turbine technology and better efficiency, even the lower wind regimes have become exploitable. Considering the same, the MNRE, vide its Circular dated 01.08.2011, issued a new guideline wherein it has been decided that hereafter, no restriction will exist for Wind Power Density criteria as far the development of wind power project is concerned. Subsequently, CERC in RE Regulations, 2012 specified the revised eligibility criteria for the wind energy projects in line with the latest guidelines issued by MNRE. Considering the MNRE, Circular dated 8 August, 2011, which suggests that there should not be restriction for minimum WPD of 200 W/m² for development of wind power projects and in pursuance of the powers of the Commission under “Removal of Difficulty” as specified in Regulation 77.1 of RE Tariff Regulations, 2010, Commission vide this Order proposes to revise the zone-wise classification as given below:

Wind Zone	Annual Mean Wind Power Density (W/m ²) as per MERC RE Tariff Regulations, 2010	Revised Annual Mean Wind Power Density (W/m ²) in line with MNRE Circular dated 1 August, 2011	CUF
Zone 1	200-250	<=250	20%
Zone 2	250-300	>250 - <=300	23%
Zone 3	300-400	>300 - <=400	27%
Zone 4	>400	>400	30%

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

While arriving at the index for capital cost norm for FY 2013-14 for the wind projects in Maharashtra, the Commission has considered the indices related information for the period of 12 months during calendar year 2012 starting from January 2012 to December 2012. Besides, in accordance with the RE Tariff Regulations, the calendar year 2009 has been considered as the base year. Accordingly, the indexed capital cost for wind energy projects to be commissioned during FY 2013-14 works out to Rs 540.66 Lakh per MW as summarised under the following table:

Capital Cost Indexation for Wind Power Projects (FY2013-14)

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	
	2012	2009	2012	2009
January	130.90	124.60	146.60	118.00
February	130.90	124.50	146.40	118.00
March	130.90	123.90	149.20	117.20
April	130.70	123.60	150.90	124.00
May	131.20	123.80	149.90	124.30
June	132.20	123.70	150.10	122.20
July	133.00	123.70	150.60	123.10
August	133.20	123.70	151.30	125.30
September	133.10	120.30	153.20	131.40
October	133.10	120.70	154.90	130.80
November	133.60	120.50	155.40	131.70
December	133.60	120.40	155.40	131.60
Average	132.02	122.78	151.16	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	15.74%
$P\&M_{(n)}$ (RsL/MW)	Plant & Machinery Cost for the nth Year (FY 2013-14)	432.53
$CC_{(n)}$ (RsL/MW)	Capital Cost for the nth Year (FY2013-14)	540.66

3.4. DEBT-EQUITY RATIO

Regulation 13.1 of the RE Tariff Regulations provides that the debt-equity ratio of 70:30 is to be considered for determination of generic tariff. In accordance with the normative debt equity ratio and the above stipulated Capital Cost, the debt and equity component for wind energy projects works out to Rs. 378.46 Lakh per MW and Rs. 162.20 Lakh per MW, respectively, for FY 2013-14.

3.5. 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 2013-14 works out as under:

Opening Equity (Rs lakh / MW)	162.20
Return on Equity for the first 10 years @19% (Rs lakh per MW)	30.82
Return on Equity after first 10 years @24% (Rs lakh per MW)	38.93

3.6. INTEREST ON LOAN

As explained above in Paragraph 2.4 of this Order, the interest rate of 12.87% (9.87% SBI Base Rate + 300 basis points) has been considered for Wind Energy Projects for loan amount of Rs. 378.46 Lakh per MW in FY 2013-14.

3.7. DEPRECIATION

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

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

3.8. INTEREST ON WORKING CAPITAL

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

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

(b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;

(c) Maintenance Spares @ 15% of operation and maintenance expenses."

Further, as explained above in Paragraph 2.5 of this Order, Interest on Working Capital shall be computed at an interest rate equivalent to average Base Rate of State Bank of India during the previous year plus 350 basis points. Paragraph 1.4 of this Order shows that average Base Rate of State Bank of India for FY 2012-13 is 9.87%. Accordingly, the rate of Interest on Working Capital for wind energy projects in FY 2013-14 works out to 13.37% (9.87% + 350 basis points).

3.9. OPERATION AND MAINTENANCE (O&M) EXPENSES

Regulation 27 of the RE Tariff Regulations specifies the normative O&M expenses for wind energy projects for FY 2010-11 as Rs 6.87 Lakh per MW, which is to be escalated at the rate of 5.72% per annum over the Tariff Period for determination of the levelised tariff. Accordingly, the Commission has considered O&M expense norm for wind energy projects as Rs 8.12 Lakh per MW for FY 2013-14.

3.10. CAPACITY UTILISATION FACTOR

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

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

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

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

Accordingly, in view of the finalisation of the procedure for classification of wind power projects into wind zones class by MEDA, the same shall form the basis for determination of applicable Tariff for wind power projects falling under particular wind zone class and the same shall be applicable for the Wind power projects to be commissioned in FY 2013-14.

3.11. LEVELLISED TARIFF FOR NEW WIND ENERGY PROJECTS IN FY 2013-14

Accordingly, the generic tariffs for Wind Energy Projects for FY 2013-14 have been determined as under. The discount factor for carrying out levelisation of Tariff for wind energy projects works out to 15.61%.

Tariff for New RE Projects for FY 2013-14- Wind

Wind Energy	Tariff Period	Levelised Tariff for	Benefits of Tax and Additional Depreciation	Net Levelised Tariff upon adjusting for Tax and Additional Depreciation Benefit)
		FY 2013-14	(if availed)	(if availed)
		Rs/kWh	Rs/kWh	Rs/kWh
Wind Zone-1	13	5.81	0.35	5.46
Wind Zone-2	13	5.05	0.31	4.74
Wind Zone-3	13	4.31	0.26	4.05
Wind Zone-4	13	3.88	0.23	3.65

Notes:

- The above Tariff shall be valid for Projects Commissioned in FY 2013-14.
- The above Tariff shall be valid for a Tariff Period of 13 years from the Commercial Operation Date (COD).

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

4.1. USEFUL LIFE

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

4.2. TARIFF PERIOD

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

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

4.3. CAPITAL COST OF SMALL HYDRO PROJECTS

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

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

While arriving at the index for capital cost norm for FY 2013-14 for the SHP projects in Maharashtra, the Commission has considered the indices related information for the period of 12 months during calendar year 2012 starting from January 2012 to December 2012. Besides, in accordance with the RE Tariff Regulations, the calendar year 2012 has been considered as the base year. Accordingly, the indexed capital cost for small hydro power projects to be commissioned during FY 2013-14 works out to Rs 577.54 Lakh/MW for small hydro projects with installed capacity (> 1 MW and upto and including 5 MW) and Rs 525.46 Lakh/MW for small hydro projects with installed capacity (> 5 MW to 25 MW) as summarised under the following table:

Capital Cost Indexation for Small Hydro Power Projects (FY2013-14)

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	0.16
F ₂	Factor for Erection and Commissioning	0.10
F ₃	Factor for IDC and Financing	0.14

Month/Year	Electrical & Machinery		Iron & Steel	
	2012	2009	2012	2009
January	130.90	124.60	146.60	118.00
February	130.90	124.50	146.40	118.00
March	130.90	123.90	149.20	117.20
April	130.70	123.60	150.90	124.00
May	131.20	123.80	149.90	124.30
June	132.20	123.70	150.10	122.20
July	133.00	123.70	150.60	123.10
August	133.20	123.70	151.30	125.30
September	133.10	120.30	153.20	131.40
October	133.10	120.70	154.90	130.80
November	133.60	120.50	155.40	131.70
December	133.60	120.40	155.40	131.60
Average	132.02	122.78	151.16	124.80

Parameter	Description	<5 MW	5-25 MW
CC ₍₀₎ (Rs L/MW)	Capital Cost for the Base Year	499.00	454.00
P&M ₍₀₎ (Rs L/MW)	Plant & Machinery Cost for the Base Year	356.43	324.29
dn	Capital Cost Escalation Factor	15.74%	15.74%
P&M _(n) (Rs L/MW)	Plant & Machinery Cost for the nth Year (FY 2013-14)	412.53	375.33
CC _(n) (Rs L/MW)	Capital Cost for the nth Year (FY2013-14)	577.54	525.46

4.4. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the RE Tariff Regulations, the debt and equity component for FY 2013-14 for SHP having capacities above 1 MW and up to and including 5 MW works out to Rs. 404.28 Lakh per MW and Rs. 173.26 Lakh per MW, 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. 367.82 Lakh per MW and Rs. 157.64 Lakh per MW, respectively.

4.5. RETURN ON EQUITY

In accordance with Regulation 16.2 of the RE Tariff Regulations, the RoE works out as shown in the Table below:

Particulars	> 1 MW and upto and including 5 MW	> 5 MW to 25 MW
Opening Equity (in Rs lakh per MW)	173.26	157.64
Return on Equity for the first 10 years @19% (Rs lakh per MW)	32.92	29.95
Return on Equity after first 10 years @24% (Rs lakh per MW)	41.58	37.83

4.6. INTEREST ON LOAN

As explained in Paragraph 2.4 of this Order, the interest rate of 12.87% (9.87% +300 basis points) has been considered for small hydro projects having capacities above 1MW and up to and including 5MW with a gross opening loan amount of Rs. 404.28 Lakh per 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. 367.82 Lakh per MW in FY 2013-14.

4.7. DEPRECIATION

In accordance with Regulation 15.2 of the RE Tariff Regulations, the depreciation will be charged at 7% for the first 10 years, and at 0.80% thereafter for the remaining useful period of 25 years for SHPs.

4.8. INTEREST ON WORKING CAPITAL

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

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

(b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;

(c) Maintenance spares @ 15% of operation and maintenance expenses"

Further, as explained above in Paragraph 2.5 of this Order, Interest on Working Capital shall be computed at an interest rate equivalent to average Base Rate of State Bank of India during the previous year plus 350 basis points, i.e., 13.37% (9.87% + 350 basis points).

4.9. OPERATION AND MAINTENANCE (O&M) EXPENSES

Regulation 32.1 of the RE Tariff Regulations provides, the normative O&M expenses for small hydro projects for FY 2010-11, to be escalated at the rate of 5.72% per annum over the Tariff Period for determination of the levelised tariff. Accordingly, the table below presents the normative O&M expenses considered by the Commission for small hydro power for FY 2013-14:

Project Size	O&M expenses (Rs Lakh/MW)
> 1 MW and up to and including 5 MW	21.24
MW to 25 MW	15.00

4.10. CAPACITY UTILISATION FACTOR (CUF)

In accordance with Regulation 30.1 of the RE Tariff Regulations, a CUF of 30% has been considered for determination of Tariff for SHPs.

4.11. AUXILIARY POWER CONSUMPTION

In accordance with Regulation 31 of the RE Tariff Regulations, the Normative Auxiliary Consumption of 1.0% has been considered for determination of tariff of SHPs.

4.12. INCENTIVE FOR MINI/MICRO HYDRO PROJECTS

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

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

In pursuance of Regulation 33.1 of the RE Tariff Regulations and in order to encourage deployment of Mini/Micro Hydro power projects, while determining the generic tariff for the second year of the Control Period in the Tariff Order dated 29 April, 2011 in Case No 39 of 2011, the Commission has further categorised small hydel projects below 1 MW into two sub categories, viz., a) above 500 kW and up to and including 1 MW at single location, and b) 500 kW & below at single location. Further, in view of the lack of economies of scale associated with such small hydel projects, the Commission has provided preferential tariff incentive for Mini/Micro hydel projects below 500 kW. Accordingly, in line with the principle outlined under earlier Order, the Commission hereby determines the tariff for such sub-categories of Mini/Micro Hydro Projects for FY 2013-14 as under:

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

4.13. LEVELLISED TARIFF FOR NEW SMALL HYDRO PROJECTS IN FY 2013-14

In light of the above parameters and the discount factor worked out as 15.61% for levelisation of tariff for SHPs, the generic tariffs for Small Hydro Projects for FY 2013-14 have been determined as under:

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

Small Hydro Power	Tariff Period	Levelised Tariff (FY 2013-14)	Benefit of Accelerated Depreciation (if availed)	Net Levelised Tariff (upon adjusting for accelerated depreciation benefit) (if availed)
		(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Mini and Micro Hydro				
500 and below	35	5.91	0.59	5.32
Above 500 kW and upto and including 1 MW	35	5.41	0.59	4.82
Other SHP				
Above 1 MW and upto and including 5 MW	35	4.92	0.58	4.34
Above 5 MW to 25 MW	13	4.21	0.53	3.68

Notes:

- The above Tariff shall be valid for Projects commissioned in FY 2013-14.
- 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

5. BIOMASS POWER PROJECTS

5.1. KEY PROVISIONS OF RE TARIFF REGULATIONS

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

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

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

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

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

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

The indexed Biomass Fuel Price (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"

Accordingly, in case of Biomass power projects commissioned on or prior to 31 March, 2013, the variable charge component of the tariff for FY 2013-14 shall be determined as outlined under Para 5.17 of this Order, whereas, fixed charge component of the tariff of

such projects shall continue to be governed by the relevant Orders issued by the Commission.

