

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
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Case No 20 of 2010

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

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

ORDER (SUO-MOTU)

Dated: July 14, 2010

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

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



2. The RE Tariff Regulations require the Commission to suo-motu determine the Generic Tariff for the RE technologies for which norms have been specified in the said Regulations.

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

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

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

In accordance with the above Regulations, the Commission, vide its public notice dated June 21, 2010, issued a Draft 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, and invited comments from various stakeholders. The Commission received written suggestions and objections from various persons.

After considering suggestions and objections as received, the Commission, in due discharge of the mandate under Regulation 8.1 of RE Tariff Regulations, proceeds to determine the generic tariff of the RE projects for the first year of the Control Period (i.e., FY 2010-11) through this Order based on the financial principles and technology specific parameters as explained in the subsequent sections of the Order. The tariff as determined in this Order is in accordance with the specifications and norms specified in the RE Tariff Regulations.

A public hearing was held on **Saturday, July 10, 2010, at Sunderbai Hall, 5th Floor, Shri Nathibai Thakersey Road, off Maharshi Karve Road, Churchgate, Mumbai 400020**. 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**.

1. Comments/Objections received and Commission's ruling

1.1. CAPITAL COST OF WIND PROJECTS

Stakeholder Comments/Suggestions

Few Stakeholders submitted that the capital cost of Rs 467 Lakh/MW considered for determination of tariff for wind power projects is on the lower side. While Indian Wind Turbine Manufacturers Association (IWTMA) and Rashtriya Chemicals and Fertilisers Ltd (RCF) submitted that a capital cost of Rs. 525 Lakh/MW may be considered for determining tariff, the Indian Wind Energy Association (InWEA) suggested revision of the proposed capital cost of Rs 467 Lakh/MW in light of the fact that increase in the cost of Steel and Cement has resulted in increase of the project cost. Further, the Indian Renewable Energy Development Agency (IREDA) submitted that a capital cost of Rs 500 Lakh/MW to Rs 680 Lakh/MW may be considered, and Acciona Energy submitted that a capital cost of Rs 550 Lakh/MW may be considered for tariff determination of wind energy projects for FY 2010-11.

Commission's Ruling

As regards Capital Cost for Wind Power Projects for FY 2010-11, the Commission has specified in Regulation 25.1 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 that the same shall be based on the issuance of such indexed capital cost for wind energy projects by CERC, which is also in accordance with indexation mechanism stipulated under CERC RE Tariff Regulations. The Commission further notes that the key project cost determining factors such as Iron & Steel and Electrical & Machinery costs have followed downward trend with respect to the previous year, which has resulted in the capital cost norm specified for FY 2010-11. Moreover, the Commission also observes that Gujarat Electricity Regulatory Commission under its Order No 1 of 2010 dated January 30, 2010 has considered capital cost for wind energy projects as Rs 462 Lakh per MW, Andhra Pradesh Electricity Regulatory Commission in



its Order O.P No. 7 of 2009 dated May 1, 2009 has considered normative capital cost as Rs 470 Lakh per MW and Karnataka Electricity Regulatory Commission in its Order dated December 11, 2009 has also considered normative capital cost of Rs 470 Lakh per MW. Moreover, the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 have been notified after considering various relevant materials, information and data and after undertaking the required regulatory process of prior publication, invitation of comments, etc. As such, the norms specified in the Regulations require observance of sanctity and should not be modified on case to case basis. .

1.2. O&M EXPENSES OF WIND PROJECTS

Stakeholder Comments/Suggestions

RCF submitted that the proposed O&M cost of Rs 6.87 Lakh/MW is on the lower side and O&M cost of Rs. 10 Lakh/MW may be considered for the first year with an annual escalation of 6%.

Acciona Energy India Pvt. Ltd. submitted that O&M cost of 2% of the capital cost with a yearly escalation of 5.72% may be considered for wind energy projects.

Commission's Ruling

As regards O&M Expenses for wind power projects, Regulation 27 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides for normative O&M expenses as Rs 6.87 Lakh/MW for the first year of the Control Period (FY 2010-11) with escalation factor of 5.72% per annum. Accordingly, the same has been considered while determining the generic tariff for the plants to be commissioned during FY 2010-11. Moreover, the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 have been notified after undertaking the required regulatory process of prior publication, invitation of comments, etc. As such, the norms specified in the Regulations require observance of sanctity and should not be modified on case to case basis.