5.2. CAPITAL COST OF BIOMASS BASED POWER PROJECTS FOR FY 2013-14

The Commission under Regulation 36.1 has specified the normative capital cost for the biomass power projects based on Rankine cycle technology as Rs 402.54 Lakh per MW for FY 2010-11, which shall be linked to the indexation mechanism as specified under Regulation 36.1 of the RE Tariff Regulations. In accordance with the above referred Regulation, the normative capital cost of biomass power projects based on Rankine cycle technology shall be Rs. 471.31 Lakh per MW for FY 2013-14.

Capital Cost Indexation for Biomass Power Projects (FY2013-14)

Indexation Formulation

$$CC(n)=P\&M(n)*[1+F1+F2+F3]$$

$$dn = (a*(SIn-1/SI0)-1)+b*(EIn-1/EI0)-1)/(a+b)$$

$$P\&M(n)=P\&M(0)*(1+dn)$$

Variable	Description	Value
a	Weightage for Steel Index	0.7
b	Weightage for Electrical Machinery Index	0.3
F ₁	Factor for Land and Civil Work	0.10
F ₂	Factor for Erection and Commissioning	0.09
F ₃	Factor for IDC and Financing	0.14

Month/Year	Electrical & Machinery		Iron & Steel	
	2012	2009	2012	2009
January	130.90	124.60	146.60	118.00
February	130.90	124.50	146.40	118.00
March	130.90	123.90	149.20	117.20
April	130.70	123.60	150.90	124.00
May	131.20	123.80	149.90	124.30
June	132.20	123.70	150.10	122.20
July	133.00	123.70	150.60	123.10
August	133.20	123.70	151.30	125.30
September	133.10	120.30	153.20	131.40
October	133.10	120.70	154.90	130.80
November	133.60	120.50	155.40	131.70
December	133.60	120.40	155.40	131.60
Average	132.02	122.78	151.16	124.80

Parameter	Description	Cost
CC ₍₀₎ (RsL/MW)	Capital Cost for the Base Year	402.54
P&M ₍₀₎ (RsL/MW)	Plant & Machinery Cost for the Base Year	302.66
dn	Capital Cost Escalation Factor	17.09%
P&M_(n) (RsL/MW)	Plant & Machinery Cost for the nth Year (FY 2013-14)	354.37
CC_(n) (RsL/MW)	Capital Cost for the nth Year (FY2013-14)	471.31

5.3. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the RE Tariff Regulations, the debt and equity component for FY 2013-14 for Biomass Power Projects to be commissioned in FY 2013-14 works out to Rs. 329.92 Lakh per MW and Rs. 141.39 Lakh per MW respectively.

5.4. RETURN ON EQUITY

In accordance with Regulation 16.2 of the RE Tariff Regulations, the RoE works out as shown in the Table below:

Particulars	Biomass Project
Opening Equity (in Rs lakh per MW)	141.39

Particulars	Biomass Project
Return on Equity for the first 10 years @19% (Rs lakh per MW)	26.86
Return on Equity after first 10 years @24% (Rs lakh per MW)	33.93

5.5. INTEREST ON LOAN

As explained in Paragraph 2.4 of this Order, the interest rate of 12.87% (9.87% +300 basis points) has been considered for Biomass projects commissioned in FY 2013-14 with a gross opening loan amount of Rs. 329.92 Lakh per MW in FY 2013-14.

5.6. DEPRECIATION

In accordance with Regulation 15.2 of the RE Tariff Regulations, the depreciation will be charged at 7% for the first 10 years, and at 2% thereafter for the remaining useful period of 10 years for Biomass Projects.

5.7. INTEREST ON WORKING CAPITAL

Regulation 17.2 of the RE Tariff Regulations provides for computation of the working capital requirements of the Biomass Projects as under:

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

(b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;

(c) Maintenance spares @ 15% of operation and maintenance expenses"

Further, as explained above in Paragraph 2.5 of this Order, Interest on Working Capital shall be computed at an interest rate equivalent to average Base Rate of State Bank of

India during the previous year plus 350 basis points, i.e., 13.37% (9.87% + 350 basis points).

5.8. PLANT LOAD FACTOR (PLF)

In accordance with Regulation 37.1 of the RE Tariff Regulations, Threshold PLF

- a) During Stabilisation: 60%
- b) During the remaining period of the first year (after stabilisation): 70%
- c) From 2nd Year onward: 80% has been considered for determination of Tariff for Biomass Projects.

5.9. AUXILIARY POWER CONSUMPTION

In accordance with Regulation 38.1 of the RE Tariff Regulations, the Normative Auxiliary Consumption of 10.0% has been considered for determination of tariff of Biomass Projects.

5.10. STATION HEAT RATE

In accordance with Regulation 39.1 of the RE Tariff Regulations, the Normative Station Heat Rate of 3800 kcal per kWh has been considered for determination of tariff of Biomass Projects.

5.11. OPERATION AND MAINTENANCE EXPENSES

Regulation 40.1 of the RE Tariff Regulations specifies the normative Operation & Maintenance (O&M) expenses for Biomass Projects for FY 2010-11 as Rs. 21.41 Lakh per MW, which is to be escalated at the rate of 5.72% per annum over the Tariff Period as per Regulation 40.2 of the RE Tariff Regulations, for determination of the levelised tariff. Accordingly, the O&M expenses for Biomass Projects for FY 2013-14 have been considered as Rs. 25.30 Lakh per MW.

5.12. CALORIFIC VALUE

In accordance with Regulation 45.1 of the RE Tariff Regulations, the average Calorific Value of the Biomass Fuel (s) of 3611 kcal per kg has been considered for determination of tariff of Biomass Projects.

5.13. FUEL COST

Regulation 46 of the RE Tariff Regulations, specifies the Biomass fuel price during first three years of the Control Period (i.e. FY 2010-11, FY 2011-12 & FY 2012-13) as Rs. 2605 per MT, which shall be further linked to indexation mechanism as specified under Regulation 47.

In its Order dated 30 March, 2012 in Case No. 10 of 2012, the Commission determined the Biomass Price as Rs. 2950 per MT for FY 2012-13 based on biomass fuel price as stipulated by CERC for FY 2012-13 using equivalent heat value approach. Similarly, it is observed that CERC under its RE Tariff Order for FY 2013-14 has stipulated Biomass fuel price of Rs. 2887.73 per MT for Maharashtra and Calorific Value of 3300 kcal per kg which translates to fuel price in equivalent heat value (in Rs/ Million kCal) terms as Rs. 875 per Million kCal (i.e., Fuel Price (Rs. 2887.73 per MT) / Calorific Value (3300 kcal per kg) x 1000). Accordingly, the fuel cost of Biomass for FY 2013-14 has been considered as Rs. 3160/MT for determination of variable charge component of tariff of Biomass Power Projects for FY 2013-14.

5.14. LEVELISED TARIFF FOR BIOMASS POWER PROJECTS COMMISSIONED DURING FY 2013-14

In light of the above parameters and working out discount factor as 15.46% for levelisation of tariff for Biomass Projects, the generic tariffs for Biomass Power Projects for FY 2013-14 have been determined as under:

5.15. TARIFF FOR BIOMASS POWER PROJECTS COMMISSIONED DURING FY 2013-14

Levelling Fixed Charge (Rs/kWh)	Variable Charge for FY 2013-14 (Rs/kWh)	Tariff for FY 2013-14 (Rs/kWh)	Benefit of Accelerated Depreciation (if availed) (Rs/kWh)	Net Tariff (upon adjusting for accelerated depreciation benefit) (if availed) (Rs/kWh)
2.17	3.70	5.87	0.21	5.66

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 2013-14.

5.16. VARIABLE CHARGE FOR BIOMASS POWER PROJECTS COMMISSIONED PRIOR TO FY 2013-14

In accordance with Regulation 35.1 and 35.2 of MERC RE Tariff Regulations, the performance norms as specified under the Regulations shall be applicable only for new biomass power projects with effect from 1 April, 2013. Thus, the 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 Orders issued from time to time.

In view of the above, Specific Heat Rate and the Gross Calorific Value for biomass power projects commissioned prior to FY 2013-14 shall be governed as per the terms and conditions outlined under relevant biomass Tariff Orders (i.e. Case No. 37 of 2003 and Case 83 of 2008). Accordingly, the Commission has considered the Gross Calorific Value as 3200 kcal/kg and Station Heat Rate as 3650 kcal/kWh for existing biomass power projects. Based on the said parameters along with the revised fuel price applicable for FY 2013-14 of Rs 3160 per MT, the variable cost of the biomass power projects commissioned prior to FY 2013-14 works out to Rs 4.01 per kWh.

5.17. TARIFF FOR BIOMASS POWER PROJECTS COMMISSIONED PRIOR TO FY 2013-14

Fixed charge component of the Tariff for biomass power projects commissioned prior to FY 2013-14 shall be governed as per the terms and conditions outlined under relevant biomass Tariff Orders (i.e. Case No. 37 of 2003 and Case 83 of 2008).

Fixed Charge linked to year of operation (Rs/kWh)	Variable Charge for FY 2013-14 (Rs/kWh)	Tariff for FY 2013-14 (Rs/kWh)
1.70*	4.01	5.71

** Considering first year of operation as per Order dt 8 August, 2005 in Case No 37 of 2003 and Case no. 83 of 2008)*

6. NON-FOSSIL FUEL BASED CO-GENERATION PROJECT

6.1. KEY PROVISIONS OF RE TARIFF REGULATIONS

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

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

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

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

In addition, the Regulations also specify that the fuel price for each year of operation, of both existing and new non-fossil fuel based co-generation projects shall be adjusted based on an indexation mechanism with effect from 1 April, 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"

Accordingly, in case of Non fossil fuel based power projects commissioned on or prior to 31 March, 2013, the variable charge component of the tariff for FY 2013-14 shall be determined as outlined under Para 5.14 of this Order, whereas, fixed charge component of the tariff of such projects shall continue to be governed by the relevant Orders issued by the Commission.

6.2. CAPITAL COST OF NON-FOSSIL FUEL BASED CO-GENERATION PROJECTS COMMISSIONED DURING FY 2013-14

The Commission under Regulation 50.1 has specified the normative capital cost for the Non-fossil fuel based Co-generation project as Rs 398.07 Lakh per MW for FY 2010-11, which shall be linked to the indexation mechanism specified under Regulation 50.1 of the RE Tariff Regulations. In accordance to the above referred Regulation, the normative capital cost of Non-fossil fuel based Co-generation projects shall be Rs 466.08 Lakh per MW for FY 2013-14.