1.3. MINIMUM ALTERNATE TAX

Stakeholder Comments/Suggestions

RCF and Welspun Renewable Energy Ltd submitted that the MAT rate of 19.93% may be considered for determination of tariff.



Commission's Ruling

The MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides for normative return on equity in pre-tax terms. Accordingly, any gains or losses on account of any change in tax rate, MAT or Corporate Tax, as the case may be, shall be to the account of the renewable energy project developer since the returns have been specified in pre-tax terms. Besides, the Commission observes that MAT rate or change thereof has no bearing on the present tariff determination exercise. Moreover, the MERC (Terms and Conditions for determination of 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 should not be modified through this Order.

1.4. LINE LOSSES TILL INTERCONNECTION POINT FOR WIND PROJECT

Stakeholder Comments/Suggestions

RCF and CLP Windfarms (India) Pvt Ltd (CLP) submitted that line losses and transformation losses to wheel the electricity from generator level to the inter-connection point may be taken into account while determining tariff.

Commission's Ruling

The 'interconnection point' has been clearly defined under Regulation 2.1(p) of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010. The generic norms for capital cost, performance parameters, etc., have been stipulated taking into consideration this aspect. Thus, any internal line losses/transformation losses up to interconnection point are to the account of RE generator. Thus, the Commission does not consider it necessary to factor in any additional line losses/transformation losses for determination of tariff.

1.5. CONTROL PERIOD AND TARIFF PERIOD FOR WIND PROJECT

Stakeholder Comments/Suggestions



InWEA submitted that Para 1.1 of the Draft Order may be modified to rightly represent the Control Period (FY 2010-11 to FY 2015-16) as per the MERC RE Tariff Regulations, 2010.

RCF submitted that there should be provision of periodic review of Tariff and also Tariff beyond 13 years should be determined for wind projects. Acciona submitted that a tariff period of 25 years instead of the proposed 13 years may be considered for wind energy projects.

Commission's Ruling

The Commission has noted the observation of InWEA and necessary changes have been incorporated in this final Tariff Order.

As regards revision of Control Period and Tariff Period, Regulation 5 and Regulation 6 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies the Control Period and the Tariff Period of RE projects. Accordingly the Commission has considered a Control Period of five years and a Tariff Period of 13 years for wind power projects.

1.6. LINKING TARIFF TO INDEXATION MECHANISM

Stakeholder Comments/Suggestions

Acciona Energy submitted that the tariff for wind projects should be fixed for the entire Control Period and should not be linked to any indexation mechanism.

Commission's Ruling

Regulation 25 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies that the capital cost of wind energy projects for each year of the Control Period shall be notified pursuant to the issuance of indexed capital cost for wind energy projects by CERC in accordance with the indexation mechanism stipulated under CERC RE Tariff Regulations. Thus, Tariff for each year of the Control Period is subject to changes in the indexed Capital Cost of wind projects for that particular year. However, the Commission clarifies that Tariff determined for a particular year shall continue to be applicable for the entire duration of the Tariff Period as per Regulation 6.5 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010.



1.7. CUF OF WIND POWER PROJECTS

Stakeholder Comments/Suggestions

Shri Dwaraknath V Iyer, a power plant consulting engineer, submitted that the CUF figures for various wind zones as proposed are not being achieved in many wind projects in Maharashtra. He suggested that a reduction of 2% in CUF may be considered across the board from Zone-1 to Zone 4. IWTMA submitted that as per C-WET WPD map, there is no Class 4 WPD site available in the State of Maharashtra, hence, Zone-4 classification may be removed and CUF for other wind zones may be re-classified.

Commission's Ruling

In this Tariff Order, Capacity Utilisation Factor (CUF) for wind projects has been considered based on the CUF norms specified in Regulation 26.1 of MERC (Terms and Conditions for determination of RE tariff) Regulations, 2010. As regards IWTMA submission for modification/reclassification of wind zones, the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 have been notified after undertaking the required regulatory process of prior publication, invitation of comments, etc., and as such, the norms specified in the Regulations require observance of sanctity and should not be modified on case to case basis.