Capital Cost Indexation for Cogen and Bagasse based Power Projects (FY2013-14)

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	0.7
b	Weightage for Electrical Machinery Index	0.3
F ₁	Factor for Land and Civil Work	0.10
F ₂	Factor for Erection and Commissioning	0.09
F ₃	Factor for IDC and Financing	0.14

Month/Year	Electrical & Machinery		Iron & Steel	
	2012	2009	2012	2009
January	130.90	124.60	146.60	118.00
February	130.90	124.50	146.40	118.00
March	130.90	123.90	149.20	117.20
April	130.70	123.60	150.90	124.00
May	131.20	123.80	149.90	124.30
June	132.20	123.70	150.10	122.20
July	133.00	123.70	150.60	123.10
August	133.20	123.70	151.30	125.30
September	133.10	120.30	153.20	131.40
October	133.10	120.70	154.90	130.80
November	133.60	120.50	155.40	131.70
December	133.60	120.40	155.40	131.60
Average	132.02	122.78	151.16	124.80

Parameter	Description	Cost
$CC_{(0)}$ (RsL/MW)	Capital Cost for the Base Year	398.07
$P\&M_{(0)}$ (RsL/MW)	Plant & Machinery Cost for the Base Year	299.30
dn	Capital Cost Escalation Factor	17.09%
$P\&M_{(n)}$ (RsL/MW)	Plant & Machinery Cost for the nth Year (FY 2013-14)	350.44
$CC_{(n)}$ (RsL/MW)	Capital Cost for the nth Year (FY2013-14)	466.08

6.3. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the RE Tariff Regulations, the debt and equity component for FY 2013-14 for Non-fossil fuel based Co-generation project works out to Rs. 326.26 Lakh per MW and Rs. 139.82 Lakh per MW respectively.

6.4. RETURN ON EQUITY

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

Particulars	Non-fossil fuel based Co-generation project
Opening Equity (in Rs lakh per MW)	139.82

Particulars	Non-fossil fuel based Co-generation project
Return on Equity for the first 10 years @ 19% (Rs lakh per MW)	26.57
Return on Equity after first 10 years @ 24% (Rs lakh per MW)	33.56

6.5. INTEREST ON LOAN

As explained in Paragraph 2.4 of this Order, the interest rate of 12.87% (9.87% +300 basis points) has been considered for Non-fossil fuel based Co-generation project with a gross opening loan amount of Rs. 326.26 Lakh per MW in FY 2013-14.

6.6. DEPRECIATION

In accordance with Regulation 15 of the RE Tariff Regulations, the depreciation will be charged at 7% for the first 10 years, and at 2% thereafter for the remaining useful period of 10 years for Non-fossil fuel based Co-generation projects.

6.7. INTEREST ON WORKING CAPITAL

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

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

(b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;

(c) Maintenance spares @ 15% of operation and maintenance expenses"

Further, as explained above in Paragraph 2.5 of this Order, Interest on Working Capital shall be computed at an interest rate equivalent to average Base Rate of State Bank of India during the previous year plus 350 basis points, i.e., 13.37% (9.87% + 350 basis points).

6.8. OPERATION AND MAINTENANCE (O&M) EXPENSES

Regulation 62.1 of the RE Tariff Regulations specifies the normative Operation & Maintenance (O&M) expenses for Non-fossil fuel based Co-generation projects for FY 2010-11 as Rs. 14.11 Lakh per MW, which is to be escalated at the rate of 5.72% per annum over the Tariff Period as per Regulation 62.2 of the RE Tariff Regulations, for determination of the levelised tariff. Accordingly, the O & M expenses for Non-fossil fuel based Co-generation project for FY 2013-14 has been considered as Rs. 16.67 Lakh per MW.

6.9. PLANT LOAD FACTOR (PLF)

In accordance with Regulation 51.2 of the RE Tariff Regulations, Plant load Factor of 60% has been considered for determination of Tariff for Non-fossil fuel based Co-generation project.

6.10. AUXILIARY POWER CONSUMPTION

In accordance with Regulation 52.1 of the RE Tariff Regulations, the Auxiliary Consumption of 8.5% has been considered for determination of tariff of Biomass Projects.

6.11. STATION HEAT RATE

In accordance with Regulation 53.1 of the RE Tariff Regulations, the Normative Station Heat Rate of 3600 kcal per kWh has been considered for determination of tariff of Non-fossil fuel based Co-generation project.

6.12. CALORIFIC VALUE

In accordance with Regulation 54.1 of the RE Tariff Regulations, the average Calorific Value of the bagasse fuel of 2250 kcal per kg has been considered for determination of tariff of Non-fossil fuel based Co-generation project.

6.13. FUEL COST

Regulation 55.1 of the RE Tariff Regulations, specifies the Bagasse fuel price during first three years of the Control Period (i.e. FY 2010-11, FY 2011-12 & FY 2012-13) as Rs. 1832 per MT, which shall be further linked to indexation mechanism as specified under Regulation 56. The CERC, vide its suo motu Order dated 28 February, 2013 consider the

Bagasse cost for FY 2013-14 as Rs. 1963 per MT. Accordingly, the fuel cost of Bagasse for FY 2013-14 has been considered as Rs. 1963 per MT for determination of tariff of Non-fossil fuel based Co-generation project.

6.14. TARIFF FOR NON-FOSSIL FUEL BASED CO-GENERATION PROJECTS IN FY 2013-14

Non-fossil fuel based co-generation projects commissioned in FY 2013-14:

In light of the above parameters and the discount factor worked out as 15.46% for levelisation of tariff for Non-fossil fuel based Co-generation projects commissioned in FY 2013-14, the generic tariffs for Non-fossil fuel based Co-generation projects commissioned in FY 2013-14 have been determined as under:

Tariff for Non-Fossil based Bagasse Cogen Power Projects commissioned in FY 2013-14

Fixed Charge (Rs/kWh)	Variable Charge for FY 2013-14 (Rs/kWh)	Tariff for FY 2013-14 (Rs/kWh)	Benefit of Accelerated Depreciation (if availed) (Rs/kWh)	Net Levelised Tariff (upon adjusting for accelerated depreciation benefit) (if availed) (Rs/kWh)
2.38	3.43	5.81	0.27	5.54

6.15. NON-FOSSIL FUEL BASED CO-GENERATION PROJECTS COMMISSIONED PRIOR TO FY 2013-14:

In accordance with Regulation 49.1 and 49.2 of MERC RE Tariff Regulations, the performance norms shall be applicable only for new co-generation projects with effect from 1 April, 2013. Further, the norms in respect of Station Heat Rate, Gross Calorific Value and Auxiliary Consumption factor for existing co-generation projects shall be as stipulated under the respective RE tariff Orders issued from time to time.

However, based on the number of concerns and suggestions received from stakeholders, the Commission observes that the revision in variable charge norms may have to be undertaken in pursuance of the powers of the Commission under “Powers to Relax” as specified in Regulation 75.1 of the MERC RE Tariff Regulations, in order to ensure that co-generation projects continue to operate in the State.

The Commission thus, adopts the following formula for calculating the variable charge of bagasse based cogeneration projects commissioned prior to FY 2013-14:

$$VC = \frac{\text{Station Heat Rate}}{\text{Gross Calorific Value}} \times \frac{1}{(1-\text{Aux. Cons. Factor})} \times \frac{\text{Bagasse price in Rs. per MT}}{1000}$$

Considering the normative Station Heat Rate as 3600 kcal per kWh, Gross Calorific Value of bagasse as 2250 kcal per kg and auxiliary consumption factor of 8.5% as specified in the MERC RE Tariff Regulations and the bagasse price of Rs 1963 per MT, the variable charge works out to Rs. 3.43 per kWh.

Tariff for Non-Fossil based Bagasse Cogen Power Projects commissioned prior to FY 2013-14

Fixed Charge (Rs/kWh)	Variable Charge for FY 2013-14 (Rs/kWh)	Tariff for FY 2013-14 (Rs/kWh)
2.26*	3.43	5.69

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

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

The Commission has determined the Tariff for non-qualifying non-fossil fuel based co-generation (NQNFCC) projects as Rs 1.94 per kWh with escalation of 2% per annum on compounded basis under its Order (Case 26 of 2004) dated May 25, 2005. In its Order dated 30 March, 2012 in Case No 10 of 2012, the Tariff Rate for existing non-qualifying non-fossil fuel based co-generation projects for FY 2012-13 has been determined as Rs 2.23 per kWh. Accordingly, the Tariff Rate for existing non-qualifying non-fossil fuel based co-generation projects for FY 2013-14 works out to Rs 2.28 per kWh.

7. SOLAR PHOTOVOLTAIC (PV) PROJECTS

7.1. USEFUL LIFE

Regulation 2.1 (ff) of the RE Tariff Regulations defines 'useful life' in relation to a Unit of a generating station (including evacuation system) to mean the duration from the date of commercial operation (COD) till such time as specified under the RE Tariff Regulations

for such generation facility. Accordingly, as per Regulation 2.1 (ff), the useful life specified for Solar PV Projects is 25 years.

7.2. CONTROL PERIOD

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

7.3. TARIFF PERIOD

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

7.4. CAPITAL COST OF SOLAR PV PROJECTS

The CERC has notified RE Tariff Regulation 2012 for the second Control Period (i.e., FY 2012-13 to FY 2016-17). The CERC, vide its Suo-motu Order dated 28 February, 2013 has considered the normative capital cost for the Solar PV power projects to be commissioned in FY 2013-14 as Rs 800 Lakh per MW

The above capital cost norm shall also apply for Solar PV projects in Maharashtra for FY 2013-14, provided PPAs are signed after 31 March, 2013 and solar PV project is commissioned during FY 2013-14.

7.5. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the RE Tariff Regulations, the normative debt and equity component for Solar PV Projects shall be Rs. 560 Lakh per MW and Rs. 240 Lakh per MW, respectively.

7.6. RETURN ON EQUITY

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

Particulars	Solar PV
Opening Equity (in Rs lakh per MW)	240
Return on Equity for the first 10 years @ 19% (in Rs lakh per MW)	45.60
Return on Equity after first 10 years @24% (in Rs lakh per MW)	57.60

7.7. INTEREST ON LOAN

As explained in Paragraph 2.4 of this Order, the interest rate of 12.87% (9.87% + 300 basis points) has been considered for Solar PV Projects for loan amount of Rs. 560 Lakh per MW in FY 2013-14.

7.8. DEPRECIATION

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

7.9. INTEREST ON WORKING CAPITAL

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

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

(b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;

(c) Maintenance Spares @ 15% of operation and maintenance expenses"

Further, as explained above in Paragraph 2.5 of this Order, Interest on Working Capital shall be computed at an interest rate equivalent to average Base Rate of State Bank of India during the previous year plus 350 basis points, i.e., 13.37% (9.87% + 350 basis points).

7.10. OPERATION AND MAINTENANCE (O&M) EXPENSES

Regulation 67.1 of the RE Tariff Regulations specifies the normative O&M expenses for Solar PV projects for FY 2010-11 as Rs. 9.51 Lakh per MW, to be escalated at the rate of 5.72% per annum over the Tariff Period, for determination of the levelised tariff. Accordingly, the O&M expense norm for Solar PV projects for FY 2013-14 has been considered as Rs. 11.23 Lakh per MW.

7.11. CAPACITY UTILISATION FACTOR

In accordance with Regulation 66.1 of the RE Tariff Regulations, CUF of 19% has been considered for determination of Tariff for Solar PV power projects.

7.12. LEVELISED TARIFF FOR SOLAR PV POWER PROJECTS IN FY 2013-14

In light of the parameters discussed in the preceding paragraphs and with respect to the discount factor of 15.61 % derived based on the methodology stipulated in Paragraph 1.6 of this Order, the generic tariffs for Solar PV Projects for FY 2013-14 have been determined as under:

Tariff for New RE Projects-Solar Power Projects [Refer Regulation 3.1 of RE Tariff Regulations]				
Particulars	Tariff Period	Levelised Tariff (FY 2013-14)	Benefit of Accelerated Depreciation (if availed)	Net Levellised Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
		(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Solar PV	25	8.98	1.29	7.69

The above Tariff shall be applicable for Solar PV Projects wherein PPA are signed after 31 March, 2013 and projects are commissioned during FY 2013-14, 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 2013-14, wherein PPA are signed on or before 31 March, 2013, shall be as stipulated in the Commission's Generic RE Tariff Order (Case No. 10 of 2012) for RE technologies for the third year of the Control Period, issued on 30 March, 2012.

7.13. LEVELLISED TARIFF FOR SOLAR ROOFTOP PV AND OTHER SMALL SOLAR PROJECTS IN FY 2013-14

Regulation 68.1 of the RE Tariff Regulations specifies that the tariff for Solar Rooftop PV projects and other small solar projects will be Rs 0.50 per kWh higher than the Tariff specified for Solar PV projects in the Regulations. Accordingly, the Tariff for such Projects in FY 2013-14 shall be as follows:

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

Particular	Tariff Period	Levelised Total Tariff (FY 2013-14)	Benefit of Accelerated Depreciation (if availed)	Net Levelised Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
		(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Solar Power Projects				
Solar rooftop PV and other small solar power Projects	25	9.48	1.29	8.19

The above Tariff shall be applicable for Solar Rooftop PV and other small solar Projects wherein PPA are signed after 31 March, 2013 and projects are commissioned during FY 2013-14, 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 2013-14 wherein PPA are signed on or before 31 March, 2013, shall be as specified in the Commission's Generic RE Tariff Order (Case No. 10 of 2012) for RE technologies for the third year of the Control Period, issued on 30 March, 2012.

8. SOLAR THERMAL PROJECTS

8.1. USEFUL LIFE

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

8.2. CONTROL PERIOD

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

8.3. TARIFF PERIOD

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

8.4. CAPITAL COST OF SOLAR THERMAL PROJECTS

The CERC has notified RE Tariff Regulation 2012 for the second Control Period (i.e., FY 2012-13 to FY 2016-17). The CERC, vide its Suo-motu Order (Petition No. 243/SM/2012) dated 28 February, 2013 has consider the normative capital cost for the Solar thermal power projects to be commissioned in FY 2013-14 as Rs. 1200 Lakh per MW.

The above capital cost norm shall also apply for solar thermal projects in Maharashtra for FY 2013-14, provided PPAs are signed after 31 March, 2013 and the solar thermal power project is commissioned during FY 2013-14.

8.5. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the RE Tariff Regulations, the normative debt and equity component for solar thermal projects shall be Rs. 840 Lakh per MW and Rs. 360Lakh per MW, respectively.

8.6. RETURN ON EQUITY

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

Particulars	Solar Thermal
Opening Equity (in Rs lakh per MW)	360
Return on Equity for the first 10 years @ 19% (in Rs lakh per MW)	68.40
Return on Equity after first 10 years @ 24% (in Rs lakh per MW)	86.40

8.7. INTEREST ON LOAN

As explained in Paragraph 2.4 of this Order, the interest rate of 12.87% (9.87% + 300 basis points) has been considered for determination of Tariff for Solar thermal projects for the normative loan amount of Rs. 840 Lakh per MW in FY 2013-14.

8.8. DEPRECIATION

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

8.9. INTEREST ON WORKING CAPITAL

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

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

(b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;

(c) Maintenance Spares @ 15% of operation and maintenance expenses"

Further, as explained above in Paragraph 2.5 of this Order, Interest on Working Capital shall be computed at an interest rate equivalent to average Base Rate of State Bank of

India during the previous year plus 350 basis points, i.e., 13.37% (9.87% + 350 basis points).

8.10. OPERATION AND MAINTENANCE (O&M) EXPENSES

Regulation 72.1 of the RE Tariff Regulations specifies the normative O&M expenses for solar thermal power projects for FY 2010-11 as Rs. 13.74 Lakh per MW, to be escalated at the rate of 5.72% per annum over the Tariff Period for determination of the levelised tariff. Accordingly, O&M expenses norm for Solar thermal power projects for FY 2013-14 has been considered as Rs. 16.24 Lakh per MW.

8.11. CAPACITY UTILISATION FACTOR

In accordance with Regulation 71.1 of the RE Tariff Regulations, CUF of 23% is considered for determination of tariff for solar thermal projects.

8.12. AUXILIARY POWER CONSUMPTION

In accordance with Regulation 73.1 of the RE Tariff Regulations, the auxiliary power consumption factor for determination of tariff of solar thermal power projects is 10.00%.

8.13. LEVELISED TARIFF FOR SOLAR THERMAL PROJECTS IN FY 2013-14

In light of the parameters discussed in the preceding paragraphs and with respect to the discount factor of 15.61% derived based on the methodology stipulated in Paragraph 1.6 of this Order, the generic tariff for Solar Thermal Projects for FY 2013-14 has been determined as under:

Tariff for New Solar Thermal Power Project to be commissioned in FY 2013-14

Particular	Tariff Period	Levelised Tariff (FY 2013-14)	Benefit of Accelerated Depreciation (if availed)	Net Levelised Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
		(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Solar Thermal	25	12.31	1.60	10.71

The above Tariff shall be applicable for Solar thermal power Projects wherein PPAs are signed after 31 March, 2013 and projects are commissioned during FY 2013-14, 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 2013-14 wherein PPA are signed on or before 31 March, 2012, shall be as specified in the Commission's Generic RE Tariff Order (Case No. 10 of 2012) for RE technologies for the third year of the Control Period, issued on 30 March, 2012.

9. 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
1	Wind Power Projects	
	Wind Zone-1	Annexure 2A
	Wind Zone-2	Annexure 2B
	Wind Zone-3	Annexure 2C
	Wind Zone-4	Annexure 2D
2	Small Hydro Power Projects	
	SHP Projects Less than 5 MW	Annexure 3A
	SHP Projects between 5 MW and 25 MW	Annexure 3B
3	Biomass Power Project	Annexure 4
4	Non-Fossil Fuel Based Co-Generation Project	Annexure 5
5	Solar Projects	
	Solar PV Projects	Annexure 6A
	Solar Thermal Projects	Annexure 6B

Sd/-

(Vijay L. Sonavane)
Member

Sd/-

(V. P. Raja)
Chairman

Annexure – 1A**List of stakeholders submitted the comments/suggestion**

1.	Maharashtra Energy Development Agency
2.	Maharashtra State Electricity Distribution Company Limited.
3.	Maharashtra State Co.op. Sugar Factories Federation Ltd.
4.	Indian Biomass Power Association
5.	Bajaj Finserv Ltd.
6.	Torrent Power Ltd.
7.	Kenersys India Pvt. Ltd.
8.	Orient Green Power Co. Ltd.
9.	GE India
10.	Vidyut Urja Equipments P. Ltd
11.	Maha Co-Gen Green Power Producers Association
12.	Maharashtra Biomass Energy Developers Association
13.	Kalyani Renewable Energy (I) Ltd.
14.	ShriVitthal Ramdas Shah
15.	New Asian Infrastructure Dev. P. Ltd.
16.	Regen Powertech Pvt. Ltd.
17.	Indian Wind Turbine Mfrs. Association
18.	Inox Renewables Ltd.
19.	Co-generation Association of India
20.	Indian Wind Energy Association
21.	Gaps Power & Infrastructure P. Ltd.
22.	Mytrah Energy (I) Ltd.
23.	Reliance Power Ltd.
24.	Surajbari Windfarm Development P. Ltd.
25.	Moserbaer Engineering & Constructions Ltd.
26.	Celerity Power
27.	Yash Agro Energy limited
28.	GMT Mining & Power Pvt. Ltd.
29.	Gokhale Institute of Politics and Economies, Pune
30.	Shri. Ulhas Pandharinath Chaudhary
31.	Shri. M.P.Limaye
32.	Dalmiya Sugar Ltd.
33.	Tata Power Company ltd.

Annexure – 1B**List of stakeholders attended the Public hearing held on 12 February 2013**

1	Shri M. K. Deore
2	Shri Abhijit Deshpande, MSEDCL
3	Shri Ram Dotonde
4	Shri Ravindra Sangle
5	Shri S. H. Waikar
6	Shri Abhay Kulkarni
7	Shri Vikas Nikumbh
8	Shri D. H. Kulkarni
9	Shri S. P. Raje
10	Dr. M. S. Kale
11	Shri Anshumaan Bhatnagar
12	Shri Rahul Dasari
13	Shri Ashish Tikhe
14	Ms Soniya Chawla
15	Shri Jagdish F
16	Shri V V V Surao
17	Shri A Vinay Kumar
18	Shri P Santosh
19	Shri A H Pandit
20	Shri Rajat Tomar
21	Shri Arvind P Patil
22	Shri R T Ale
23	Shri Satyen Kanabar
24	Shri Savio Rego
25	Shri Sandeep
26	Shri Abhijit Dhamdhare
27	Shri Madhukar Deshmukh
28	Shri H Subramanian
29	Smt S M Mainikar
30	Smt B A Choudhary
31	Smt R B Kolhe
32	Shri Abhishek Khare
33	Shri Subhash Gupta
34	Shri Pradeep Mittal
35	Shri Nitin

36	Shri Sudhir Dive
37	Shri Amit Kediya
38	Shri Harshal Bhaskare
39	Shri Vijay Chiplunkar
40	Shri Ulhas P C
41	Shri G J Thakkar
42	Shri A Gurumethan
43	Ms Priyanka Aswale
44	Shri Kuldeep Kulkarni
45	Shri Shailendra Singh
46	Shri C R Vishwanathan
47	Shri Manish Yesurkar
48	Shri Kiran Patil
49	Shri Anshu Yadav
50	Shri Jharkar
51	Shri Mangesh
52	Shri R G Tambe
53	Shri Abhijeet Gupta
54	Shri Raj Kumar
55	Shri. S.A. Patil, MEDA

**Annexure – 2A
(Wind Zone-1)**

Form 1.1 Assumptions Parameters				Wind Zone	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	1
1	Power Generation	<u>Capacity</u>	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	20%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	540.66
3	Sources of Fund	<u>Debt: Equity</u>	Tariff Period	Years	13
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	378.46
			Total Equity Amount	Rs Lacs	162.20
		<u>Debt Component</u>	Loan Amount	Rs Lacs	378.46
			Repayment Period(incl'd Moratorium)	years	10
			Interest Rate	%	12.87%
		<u>Equity Component</u>	Equity amount	Rs Lacs	162.20
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate		15.61%
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	32.445%
			MAT Rate (for first 10 years)	%	20.008%
		<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 Maintenance Spare Receivables for Debtors Interest On Working Capital		Months	1
			(% of O&M exepenses)		15.00%
				Months	2
				%	13.37%
6	Operation & Maintenance	power plant (FY13-14)		Rs Lakh	8.12
		<u>Total O & M Expenses Escalation</u>		%	5.72%

Form 1.2 Form Template for (Wind Power Projects under Zone -1) :Determination of Tariff Component																											
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
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	

Determination of Additional Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	15%
Additional Depreciation	20%
Income Tax (MAT)	20.008%
Income Tax (Normal Rates)	32.445%
Capital Cost	540.66

Years	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%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs. Lakh	14.27	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	15.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation																									
Opening	%	100.0%	82.5%	70.1%	59.6%	50.7%	43.1%	36.6%	31.1%	26.4%	22.5%	19.1%	16.2%	13.8%	11.7%	10.0%	8.5%	7.2%	6.1%	5.2%	4.4%	3.8%	3.2%	2.7%	2.3%
Allowed during the year	%		17.50%	12.38%	10.52%	8.94%	7.60%	6.46%	5.49%	4.67%	3.97%	3.37%	2.87%	2.44%	2.07%	1.76%	1.50%	1.27%	1.08%	0.92%	0.78%	0.68%	0.56%	0.48%	0.35%
Closing	%		82.5%	70.1%	59.6%	50.67%	43.07%	36.61%	31.11%	26.45%	22.48%	19.11%	16.24%	13.81%	11.73%	9.97%	8.48%	7.21%	6.13%	5.21%	4.43%	3.78%	3.20%	2.72%	2.31%
Accelerated Depm.	Rs. Lakh	94.61	66.91	56.87	48.34	41.09	34.93	29.69	25.23	21.45	18.23	15.50	13.17	11.20	9.52	8.09	6.88	5.84	4.97	4.22	3.59	3.05	2.59	2.20	1.87