1.8. USEFUL LIFE OF WIND POWER PROJECTS

Stakeholder Comments/Suggestions

InWEA submitted that project life of 20 years instead of 25 years may be considered for determination of tariff for wind projects. InWEA added that the life of WTG is 20 years as per the Provisional Type Certification Scheme for Wind Turbine in India as amended in April 2003 by Ministry of New and Renewable Energy (MNRE) and which is presently being considered by C-WET for Type certification of WTGs. Further, InWEA submitted that all the wind turbine manufacturers are claiming the designed life of WTG as 20 years in their product catalogue.

Commission's Ruling

Regulation 2.1 (ff) of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies useful life of 25 years for wind power projects. Accordingly,



the Commission has considered the same in determination of tariff for wind projects in FY 2010-11.

1.9. OPERATIONALISING ZONE WISE TARIFF FOR WIND POWER PROJECTS

Stakeholder Comments/Suggestions

InWEA submitted that under the proposed new practice of zone wise tariff, the certification of sites based on the Wind Power Density and the subsequent certification of the actual projects commissioned in a particular site may result in delays at least in the initial period. Hence, InWEA requested the Commission to issue directives to the concerned agencies for devising modus operandi for faster signing of PPAs based on the WPD Certification.

Acciona Energy and CLP submitted that WPD zone of a wind project needs to be certified by C-WET so as to be considered as reference for considering the tariff applicable for projects.

The Maharashtra State Electricity Distribution Company Limited (MSEDCL) submitted that MEDA/State Agency may be directed to specify the list of locations in the Maharashtra State and the respective Wind Zone/Annual Mean Wind Power Density (W/m^2), so that proper regulated tariff can be applied to them.

Commission's Ruling

Regulation 26.3 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies that the State-wise wind power density map prepared by Centre for Wind Energy Technology (C-WET) shall form the basis of classification of wind energy project into particular wind zone class. **In view of operational concerns expressed by the Wind Energy developers and MSEDCL, the Commission directs Maharashtra Energy Development Agency (“MEDA”) to devise suitable procedures for operationalising the same in consultation with C-WET/Wind Energy developers and distribution licensees within two months from issuance of this Order and also publish such information on its website on regular basis.**



1.10. CAPITAL COST OF SOLAR PV POWER PROJECTS

Stakeholder Comments/Suggestions

Shri Dwaraknath V Iyer submitted that though capital cost of Solar PV Projects is proposed as Rs. 1690 Lakh/MW for FY 2010-11, there is still some ambiguity about the power evacuation scheme, interconnection point, etc.

Welspun Renewable Energy Ltd submitted that capital cost of Solar PV projects were determined by CERC for FY 2010-11 on the basis of the then prevalent module prices and exchange rate of USD and hence, consider the latest USD exchange rate to adjust the capital cost accordingly.

Commission's Ruling

The 'interconnection point' has been clearly defined under Regulation 2.1(p) of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 and the grid connectivity framework/evacuation arrangement has also been specified under Regulation 17.1 of MERC (Renewable Purchase Obligation, its compliance and REC Framework Implementation) Regulations, 2010. Further, Regulation 12.1 and Regulation 65 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies the premise for normative capital cost for setting up Solar PV Power Project as 1690 Lakh/MW for FY 2010-11.

1.11. O&M COST NORMS FOR SOLAR PV POWER PROJECTS

Stakeholder Comments/Suggestions

Welspun Renewable Energy Ltd submitted that an O&M cost of 10.05 Lakhs/MW may be considered for FY 2010-11 instead of the proposed 9.51 Lakhs/MW.

Acciona Energy submitted that O&M cost of Rs. 13 Lakh/MW may be considered for FY 2010-11.

Commission's Ruling

Regulation 67 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies the normative O&M cost for Solar PV Power Project as 9.51



Lakh/MW for FY 2010-11, which has been considered in the suo-motu Order for determination of tariff.

1.12. CUF OF SOLAR PV POWER PROJECTS

Stakeholder Comments/Suggestions

Shri Dwaraknath V Iyer submitted that a CUF of 17% is more realistic and the same may be adopted instead of the proposed CUF of 19%. Further, considering the lighting loads, air-conditioning loads, Inverter and Transformer Losses at the power plant, an auxiliary consumption of 2% may be considered.

Welspun Renewable Energy Ltd submitted that different CUFs should be considered for Solar PV projects in different regions of the State based on Solar Radiation levels.

Commission's Ruling

Regulation 66 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies a CUF of 19% for Solar PV projects, which has been considered in the suo-motu Order.