Net Depreciation Benefit	Rs. Lakh	80.34	38.36	28.32	19.79	12.54	6.38	1.14	-3.31	-7.10	-10.32	-13.05	-15.37	-17.35	-19.03	-20.46	-21.67	-22.70	-10.60	4.22	3.59	3.05	2.59	2.20	1.87
Tax Benefit	Rs. Lakh	26.07	12.45	9.19	6.42	4.07	2.07	0.37	-1.07	-2.30	-3.35	-4.23	-4.99	-5.63	-6.17	-6.64	-7.03	-7.37	-3.44	1.37	1.16	0.99	0.84	0.72	0.61
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	1.75	1.75	1.75	1.75
Per unit benefit	Rs/Unit	2.96	0.71	0.52	0.37	0.23	0.12	0.02	-0.06	-0.13	-0.19	-0.24	-0.28	-0.32	-0.35	-0.38	-0.40	-0.42	-0.20	0.08	0.07	0.06	0.05	0.04	0.03
Discounting Factor		1.00	0.86	0.75	0.65	0.56	0.46	0.42	0.36	0.31	0.27	0.23	0.20	0.18	0.15	0.13	0.11	0.10	0.09	0.07	0.06	0.05	0.04	0.04	0.03
Applicable Discounting Factor		1.00	0.93	0.80	0.70	0.60	0.52	0.45	0.39	0.34	0.29	0.25	0.22	0.19	0.16	0.14	0.12	0.11	0.09	0.08	0.07	0.06	0.05	0.04	0.04

Levelised benefit	0.35	Rs/Unit
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Annexure – 2B
(Wind Zone-2)

Form 1.1 Assumptions Parameters				Wind Zone	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	2
1	Power Generation	<u>Capacity</u>	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	23%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	540.66
3	Sources of Fund	<u>Debt: Equity</u>	Tariff Period	Years	13
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	378.46
			Total Equity Amount	Rs Lacs	162.20
		<u>Debt Component</u>	Loan Amount	Rs Lacs	378.46
			Repayment Period(incl'd Moratorium)	years	10
			Interest Rate	%	12.87%
		<u>Equity Component</u>	Equity amount	Rs Lacs	162.20
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate		15.61%
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	32.445%
			MAT Rate (for first 10 years)	%	20.008%
		<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)		15.00%
		Receivables for Debtors		Months	2
		Interest On Working Capital		%	13.37%
6	Operation & Maintenance	power plant (FY13-14)		Rs Lakh	8.12
		<u>Total O & M Expenses Escalation</u>		%	5.72%

Form 1.2 Form Template for (Wind Power Projects under Zone -2) : Determination of Tariff Component																											
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
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	

Determination of Additional Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	15%
Additional Depreciation	20%
Income Tax (MAT)	20.008%
Income Tax (Normal Rates)	32.445%
Capital Cost	540.66

Years	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%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	14.27	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	15.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100.0%	82.5%	70.1%	59.6%	50.7%	43.1%	36.6%	31.1%	26.4%	22.5%	19.1%	16.2%	13.8%	11.7%	10.0%	8.5%	7.2%	6.1%	5.2%	4.4%	3.8%	3.2%	2.7%	2.3%	2.0%
Allowed during the year	%	17.50%	12.38%	10.52%	8.94%	7.60%	6.46%	5.49%	4.67%	3.97%	3.37%	2.87%	2.44%	2.07%	1.76%	1.50%	1.27%	1.08%	0.92%	0.78%	0.66%	0.56%	0.48%	0.41%	0.35%	0.29%
Closing	%	82.5%	70.1%	59.6%	50.67%	43.07%	36.61%	31.11%	26.45%	22.48%	19.1%	16.24%	13.81%	11.73%	9.97%	8.48%	7.21%	6.13%	5.27%	4.43%	3.76%	3.20%	2.72%	2.31%	1.95%	1.67%
Accelerated Depm.	Rs Lakh	94.61	66.91	56.87	48.34	41.09	34.93	29.69	25.23	21.45	18.23	15.50	13.17	11.20	9.52	8.09	6.88	5.84	4.97	4.22	3.59	3.05	2.59	2.20	1.87	1.59

Net Depreciation Benefit	Rs Lakh	80.34	38.36	28.32	19.79	12.54	6.38	1.14	-3.31	-7.10	-10.32	-13.05	-15.37	-17.35	-19.03	-20.46	-21.67	-22.70	-10.60	4.22	3.59	3.05	2.59	2.20	1.87	1.59
Tax Benefit	Rs Lakh	26.07	12.45	9.19	6.42	4.07	2.07	0.37	-1.07	-2.30	-3.35	-4.23	-4.99	-5.63	-6.17	-6.64	-7.03	-7.37	-3.44	1.37	1.16	0.99	0.84	0.72	0.61	0.52
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	2.01	2.01	2.01	2.01	2.01
Per unit benefit	Rs/Unit	2.59	0.62	0.46	0.32	0.20	0.10	0.02	-0.05	-0.11	-0.17	-0.21	-0.25	-0.28	-0.31	-0.33	-0.35	-0.37	-0.17	0.07	0.06	0.05	0.04	0.04	0.03	0.03
Discounting Factor		1.00	0.86	0.75	0.65	0.56	0.48	0.42	0.36	0.31	0.27	0.23	0.20	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	0.05	0.05	0.04	0.04	0.03
Applicable Discounting Factor		1.00	0.93	0.80	0.70	0.60	0.52	0.45	0.39	0.34	0.29	0.25	0.22	0.19	0.16	0.14	0.12	0.11	0.09	0.08	0.07	0.06	0.05	0.04	0.04	0.03

Levelised benefit	0.31
Rs/Unit	

Annexure – 2C
(Wind Zone-3)

Form 1.1 Assumptions Parameters				Wind Zone	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	3
1	Power Generation	<u>Capacity</u>	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	27%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	540.66
3	Sources of Fund	<u>Debt: Equity</u>	Tariff Period	Years	13
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	378.46
			Total Equity Amount	Rs Lacs	162.20
		<u>Debt Component</u>	Loan Amount	Rs Lacs	378.46
			Repayment Period(incl'd Moratorium)	years	10
			Interest Rate	%	12.87%
		<u>Equity Component</u>	Equity amount	Rs Lacs	162.20
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate		15.61%
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	32.445%
			MAT Rate (for first 10 years)	%	20.008%
		<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 Maintenance Spare Receivables for Debtors Interest On Working Capital			
				Months	1
			(% of O&M exepenses)		15.00%
				Months	2
				%	13.37%
6	Operation & Maintenance	power plant (FY13-14) <u>Total O & M Expenses Escalation</u>		Rs Lakh	8.12
				%	5.72%

[illegible]

Determination of Additional Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	15%
Additional Depreciation	20%
Income Tax (MAT)	20.000%
Income Tax (Normal Rates)	32.445%
Capital Cost	540.08

Years	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	14.27	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	16.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100.0%	82.5%	70.1%	59.6%	50.7%	43.1%	36.6%	31.1%	26.4%	22.5%	19.1%	16.2%	13.8%	11.7%	10.0%	8.5%	7.2%	6.1%	5.2%	4.4%	3.8%	3.2%	2.7%	2.3%	2.0%
Allowed during the year	%	17.50%	12.38%	10.52%	8.94%	7.60%	6.48%	5.49%	4.67%	3.97%	3.37%	2.87%	2.44%	2.07%	1.78%	1.53%	1.27%	1.08%	0.92%	0.78%	0.68%	0.58%	0.48%	0.41%	0.35%	0.29%
Closing	%	82.5%	70.1%	59.6%	50.67%	43.07%	36.61%	31.11%	26.45%	22.48%	19.11%	16.24%	13.81%	11.73%	9.97%	8.48%	7.21%	6.13%	5.21%	4.43%	3.78%	3.20%	2.72%	2.31%	1.98%	1.67%
Accelerated Depn.	Rs Lakh	94.61	66.91	56.87	48.34	41.08	34.93	29.69	25.23	21.45	18.23	15.50	13.17	11.20	9.52	8.09	6.88	5.84	4.97	4.22	3.59	3.05	2.59	2.20	1.87	1.59

Net Depreciation Benefit	Rs Lakh	80.34	38.36	28.32	19.79	12.54	6.38	1.14	-3.31	-7.10	-10.32	-13.05	-15.37	-17.35	-19.03	-20.46	-21.67	-22.70	-10.60	4.22	3.59	3.05	2.59	2.20	1.87	1.59
Tax Benefit	Rs Lakh	28.07	12.45	9.19	6.42	4.07	2.07	0.37	-1.07	-2.30	-3.35	-4.23	-4.99	-5.63	-6.17	-6.64	-7.03	-7.37	-3.44	1.37	1.16	0.99	0.84	0.72	0.61	0.52
Energy generation	MU	118	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237
Per unit benefit	Rs/Unit	2.20	0.53	0.39	0.27	0.17	0.09	0.02	-0.05	-0.10	-0.14	-0.18	-0.21	-0.24	-0.26	-0.28	-0.30	-0.31	-0.15	0.06	0.05	0.04	0.04	0.03	0.03	0.02
Discounting Factor		1.00	0.86	0.75	0.65	0.56	0.46	0.42	0.36	0.31	0.27	0.23	0.20	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03
Applicable Discounting Factor		1.00	0.93	0.80	0.70	0.60	0.52	0.45	0.39	0.34	0.29	0.25	0.22	0.19	0.16	0.14	0.12	0.11	0.09	0.08	0.07	0.06	0.05	0.04	0.04	0.03

Levelised benefit	0.26	Rs/Unit
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Annexure – 2D
(Wind Zone-4)

Form 1.1 Assumptions Parameters				Wind Zone	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	4
1	Power Generation	<u>Capacity</u>	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	30%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	540.66
3	Sources of Fund	<u>Debt: Equity</u>	Tariff Period	Years	13
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	378.46
			Total Equity Amount	Rs Lacs	162.20
		<u>Debt Component</u>	Loan Amount	Rs Lacs	378.46
			Repayment Period(incl'd Moratorium)	years	10
			Interest Rate	%	12.87%
		<u>Equity Component</u>	Equity amount	Rs Lacs	162.20
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate		15.61%
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	32.445%
			MAT Rate (for first 10 years)	%	20.008%
		<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 Maintenance Spare Receivables for Debtors Interest On Working Capital		Months	1
			(% of O&M exepenses)		15.00%
				Months	2
				%	13.37%
6	Operation & Maintenance	<u>power plant (FY13-14)</u> <u>Total O & M Expenses Escalation</u>		Rs Lakh	8.12
				%	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

Determination of Additional Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	15%
Additional Depreciation	20%
Income Tax (MAT)	20.008%
Income Tax (Normal Rates)	32.445%
Capital Cost	540.66

Years	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%	2.68%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	14.27	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	28.55	15.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation																									
Opening	%	100.0%	82.5%	70.1%	59.6%	50.7%	43.1%	36.6%	31.1%	26.4%	22.5%	19.1%	16.2%	13.8%	11.7%	10.0%	8.5%	7.2%	6.1%	5.2%	4.4%	3.8%	3.2%	2.7%	2.3%
Allowed during the year	%	17.50%	12.38%	10.52%	8.94%	7.60%	6.46%	5.48%	4.67%	3.97%	3.37%	2.87%	2.44%	2.07%	1.76%	1.50%	1.27%	1.08%	0.92%	0.78%	0.66%	0.56%	0.48%	0.41%	0.35%
Closing	%	82.5%	70.1%	59.6%	50.67%	43.07%	36.61%	31.11%	26.45%	22.48%	19.11%	16.24%	13.81%	11.73%	9.97%	8.48%	7.21%	6.13%	5.21%	4.43%	3.76%	3.20%	2.72%	2.31%	1.98%
Accelerated Depn.	Rs Lakh	94.61	66.91	56.87	48.34	41.09	34.93	29.69	25.23	21.45	18.23	15.50	13.17	11.20	9.52	8.09	6.88	5.94	4.97	4.22	3.59	3.05	2.59	2.20	1.87

Net Depreciation Benefit	Rs Lakh	80.34	38.36	28.32	19.79	12.54	6.38	1.14	-3.31	-7.10	-10.32	-13.05	-15.37	-17.35	-19.03	-20.46	-21.67	-22.70	-10.60	4.22	3.59	3.05	2.59	2.20	1.87
Tax Benefit	Rs Lakh	26.07	12.45	9.19	6.42	4.07	2.07	0.37	-1.07	-2.30	-3.35	-4.23	-4.99	-5.63	-6.17	-6.64	-7.03	-7.37	-3.44	1.37	1.16	0.99	0.84	0.72	0.61
Energy generation	MU	1.31	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63
Per unit benefit	Rs/Unit	1.98	0.47	0.35	0.24	0.15	0.08	0.01	-0.04	-0.09	-0.13	-0.16	-0.19	-0.21	-0.23	-0.25	-0.27	-0.28	-0.13	0.05	0.04	0.04	0.03	0.03	0.02
Discounting Factor		1.00	0.86	0.75	0.65	0.56	0.48	0.42	0.36	0.31	0.27	0.23	0.20	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	0.05	0.04	0.04	0.03
Applicable Discounting Factor		1.00	0.93	0.80	0.70	0.60	0.52	0.45	0.39	0.34	0.29	0.25	0.22	0.19	0.16	0.14	0.12	0.11	0.09	0.08	0.07	0.06	0.05	0.04	0.03

Levelised benefit	0.23	Rs/Unit
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Annexure – 3A
(SHP above 1 MW and upto and including 5 MW)

Form 1.1 Assumptions Parameters					Capacity
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	<=5 MW
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	30%
			Auxilliary Consumption		1%
			Useful Life	Years	35
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	577.54
3	Sources of Fund		Tariff Period	Years	35
		<u>Debt: Equity</u>			
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	404.28
			Total Equity Amout	Rs Lacs	173.26
		<u>Debt Component</u>			
			Loan Amount	Rs Lacs	404.28
			Repayment Period(inclcd Moratorium)	years	10
			Interest Rate	%	12.87%
		<u>Equity Component</u>			
			Equity amount	Rs Lacs	173.26
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate		15.61%
4	Financial Assumptions	<u>Fiscal Assumptions</u>			
			Income Tax	%	32.445%
			MAT Rate (for first 10 years)	%	20.008%
		<u>Depreciation</u>			
			Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	0.80%
5	Working Capital		Years for 7% rate		10
		<u>For Fixed Charges</u>			
		O&M Charges		Months	1
		Maintenance Spare	(% of O&M exepenses)		15%
		Receivables for Debtors		Months	2
6	Operation & Maintenance	Interest On Working Capital		%	13.37%
		power plant (FY13-14)		Rs Lakh	21.24
		<u>Total O & M Expenses Escalation</u>		%	5.72%

Form 1.2 Form Template for (Small Hydro Projects of Capacity <=5 MW) : Determination of Tariff Component																																					
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Net Generation	MU		2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M Expenses	Rs Lakh		21.24	22.45	23.74	25.10	26.53	28.05	29.65	31.35	33.14	35.04	37.04	39.16	41.40	43.77	46.28	48.92	51.72	54.68	57.81	61.11	64.61	68.31	72.21	76.34	80.71	85.33	90.21	95.37	100.82	106.59	112.69	119.13	125.95	133.15	140.77
Depreciation	Rs Lakh		40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43	40.43
Interest on term loan	Rs Lakh		49.44	44.23	39.03	33.83	28.62	23.42	18.21	13.01	7.81	2.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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		3.96	3.91	3.86	3.82	3.78	3.74	3.71	3.68	3.66	3.65	3.68	3.20	3.32	3.45	3.58	3.73	3.88	4.04	4.22	4.40	4.59	4.79	5.00	5.23	5.47	5.72	5.99	6.27	6.57	6.88	7.22	7.57	7.94	8.34	8.75
Return on Equity	Rs Lakh		32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92	32.92
Total Fixed Cost	Rs Lakh		147.99	143.95	139.98	136.09	132.28	128.56	124.93	121.39	117.96	114.64	86.33	88.56	90.93	93.42	96.06	98.86	101.81	104.93	108.23	111.71	115.40	119.30	123.42	127.78	132.38	137.25	142.40	147.84	153.59	159.68	166.11	172.91	180.09	187.69	195.72
Per unit Fixed Cost	Rs/Wh	4.92	5.69	5.53	5.38	5.23	5.08	4.94	4.80	4.67	4.53	4.41	3.32	3.40	3.49	3.59	3.69	3.80	3.91	4.03	4.16	4.29	4.44	4.59	4.74	4.91	5.09	5.28	5.47	5.68	5.90	6.14	6.38	6.65	6.92	7.21	7.52
Levelised tariff corresponding to Useful life																																					
Per Unit Cost of Generation	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M expn	Rs/KWh	1.24	0.82	0.86	0.91	0.96	1.02	1.08	1.14	1.21	1.27	1.35	1.42	1.51	1.59	1.68	1.78	1.88	1.99	2.10	2.22	2.35	2.48	2.63	2.78	2.93	3.10	3.28	3.47	3.67	3.88	4.10	4.33	4.58	4.84	5.12	5.41
Depreciation	Rs/KWh	1.24	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	
Int. on term loan	Rs/KWh	0.95	1.90	1.70	1.50	1.30	1.10	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Int. on working capital	Rs/KWh	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.12	0.12	0.13	0.13	0.14	0.14	0.15	0.16	0.16	0.17	0.18	0.18	0.19	0.20	0.21	0.22	0.23	0.24	0.25	0.26	0.28	0.29	0.31	0.32	0.34
RoE	Rs/KWh	1.34	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	
Total COG	Rs/KWh	4.92	5.69	5.53	5.38	5.23	5.08	4.94	4.80	4.67	4.53	4.41	3.32	3.40	3.49	3.59	3.69	3.80	3.91	4.03	4.16	4.29	4.44	4.59	4.74	4.91	5.09	5.28	5.47	5.68	5.90	6.14	6.38	6.65	6.92	7.21	7.52
COG exd. RoE																																					
Discount Factor			1	0.86	0.75	0.65	0.56	0.48	0.42	0.36	0.31	0.27	0.23	0.20	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	0.05	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	
Fixed Cost	4.92		127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91	127.91
Levelised Tariff	Rs/Unit	4.92																																			

Determination of Additional Depreciation for Small Hydro Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	20.008%
Income Tax (Normal Rates)	32.445%
Capital Cost	577.54

Years	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Book Depreciation	%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	15.25	30.49	30.49	30.49	30.49	30.49	30.49	30.49	30.49	30.49	30.49	30.49	30.49	30.49	30.49	30.49	16.63	0.00	0.00	0.00	0.00	0.00	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%	50%	10%	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	%	50.00%	40.00%	8.00%	1.50%	0.32%	0.06%	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%	0.00%
Closing	%	50.0%	10.0%	2.0%	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%	0.00%	0.00%
Accelerated Depm.	Rs Lakh	288.77	231.02	46.20	9.24	1.85	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	273.52	200.52	15.71	-21.25	-28.65	-30.12	-30.42	-30.48	-30.49	-30.49	-30.49	-30.49	-30.49	-30.49	-30.49	-30.49	-16.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Rs Lakh	88.74	65.06	5.10	-6.90	-9.29	-9.77	-9.87	-9.89	-9.89	-9.89	-9.89	-9.89	-9.89	-9.89	-9.89	-9.89	-5.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	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
	Applicable Discounting Factor	1.00	0.93	0.80	0.70	0.60	0.52	0.45	0.39	0.34	0.29	0.25	0.22	0.19	0.16	0.14	0.12	0.11	0.09	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01

Levelised benefit	0.58	Rs/Unit
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Annexure – 3B
(above 5 MW to 25 MW)

Form 1.1 Assumptions Parameters

Capacity

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	>5 up to 25 MW
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	30%
			Auxilliary Consumption		1%
			Useful Life	Years	35
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	525.46
3	Sources of Fund		Tariff Period	Years	13
		<u>Debt: Equity</u>	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	367.82
			Total Equity Amout	Rs Lacs	157.64
		<u>Debt Component</u>	Loan Amount	Rs Lacs	367.82
			Repayment Period(incld Moratorium)	years	10
			Interest Rate	%	12.87%
		<u>Equity Component</u>	Equity amount	Rs Lacs	157.64
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Discount Rate		15.61%
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	32.445%
			MAT Rate (for first 10 years)	%	20.008%
		<u>Depreciation</u>	Depreciation Rate for first 10 years	%	7.00%
			Depreciation Rate 11th year onwards	%	0.80%
			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
		Interest On Working Capital		%	13.37%
6	Operation & Maintenance				
		power plant (FY13-14)		Rs Lakh	15.00
		<u>Total O & M Expenses Escalation</u>		%	5.72%

Form 12 Form Template for (Small Hydro Projects of Capacity >5 up 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		15.00	15.86	16.77	17.72	18.74	19.81	20.94	22.14	23.41	24.75	26.16	27.66	29.24	30.91	32.68	34.55	36.53	38.62	40.82	43.16	45.63	48.24	51.00	53.91	57.00	60.26	63.71	67.35	71.20	75.27	79.58	84.13	88.94	94.03	99.41
Depreciation	Rs Lakh		36.78	36.78	36.78	36.78	36.78	36.78	36.78	36.78	36.78	36.78	36.78	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20
Interest on term loan	Rs Lakh		44.98	40.25	35.51	30.78	26.04	21.31	16.57	11.84	7.10	2.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Interest on working Capital	Rs Lakh		3.37	3.31	3.25	3.19	3.14	3.09	3.04	3.00	2.96	2.93	2.89	2.87	2.85	2.85	2.75	2.85	2.96	3.07	3.19	3.32	3.45	3.60	3.75	3.91	4.08	4.25	4.44	4.64	4.85	5.08	5.31	5.56	5.82	6.10	6.40
Return on Equity	Rs Lakh		29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	29.95	
Total Fixed Cost	Rs Lakh		130.08	126.14	122.26	118.43	114.65	110.94	107.29	103.71	100.21	96.78	70.59	72.17	73.83	75.60	77.46	79.44	81.52	83.72	86.05	88.52	91.12	93.87	96.78	99.86	103.11	106.55	110.19	114.03	118.09	122.39	126.93	131.73	136.81	142.17	147.84
Per unit Fixed Cost	Rs/Wh	4.21	5.00	4.85	4.70	4.55	4.41	4.26	4.12	3.99	3.85	3.72	2.71	2.77	2.84	2.91	2.98	3.05	3.13	3.22	3.31	3.40	3.50	3.61	3.72	3.84	3.96	4.10	4.24	4.38	4.54	4.70	4.88	5.06	5.26	5.46	5.68
Levelised tariff corresponding to Useful life																																					
Per Unit Cost of Generation	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M expn	Rs/Wh	0.88	0.59	0.61	0.64	0.68	0.72	0.76	0.80	0.85	0.90	0.95	1.01	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	2.32	2.45	2.59	2.74	2.89	3.06	3.23	3.42	3.61	3.82
Depreciation	Rs/Wh	1.13	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	
Int. on term loan	Rs/Wh	0.86	1.73	1.55	1.36	1.18	1.00	0.82	0.64	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Int. on working capital	Rs/Wh	0.12	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.09	0.09	0.10	0.10	0.11	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
RoE	Rs/Wh	1.22	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	
Total COG	Rs/Wh	4.21	5.00	4.85	4.70	4.55	4.41	4.26	4.12	3.99	3.85	3.72	2.71	2.77	2.84	2.91	2.98	3.05	3.13	3.22	3.31	3.40	3.50	3.61	3.72	3.84	3.96	4.10	4.24	4.38	4.54	4.70	4.88	5.06	5.26	5.46	5.68
COG exd. RoE																																					
Discount Factor			1	0.86	0.75	0.65	0.56	0.48	0.42	0.36	0.31	0.27	0.23	0.20	0.18	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	0.01	0.01	0.01	0.01	0.01	0.01		
Fixed Cost	4.21		109.45	105.45	103.45	101.45	99.45	97.45	95.45	93.45	91.45	89.45	87.45	85.45	83.45	81.45	79.45	77.45	75.45	73.45	71.45	69.45	67.45	65.45	63.45	61.45	59.45	57.45	55.45	53.45	51.45	49.45	47.45	45.45	43.45	41.45	
Levelised Tariff	4.21	Rs/Unit																																			