1.13. CONTROL PERIOD FOR SOLAR PV POWER PROJECTS AND SOLAR THERMAL POWER PROJECTS

Stakeholder Comments/Suggestions

Welspun Renewable Energy Ltd submitted that the tariff applicability of Solar PV projects may be extended till the end of FY 2012-13, instead of till the end of FY 2011-12 as proposed, since it is envisaged that Solar PV projects in Maharashtra may get commissioned only in FY 2011-12.

The Maharashtra State Power Generation Company Limited (MSPGCL) submitted that the provision related to project commissioning duration should be extended to March 31, 2013 in respect of Solar PV projects and on or before March 31, 2014 in respect of Solar thermal projects, considering the manufacturing and supply constraints of grid connected Solar technology in India.

Commission's Ruling



Regulation 5.2 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies that the tariff determined for Solar PV projects during FY 2010-11 shall also be applicable for such projects during FY 2011-12 and tariff determined for Solar thermal projects during FY 2010-11 shall also be applicable for such projects during FY 2011-12 and FY 2012-13 subject to certain conditions outlined under said Regulations. Further, the proviso to Regulation 5.2 also specifies the project commissioning duration of Solar PV and Solar thermal projects. The aforesaid Regulation along with the said proviso was incorporated in the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 by the Commission upon due regulatory consultation process. The Commission observes that solar power development is at nascent stage in India and capital cost norms are still evolving with changing market dynamics. The operational performance norms are yet to be ascertained based on ground realities in Indian conditions. Thus, stipulating the tariff or norms for extended period would not be appropriate unless experience of few projects is gathered.

1.14. CAPITAL COST OF SOLAR THERMAL POWER PROJECTS

Stakeholder Comments/Suggestions

Acciona Energy submitted that Capital Cost of Rs 1797 Lakh/MW may be considered for tariff determination for Solar thermal power projects.

Commission's Ruling

Regulation 70 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies the normative capital cost for setting up Solar thermal power project as 1530 Lakh/MW for FY 2010-11, which has been considered in the suo-motu Order for determination of tariff.

1.15. O&M COST AND CUF FOR SOLAR THERMAL POWER PROJECTS

Stakeholder Comments/Suggestions

Acciona Energy submitted that, compared to the direct normal irradiance (DNI) data available for Maharashtra, CUF considered in the Draft Order is on the higher side and hence, a CUF of not more than 12% may be considered for determination of tariff for solar thermal projects. Further, O&M cost of Rs. 23 Lakh/MW may be considered.



Commission's Ruling

Regulation 72 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies the normative CUF for Solar thermal projects as 23%. Further, Regulation 73 of the said Regulations specifies a normative O&M cost of 13.74 Lakh/MW for first year of operation, which have been considered in the suo-motu Order for determination of tariff.

1.16. GRID CONNECTIVITY OF SOLAR POWER PROJECTS

Stakeholder Comments/Suggestions

Few stakeholders like Welspun Renewable Energy Ltd, Arbutus Computers & Consultants Pvt Ltd, and MSPGCL submitted that the responsibility for power evacuation infrastructure should lie with the concerned transmission/distribution licensee and the same should not be the responsibility of the project developer.

Commission's Ruling

The Grid Connectivity framework and responsibility of power evacuation has been clearly stipulated under Regulation 17.1 of the MERC (Renewable Purchase Obligation, its Compliance and REC Framework Implementation) Regulations, 2010, which outlines the responsibility for evacuation arrangement with concerned licensee, i.e., distribution licensee or transmission licensee depending upon whether RE project is required to be connected to distribution system or transmission system. Further, the Inter-connection point for Solar PV power projects and for Solar thermal projects has been defined under Regulation 2(1)(p) of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010.

Hence, the Commission rules that the evacuation infrastructure beyond the Inter-connection point is the responsibility of the concerned Transmission Licensee or Distribution Licensee, as the case may be.

1.17. TARIFF FOR TECHNOLOGY OTHER THAN RANKINE CYCLE BASED BIOMASS PROJECTS

Stakeholder Comments/Suggestions



Ankur Scientific Energy Technologies submitted that Biomass-to-energy technologies like Gassification, Anaerobic Fermentation, etc., should be included in the current policy being formulated.

Forbes & Company Limited submitted that since Otto cycle based Biomass projects are more efficient than Rankine cycle based Biomass projects, a tariff of Rs. 5.50 /kWh (which is 10% higher than that provided for Rankine cycle based Biomass projects) may be specified for Otto cycle based Biomass Projects.

Commission's Ruling

The Commission has recognised that biomass power projects based on technology other than rankine cycle also need to be promoted. Accordingly, the Commission has enabled 'project specific tariff determination' for such projects as per Regulation 7.1(f) of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010. The relevant extract of the Regulations is reproduced as under.

“ ...

7. Project Specific Tariff

7.1 Project specific tariff, on case to case basis, shall be determined by the Commission for the following types of projects:

...

f) *Biomass project other than that based on Rankine Cycle technology application with water cooled condenser.*

...”

Accordingly, the Commission shall determine the tariff for Biomass power projects based on technologies other than Rankine cycle on a project specific basis, provided such Petition is filed with requisite supporting information in accordance with the relevant Regulations.

1.18. TAXES AND DUTIES

Stakeholder Comments/Suggestions

CLP submitted that the Commission may clarify the process to be followed by investors for claiming reimbursement of taxes from the Utility, which is already allowed as a pass



through. CLP also requested to consider permitting the projects to submit a certificate from a Chartered Accountant confirming the tax paid by a particular project for the purpose of claiming tax reimbursement in case multiple projects are developed by single entity.

Commission's Ruling

The provision regarding recovery of taxes and duties as may be applicable on generation and sale of electricity is provided in Regulations 23.1 of the MERC (Terms and Conditions of determination of RE Tariff) Regulations, 2010. On the process to be followed, the Parties may mutually discuss and agree on detailed modalities for operationalising the same as a part of Energy/Power Purchase Agreement.

1.19. GRID AVAILABILITY

Stakeholder Comments/Suggestions

CLP submitted that in the wake of wind projects being treated as 'Must Run' Plants, a suitable mechanism may be devised to compensate the project developers in case grid availability goes below 98%.

Commission's Ruling

Regulation 11.1 referred to by CLP is in the context of non-applicability of merit order despatch principles for scheduling and despatch of wind power projects in accordance with the provisions under State Grid Code Regulations. Accordingly, the issue of grid availability is not relevant in the context of Regulation 11.1 and cannot be addressed in a generic way unless factual position in the matter is ascertained on a case to case basis.

1.20. CAPITAL COST OF SMALL HYDRO PROJECTS

Stakeholder Comments/Suggestions

IREDA submitted that the capital cost of Rs 668 Lakh/MW to Rs 681 Lakh/MW may be considered for tariff determination of small hydro power projects. Further, MSEDCL submitted that the capital cost proposed in the Draft Order is on the lower side and the actual capital cost is much more.

Commission's Ruling



Regulation 28 of the MERC (Terms and Conditions of RE Tariff) Regulations, 2010 specifies the normative capital cost for setting up Small Hydro Project in FY 2010-11 as Rs 498.88 Lakh/MW (for >1MW and upto and including 5MW) and Rs 453.53 Lakh/MW (for capacity > 5MW to 25MW). The norms under the Regulations have been specified upon extensive consultation process. Moreover, the MERC (Terms and Conditions for determination of 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 should not be modified through this suo-motu Order.

1.21. TARIFF FOR SMALL HYDRO PROJECTS (SHP)

Stakeholder Comments/Suggestions

MSEDCL submitted that the tariff for existing SHPs connected to MSEDCL network is on the lower side and hence, they would be selling their power through third party sale or through a trader and the same would not be available to MSEDCL to meet its RPO. MSEDCL requested the Commission to determine a separate tariff for existing Small Hydro Projects considering their balance cost, balance period, O&M expenses, availability of water, and other related factors as may be applicable to these projects.

Four Eyes Research (P.) Ltd. submitted that an enhanced tariff of Rs 6.39/kWh for SHP less than 500 kW may be specified considering the higher capital cost of such low capacity hydro projects.

Celerity Power Pvt. Ltd. submitted that the tariff set for SHP is not viable and not attractive and also suggested that procurement of Renewable power at rate other than regulated price should be considered for RPO compliance.

Commission's Ruling

As regards tariff of existing SHPs, Regulation 3.2 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations 2010 specifies that for existing RE projects, applicable tariff and other terms and conditions, shall be governed by respective RE Tariff Orders and amendments thereof as issued from time to time by the Commission. Further, the said Tariff Order for existing SHP was issued by the Commission after due regulatory process for the specified tariff period. The review of said Tariff Order cannot be undertaken as part of present regulatory process.