Determination of Additional Depreciation for Small Hydro Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	20.008%
Income Tax (Normal Rates)	32.445%
Capital Cost	525.46

Years	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%	2.98%	0.00%	0.00%	0.00%	0.00%	0.00%	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	13.87	27.74	27.74	27.74	27.74	27.74	27.74	27.74	27.74	27.74	27.74	27.74	27.74	27.74	27.74	27.74	27.74	15.13	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	0.00	0.00

Accelerated Depreciation

Opening	100%	50%	10%	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	50.00%	40.00%	8.00%	1.60%	0.32%	0.06%	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%	0.00%
Closing	50.0%	10.0%	2.0%	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%	0.00%	0.00%
Accelerated Depn.	262.73	210.18	42.04	8.41	1.68	0.34	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	248.86	82.44	14.29	-19.34	-26.06	-27.41	-27.68	-27.73	-27.74	-27.74	-27.74	-27.74	-27.74	-27.74	-27.74	-27.74	-27.74	-45.13	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
	Tax Benefit	Rs Lakh	80.74	59.19	4.64	-6.27	-8.46	-8.89	-9.00	-9.00	-9.00	-9.00	-9.00	-9.00	-9.00	-9.00	-9.00	-9.00	-4.91	0.00	0.00	0.00	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
Applicable Discounting Factor		1.00	0.93	0.80	0.70	0.60	0.52	0.45	0.39	0.34	0.29	0.25	0.22	0.19	0.16	0.14	0.12	0.11	0.09	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01

Levelised benefit	0.53	Rs/Unit
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Annexure – 4 (Bio Mass Power Project)

2.1 Form Template for Biomass Power Projects- Other

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Auxiliary Consumption during stabilisation	%	10%
			Auxiliary Consumption after stabilisation	%	10%
			PLF(Stabilization for 6 months)	%	60%
			PLF(during first year after Stabilization)	%	70%
			PLF(second year onwards)	%	80%
			Useful Life	Years	20
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	471.31
3	Financial Assumptions	Debt: Equity	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	329.92
			Total Equity Amount	Rs Lacs	141.39
		Debt Component	Loan Amount	Rs Lacs	329.92
			Repayment Period(incld Moratorium)	years	10
			Interest Rate	%	12.87%
		Equity Component	Equity amount	Rs Lacs	141.39
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10.00
			Return on Equity after 10 years		24.00%
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	32.45%
			MAT Rate (for first 10 years)	%	20.008%
		Depreciation	Depreciation Rate(power plant)	%	7.00%
			Depreciation Rate 11th year onwards	%	2.00%
			Years for 7% depreciation rate		10.00
5	Working Capital	For Fixed Charges	O&M Charges	Months	1
			Maintenance Spare	(% of O&M exepenses)	15%
		For Variable Charges	Receivables for Debtors	Months	2
			Biomass Stock	Months	4
		Interest On Working Capital		%	13.37%
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	3800
		Biomass	Base Price(FY13-14)	Rs/T	3160
			GCV - Biomass	Kcal/kg	3611
7	Operation & Maintenance	power plant (FY 2013-14)		Rs Lakh	25.30
			Total O & M Expenses Escalation	%	5.72%

2.2 Form Template for (Biomass Power Projects) : Determination of Tariff Component																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		5.69	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
Auxiliary Consumption	MU		0.57	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Net Generation	MU		5.12	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		189.41	233.11	233.11	233.11	233.11	233.11	233.11	233.11	233.11	233.11	233.11	233.11	233.11	233.11	233.11	233.11	233.11	233.11	233.11	233.11
Per unit Var Cost	Rs/kWh		3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		25.30	26.75	28.27	29.89	31.60	33.41	35.32	37.34	39.48	41.74	44.12	46.65	49.31	52.14	55.12	58.27	61.60	65.13	68.85	72.79
Depreciation	Rs Lakh		32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99	32.99
Interest on term loan	Rs Lakh		40.35	36.10	31.85	27.60	23.36	19.11	14.86	10.62	6.37	2.12	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		16.62	19.59	19.58	19.57	19.57	19.57	19.58	19.59	19.61	19.64	19.34	19.48	19.63	19.78	19.95	20.12	20.30	20.49	20.70	20.91
Return on Equity	Rs Lakh		26.86	26.86	26.86	26.86	26.86	26.86	26.86	26.86	26.86	26.86	33.93	33.93	33.93	33.93	33.93	33.93	33.93	33.93	33.93	33.93
Total Fixed Cost	Rs Lakh		142.12	142.29	139.56	136.93	134.38	131.95	129.62	127.41	125.32	123.35	120.83	119.49	117.30	115.28	113.42	121.75	125.26	128.98	132.91	137.06
Per unit Fixed Cost	Rs/kWh		2.77	2.26	2.21	2.17	2.13	2.09	2.06	2.02	1.99	1.96	1.69	1.74	1.78	1.83	1.88	1.93	1.99	2.04	2.11	2.17
Levallised tariff corresponding to Useful life																						
Per Unit Cost of Generation	Unit	Levellised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
O&M expn	Rs/kWh	0.57	0.49	0.42	0.45	0.47	0.50	0.53	0.56	0.59	0.63	0.66	0.70	0.74	0.78	0.83	0.87	0.92	0.98	1.03	1.09	1.15
Depreciation	Rs/kWh	0.47	0.64	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Int. on term loan	Rs/kWh	0.36	0.79	0.57	0.51	0.44	0.37	0.30	0.24	0.17	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.31	0.32	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.32	0.32	0.32	0.32	0.33	0.33
RoE	Rs/kWh	0.46	0.52	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Total COG	Rs/kWh	5.87	6.47	5.95	5.91	5.87	5.83	5.79	5.75	5.72	5.68	5.65	5.39	5.43	5.48	5.52	5.57	5.63	5.68	5.74	5.80	5.87
Levellised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.866	0.750	0.650	0.563	0.487	0.422	0.366	0.317	0.274	0.237	0.206	0.178	0.154	0.134	0.116	0.100	0.087	0.075	0.065
Variable Cost			189.6	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4	233.4
Fixed Cost			111.2	136.9	136.9	136.9	136.9	136.9	136.9	136.9	136.9	136.9	136.9	136.9	136.9	136.9	136.9	136.9	136.9	136.9	136.9	136.9
Levellised Tariff (Variable)			3.70																			
Levellised Tariff (Fixed)			2.17																			
Levellised Tariff (Rs/Unit)			5.87																			

Determination of Accelerated Depreciation for Biomass Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	20.008%
Income Tax (Normal Rates)	32.45%
Capital Cost	471.3

Years	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	12.44	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	24.89	13.57	0.00	0.00

Accelerated Depreciation																				
Opening	%	100%	50%	10%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	50%	40.00%	8.00%	1.60%	0.32%	0.06%	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%
Closing	%	50%	10%	2.00%	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%
Accelerated Depn.	Rs Lakh	235.66	188.53	37.71	7.54	1.51	0.30	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	223.21	163.64	12.82	-17.34	-23.38	-24.58	-24.83	-24.87	-24.88	-24.89	-24.89	-24.89	-24.89	-24.89	-24.89	-24.89	-13.57	0.00	0.00
Tax Benefit	Rs Lakh	72.42	53.09	4.16	-5.63	-7.58	-7.98	-8.05	-8.07	-8.07	-8.07	-8.07	-8.07	-8.07	-8.07	-8.07	-8.07	-4.40	0.00	0.00
Net Energy generation	MU	2.56	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	2.83	0.84	0.07	-0.09	-0.12	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.07	0.00	0.00
Discounting Factor		1.00	0.93	0.81	0.70	0.60	0.52	0.45	0.39	0.34	0.29	0.26	0.22	0.19	0.17	0.14	0.12	0.09	0.08	0.07

Tax Benefit Levellised 12.05

Electricity Generation (Levellised) 5.81

Levellised benefit	0.21 (Rs/kWh)
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Annexure – 5 (Cogen Power Projects)

2.1 Form Template for Cogen Power Projects

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity Auxillary Consumption during stabilisation Auxillary Consumption after stabilisation PLF(Stablization for 6 months) PLF(during first year after Stablization) PLF(second year onwards) Useful Life	MW % % % % % Years	1 8.5% 8.5% 60% 60% 60% 20
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	466.08
3	Financial Assumptions	Debt: Equity Debt Component Equity Component	Debt Equity Total Debt Amount Total Equity Amout Loan Amount Repayment Period(incld Moratorium) Interest Rate Equity amount Return on Equity for first 10 years RoE Period Return on Equity after 10 years Discount Rate (equiv. to WACC)	% % Rs Lacs Rs Lacs Rs Lacs years % Rs Lacs % p.a Year % %	70% 30% 326.26 139.82 326.26 10 12.87% 139.82 19.00% 10.00 24.00% 15.46%
4	Financial Assumptions	Fiscal Assumptions Depreciation	Income Tax MAT Rate (for first 10 years) Depreciation Rate(power plant) Depreciation Rate 11th year onwards Years for 7% depreciation rate	% % % % %	32.45% 20.008% 7.00% 2.00% 10.00
5	Working Capital	For Fixed Charges O&M Charges Maintenance Spare Receivables for Debtors For Variable Charges Biomass Stock Interest On Working Capital	(% of O&M exepenses)	Months Months Months %	1 15% 2 4 13.37%
6	Fuel Related Assumptions	Heat Rate Biomass	After Stabilisation period Base Price - Bagasse (FY13-14) GCV - Bagasse	Kcal/kwh Rs/T Kcal/kg	3600 1963 2250
7	Operation & Maintenance	power plant (FY 2013-14) Total O & M Expenses Escalation		Rs Lakh %	16.67 5.72%

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

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

Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08	165.08

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		16.67	17.63	18.63	19.70	20.83	22.02	23.28	24.61	26.02	27.51	29.08	30.74	32.50	34.36	36.32	38.40	40.60	42.92	45.38	47.97
Depreciation	Rs Lakh		32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63	32.63
Interest on term loan	Rs Lakh		39.90	35.70	31.50	27.30	23.10	18.90	14.70	10.50	6.30	2.10	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		14.46	14.42	14.38	14.34	14.30	14.27	14.25	14.22	14.21	14.19	13.86	13.95	14.04	14.15	14.25	14.37	14.49	14.61	14.75	14.89
Return on Equity	Rs Lakh		26.57	26.57	26.57	26.57	26.57	26.57	26.57	26.57	26.57	26.57	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.56	33.56
Total Fixed Cost	Rs Lakh		130.22	126.93	123.70	120.53	117.42	114.38	111.42	108.53	105.71	102.99	85.82	87.57	89.42	91.39	93.46	95.65	97.97	100.42	103.00	105.74

Levelling tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43
O&M expn	Rs/kWh	0.48	0.37	0.39	0.41	0.43	0.46	0.48	0.51	0.54	0.57	0.60	0.64	0.68	0.71	0.76	0.80	0.84	0.89	0.94	1.00
Depreciation	Rs/kWh	0.59	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Int. on term loan	Rs/kWh	0.43	0.74	0.65	0.57	0.48	0.39	0.31	0.22	0.13	0.04	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	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.29	0.29	0.29	0.29	0.30	0.30	0.30	0.30	0.31	0.31
RoE	Rs/kWh	0.58	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Total COG	Rs/kWh	5.81	6.14	6.07	6.00	5.94	5.87	5.81	5.75	5.69	5.63	5.57	5.52	5.25	5.33	5.38	5.42	5.47	5.52	5.57	5.63

Levelling Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.866	0.750	0.650	0.563	0.487	0.422	0.366	0.317	0.274	0.237	0.206	0.178	0.154	0.134	0.116	0.100	0.087	0.075	0.065

Levelling Tariff (Variable)	3.43
Levelling Tariff (Fixed)	2.38
Levelling Tariff (Rs/Unit)	5.81

Determination of Accelerated Depreciation for Cogen and Bagasse based Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	20.008%
Income Tax (Normal Rates)	32.45%
Capital Cost	466.1

Years	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	12.30	24.61	24.61	24.61	24.61	24.61	24.61	24.61	24.61	24.61	24.61	24.61	24.61	24.61	24.61	24.61	13.42	0.00	0.00