The Commission has recognised the requirement of higher capital cost and enhanced tariff for SHPs of lower capacity (< 1 MW), while framing the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, which stipulates that “*Tariff for Mini/Micro Hydro Projects shall be higher by Rs 0.50 /kWh or such other higher amount as may be stipulated by the 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.*” Accordingly, the Commission will issue appropriate directions in such cases, if necessary.

1.22. EVACUATION OF POWER FROM MINI AND MICRO HYDRO PROJECTS

Stakeholder Comments/Suggestions

Four Eyes Research (P.) Ltd. submitted that Utilities may be asked to provide grid connectivity at 11/22 kV level for micro hydro projects.

Commission’s Ruling

The Inter-connection point for Mini/Micro/Small Hydro power projects has been defined under Regulation 2.1(p) of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 and the same is reproduced as under:

- “ ...
- (p) *‘Inter-connection Point’ shall mean interface point of renewable energy generating facility with the transmission system or distribution system, as the case may be:*
1. ...
 2. *in relation to mini/micro hydro power, small hydro power, biomass power and non-fossil fuel based co-generation power projects and Solar Thermal Power Projects the, **inter-connection point shall be the line isolator on outgoing feeder on HV side of generator transformer; (emphasis added)***
- ...”



Further, the Grid Connectivity framework and responsibility of power evacuation has been clearly stipulated under Regulation 17.1 of MERC (Renewable Purchase Obligation, its Compliance and REC Framework Implementation) Regulations, 2010, which outlines the responsibility for evacuation arrangement with concerned licensee, i.e., distribution licensee or transmission licensee depending upon whether RE project is required to be connected to distribution system or transmission system, respectively.

1.23. WATER ROYALTY CHARGES FOR SHP PROJECTS

Stakeholder Comments/Suggestions

Dodson Lindblom Hydro Power Private Limited submitted that the Draft Order has not stated about Water Royalty and Maintenance Charges that are required to be paid to the Water Resources Department, Government of Maharashtra. However, as per the earlier SHP Policy and also as per Government of Maharashtra Policy of September 2005, Water Royalty is a pass-through expense.

Commission's Ruling

The Commission clarifies that the water royalty charges imposed by the State Government have not been factored in while determining tariff and the same shall be allowed as 'pass through' as actually incurred.

1.24. TARIFF FOR BIOMASS POWER PROJECTS

Stakeholder Comments/Suggestions

IREDA submitted that the capital cost of Rs 419 Lakh/MW to Rs 465 Lakh/MW may be considered for tariff determination of biomass power projects. MBEDA submitted that the capital cost of Rs 500 Lakh/MW may be considered for determination of tariff for such projects.

MBEDA submitted that SHR of 4125 kcal/kWh, GCV of 3328 kcal/kg and an Auxiliary Consumption of 12% have been arrived at based on the study by National Productivity Council and should be adopted to determine the Variable charge component of tariff for biomass Projects.



MBEDA further submitted that an increment of Rs. 0.46/kWh in the Fixed Charge component may be applied to cater for the increment in fixed cost component of existing Biomass power projects over the years due to the natural inflation in the market towards O&M and other fixed costs such as interest rates, etc.

MBEDA submitted that a minimum sustainable tariff rate of Rs 5.78/kWh (Fixed Charge of 2.16/ kWh {1.70+0.46} +Variable Charge Rs 3.62/kWh{computed based on SHR, GCV and Aux norms mentioned in the NPC report}) may be allowed for the first year of the Control Period, i.e., FY 2010-11.

MSEDCL submitted that fixed component of Tariff for existing Biomass Project goes on decreasing with time, which may be considered while specifying tariff for such projects.

Commission's Ruling

Regulation 35.1 of MERC (Terms and Conditions of determination of RE Tariff) Regulations, 2010, specifies that the capital cost and performance norms as specified under Regulation 36 to Regulation 40 shall be applicable for new biomass power projects only with effect from April 1, 2013.

Further, in accordance with Regulations 3.3 of the aforesaid Regulations, the tariff rate, tariff structure and other conditions as specified under earlier RE Tariff Order shall continue to be applicable for first three years of the Control Period, i.e., FY 2010-11, FY 2011-12 and FY 2012-13.