Accelerated Depreciation

Opening	%	100%	50%	10%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	50%	40.00%	8.00%	1.60%	0.32%	0.06%	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%
Closing	%	50%	10%	2.00%	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%
Accelerated Depn.	Rs Lakh	233.04	186.43	37.29	7.46	1.49	0.30	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	220.74	161.82	12.68	-17.15	-23.12	-24.31	-24.55	-24.60	-24.61	-24.61	-24.61	-24.61	-24.61	-24.61	-24.61	-24.61	-13.42	0.00	0.00
Tax Benefit	Rs Lakh	71.62	52.50	4.11	-5.56	-7.50	-7.89	-7.97	-7.98	-7.98	-7.98	-7.98	-7.98	-7.98	-7.98	-7.98	-7.98	-4.36	0.00	0.00
Net Energy generation	MU	2.40	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81
Discounting Factor		1.00	0.93	0.81	0.70	0.60	0.52	0.45	0.39	0.34	0.29	0.26	0.22	0.19	0.17	0.14	0.12	0.09	0.08	0.07

Levellised benefit	0.27	(Rs/kWh)
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Annexure – 6A (Solar PV)

Form 1.1 Assumptions Parameters

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%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	800.00
3	Sources of Fund	<u>Debt: Equity</u>	Tariff Period	Years	25
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	560.00
			Total Equity Amount	Rs Lacs	240.00
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	560.00
			Repayment Period(incl Moratorium)	years	10
			Interest Rate	%	12.87%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	240.00
			Return on Equity for first 10 years	% p.a	19.00%
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	32.445%
			MAT Rate (for first 10 years)	%	20.008%
			<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)	15.00%
			Receivables for Debtors	Months	2
			Interest On Working Capital	%	13.37%
6	Operation & Maintenance	<u>power plant (FY13-14)</u>			
			<u>Total O & M Expenses Escalation</u>	Rs Lakh %	11.23 5.72%

Form 1.2 Form Template for (Solar PV Projects) : Determination of Tariff Component																											
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		11.23	11.87	12.55	13.27	14.03	14.83	15.68	16.58	17.52	18.53	19.59	20.71	21.89	23.14	24.47	25.87	27.35	28.91	30.56	32.31	34.16	36.11	38.18	40.36	42.67
Depreciation	Rs Lakh		56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	
Interest on term loan	Rs Lakh		68.48	61.27	54.06	46.86	39.65	32.44	25.23	18.02	10.81	3.60	0.00	0.00	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		4.49	4.36	4.24	4.11	3.99	3.87	3.75	3.63	3.52	3.41	2.63	2.69	2.75	2.82	2.89	2.97	3.05	3.14	3.23	3.32	3.43	3.53	3.65	3.76	3.89
Return on Equity	Rs Lakh		45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	45.60	
Total Fixed Cost	Rs Lakh		185.80	179.11	172.45	165.84	159.26	152.74	146.26	139.83	133.46	127.14	90.48	91.66	92.91	94.23	95.63	97.10	98.66	100.31	102.06	103.90	105.85	107.91	110.09	112.40	114.83
Per unit Fixed Cost	Rs/KWh	8.98	11.16	10.76	10.36	9.96	9.57	9.18	8.79	8.40	8.02	7.64	5.44	5.51	5.58	5.66	5.75	5.83	5.93	6.03	6.13	6.24	6.36	6.48	6.61	6.75	6.90
Levallisied tariff corresponding to Useful life																											
Per Unit Cost of Generation	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/K/Wh	0.98	0.67	0.71	0.75	0.80	0.84	0.89	0.94	1.00	1.05	1.11	1.18	1.24	1.32	1.39	1.47	1.55	1.64	1.74	1.84	1.94	2.05	2.17	2.29	2.43	2.56
Depreciation	Rs/K/Wh	2.78	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	
Int. on term loan	Rs/K/Wh	2.10	4.11	3.68	3.25	2.82	2.38	1.95	1.52	1.08	0.65	0.22	0.00	0.00	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/K/Wh	0.23	0.27	0.26	0.25	0.25	0.24	0.23	0.23	0.22	0.21	0.20	0.16	0.16	0.17	0.17	0.17	0.18	0.18	0.19	0.19	0.20	0.21	0.21	0.22	0.23	
RoE	Rs/K/Wh	2.89	2.74	2.74	2.74	2.74	2.74	2.74	2.74	2.74	2.74	2.74	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.46	3.46	
Total COG	Rs/K/Wh	8.98	11.16	10.76	10.36	9.96	9.57	9.18	8.79	8.40	8.02	7.64	5.44	5.51	5.58	5.66	5.75	5.83	5.93	6.03	6.13	6.24	6.36	6.48	6.61	6.75	6.90
Discount Factor			1	0.86	0.75	0.65	0.56	0.48	0.42	0.36	0.31	0.27	0.23	0.20	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	0.05	0.05	0.04	0.04	
Fixed Cost	8.98		149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	149.49	
Levallisied Tariff	8.98	Rs/Unit																									

Determination of Additional Depreciation for Solar PV Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	20.008%
Income Tax (Normal Rates)	32.445%
Capital Cost	800.00

Years	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%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	21.12	42.24	42.24	42.24	42.24	42.24	42.24	42.24	42.24	42.24	42.24	42.24	42.24	42.24	42.24	42.24	23.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100%	50%	5%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	50.00%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50.0%	5.0%	1.0%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Depn.	Rs Lakh	400.00	360.00	32.00	6.40	1.28	0.25	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	378.88	317.76	-10.24	-35.84	-40.96	-41.98	-42.19	-42.23	-42.24	-42.24	-42.24	-42.24	-42.24	-42.24	-42.24	-42.24	-23.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	122.93	103.10	-3.32	-11.63	-13.29	-13.62	-13.69	-13.70	-13.70	-13.70	-13.70	-13.70	-13.70	-13.70	-13.70	-13.70	-7.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	0.83	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Per unit benefit	Rs/Unit	14.77	6.19	-0.20	-0.70	-0.80	-0.82	-0.82	-0.82	-0.82	-0.82	-0.82	-0.82	-0.82	-0.82	-0.82	-0.82	-0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.86	0.75	0.65	0.56	0.48	0.42	0.36	0.31	0.27	0.23	0.20	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	0.05	0.04	0.04	0.03
Applicable Discounting Factor		1.00	0.93	0.80	0.70	0.60	0.52	0.45	0.39	0.34	0.29	0.25	0.22	0.19	0.16	0.14	0.12	0.11	0.09	0.08	0.07	0.06	0.05	0.04	0.03

Levelised benefit	1.30	Rs/Unit
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Annexure – 6B
(Solar thermal)

Form 1.1 Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	23%
			Deration Factor	%	10%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	1200.00
3	Sources of Fund		Tariff Period	Years	25
		<u>Debt: Equity</u>	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	840.00
			Total Equity Amount	Rs Lacs	360.00
		<u>Debt Component</u>	Loan Amount	Rs Lacs	840.00
			Repayment Period(incl'd Moratorium)	years	10
			Interest Rate	%	12.87%
		<u>Equity Component</u>	Equity amount	Rs Lacs	360.00
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10
			Return on Equity 11th year onwards	% p.a	24.00%
			Weighted average of ROE		22.00%
			Discount Rate		15.61%
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	32.445%
			MAT Rate (for first 10 years)	%	20.008%
			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)		15.00%
		Receivables for Debtors		Months	2
		Interest On Working Capital		%	13.37%
6	Operation & Maintenance				
		power plant (FY13-14)		Rs Lakh	16.24
		<u>Total O & M Expenses Escalation</u>		%	5.72%

Form 1.2 Form Template for (Solar Thermal projects) : Determination of Tariff Component																											
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		16.24	17.17	18.15	19.19	20.29	21.45	22.67	23.97	25.34	26.79	28.32	29.94	31.66	33.47	35.38	37.41	39.55	41.81	44.20	46.73	49.40	52.23	55.21	58.37	61.71
Depreciation	Rs Lakh		84.00	84.00	84.00	84.00	84.00	84.00	84.00	84.00	84.00	84.00	84.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
Interest on term loan	Rs Lakh		102.72	91.91	81.10	70.28	59.47	48.66	37.85	27.03	16.22	5.41	0.00	0.00	0.00	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		6.70	6.51	6.32	6.13	5.94	5.76	5.58	5.40	5.23	5.06	3.88	3.97	4.07	4.17	4.27	4.38	4.50	4.62	4.75	4.89	5.04	5.19	5.35	5.53	5.71
Return on Equity	Rs Lakh		68.40	68.40	68.40	68.40	68.40	68.40	68.40	68.40	68.40	68.40	68.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40
Total Fixed Cost	Rs Lakh		278.07	267.99	257.96	248.00	238.10	228.26	218.50	208.81	199.19	189.66	134.61	136.32	138.12	140.03	142.05	144.19	146.44	148.83	151.35	154.02	156.84	159.82	162.97	166.30	169.82
Per unit Fixed Cost	Rs/KWh	12.31	15.33	14.78	14.23	13.68	13.13	12.59	12.05	11.52	10.98	10.46	7.42	7.52	7.62	7.72	7.83	7.95	8.08	8.21	8.35	8.49	8.65	8.81	8.99	9.17	9.37
Levallised tariff corresponding to Useful life																											
Per Unit Cost of Generation	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/KWh	1.30	0.90	0.95	1.00	1.06	1.12	1.18	1.25	1.32	1.40	1.48	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	3.22	3.40
Depreciation	Rs/KWh	3.83	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	4.63	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Int. on term loan	Rs/KWh	2.89	5.66	5.07	4.47	3.88	3.28	2.68	2.09	1.49	0.89	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/KWh	0.31	0.37	0.36	0.35	0.34	0.33	0.32	0.31	0.30	0.29	0.28	0.21	0.22	0.22	0.23	0.24	0.24	0.25	0.25	0.26	0.27	0.28	0.29	0.30	0.30	0.31
RoE	Rs/KWh	3.98	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76
Total COG	Rs/KWh	12.31	15.33	14.78	14.23	13.68	13.13	12.59	12.05	11.52	10.98	10.46	7.42	7.52	7.62	7.72	7.83	7.95	8.08	8.21	8.35	8.49	8.65	8.81	8.99	9.17	9.37
Discount Factor			1	0.86	0.75	0.65	0.56	0.48	0.42	0.36	0.31	0.27	0.23	0.20	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03
Fixed Cost	12.31		223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31	223.31
Levallised Tariff	12.31	Rs/Unit																									

Determination of Additional Depreciation for Solar Thermal Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20%
Income Tax (MAT)	20.008%
Income Tax (Normal Rates)	32.445%
Capital Cost	1200.00

Years	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	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	34.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation																										
Opening	%	100%	50%	5%	1%	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	%	50.00%	45.00%	4.00%	0.80%	0.16%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	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	%	50.0%	5.0%	1.0%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Depm.	Rs Lakh	600.00	540.00	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

Net Depreciation Benefit	Rs Lakh	568.32	476.64	-15.36	-53.76	-61.44	-62.98	-63.28	-63.34	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-34.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	184.39	154.65	-4.98	-17.44	-19.93	-20.43	-20.53	-20.55	-20.56	-20.56	-20.56	-20.56	-20.56	-20.56	-20.56	-20.56	-11.21	0.00	0.00	0.00	0.00	0.00	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	2.01	2.01	2.01	2.01
Per unit benefit	Rs/Unit	18.30	7.68	-0.25	-0.87	-0.99	-1.01	-1.02	-1.02	-1.02	-1.02	-1.02	-1.02	-1.02	-1.02	-1.02	-1.02	-0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.86	0.75	0.65	0.56	0.48	0.42	0.36	0.31	0.27	0.23	0.20	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	0.05	0.04	0.04	0.03
Applicable Discounting Factor		1.00	0.93	0.80	0.70	0.60	0.52	0.45	0.39	0.34	0.29	0.25	0.22	0.19	0.16	0.14	0.12	0.11	0.09	0.08	0.07	0.06	0.05	0.04	0.03

Levelised benefit	1.62	Rs/Unit
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