1.25. APPLICABILITY OF TARIFF FOR EXISTING BIOMASS PROJECTS

Stakeholder Comments/Suggestions

MBEDA submitted that the net tariff rate of Rs 4.28/kWh (Fixed 1.70 + variable 2.58) approved by the Commission in its Order dated March 25, 2009 may be allowed w.e.f. April 1, 2008 and net tariff rate of Rs 4.98/kWh (Fixed 1.70+Variable 3.28) approved by the Commission in its Order dated December 14, 2009 may be allowed w.e.f April 1, 2009 for FY 2009-10, ending on March 31, 2010.

Commission's Ruling

The retrospective review of applicability of earlier Orders (Case No. 83 of 2008), i.e., Order dated March 25, 2009 and Order dated December 14, 2009 is not the subject matter



of present regulatory process, which has been initiated for determination of Tariff based on norms specified under the notified Regulations.

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

Stakeholder Comments/Suggestions

IREDA submitted that the capital cost of Rs 383 Lakh/MW may be considered for non-fossil fuel based cogeneration projects. MSEDCL submitted that the capital cost proposed in the Draft Order is on the lower side and the actual capital cost is much more.

Commission's Ruling

As per Regulation 49.1 of MERC (Terms and Conditions of determination of RE Tariff) Regulations, 2010, the capital cost and performance norms as specified under Regulation 50 to Regulation 54 shall be applicable for new non-fossil fuel based co-generation projects only with effect from April 1, 2013.

Further, in accordance with Regulations 3.3 of the aforesaid Regulations, the tariff rate, tariff structure and other conditions as specified under earlier RE Tariff Order shall continue to be applicable for first three years of the Control Period, i.e., FY 2010-11, FY 2011-12 and FY 2012-13.

1.27. SHARING OF SUBSIDY AND INCENTIVE BENEFITS AND CDM BENEFITS

Stakeholder Comments/Suggestions

MSEDCL submitted that the subsidies that have not been considered while determining the tariff, if materialized in future, should be shared between the licensee and developer equally. MSEDCL also submitted that the CDM benefit should be equally shared between the Host Licensee and Generator.

Commission's Ruling

As per Regulation 22.1 of MERC (Terms and Conditions for determination of 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.



However, the issue raised by MSEDCL pertains to future subsidies if and when materialised for the RE project which were not factored in while determining tariff. The Commission is of the view that in the absence of specific information as regards nature of subsidy, its purpose, eligibility and applicability etc, the Commission is not inclined to pass generic ruling in the matter at this stage. The issue of sharing of such subsidies can be taken up in accordance with the provisions under Regulations based on application to be filed by 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.

1.28. TARIFF FOR EXISTING RE PROJECTS

Stakeholder Comments/Suggestions

MSEDCL submitted that REC mechanism may not be allowed for the old projects whose EPA's/EWA's/ Validity Period have expired, and for such projects Commission may rationalise the tariff.

Commission's Ruling

The eligibility of existing RE projects to participate in the REC mechanism shall be governed by provisions of MERC (Renewable Purchase Obligation, its compliance and REC framework Implementation) Regulations, 2010. Regulation 16 of the said Regulations clearly outlines conditions for eligibility for existing RE projects to participate in the REC mechanism. The review of such conditions is not the subject matter of the present regulatory process, which has been initiated for determination of Tariff based on provisions outlined under the notified Regulations.



2. Common Parameters applicable for determination of Generic Tariff

This section of the Order details the applicable norms for determination of Generic Levellised Tariff, which are common to all type of renewable technologies as specified in the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010.

2.1. CONTROL PERIOD

Regulation 5 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies that the Control Period for determination of tariff for RE projects shall be five years, starting from the date of notification of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010. The Proviso to Regulation 5.1 stipulates that the tariff determined for the RE projects commissioned during the Control Period shall continue to be applicable for the entire duration of the Tariff Period (as specified in Regulation 6 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010).

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

2.2. TARIFF STRUCTURE

Regulation 9.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 stipulates that the tariff for RE projects shall be single part tariff consisting of the following fixed cost components:

- (a) Return on equity;



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

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

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

2.3. TARIFF DESIGN

In accordance with Regulation 10 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the Tariff Design for RE generating stations is as under:

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

...

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

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

2.4. LEVELLISED TARIFF

Levellised Tariff is calculated by carrying out levellisation over useful life of each technology considering the discount factor equivalent to weighted average cost of capital representing time value of money.

Discount Factor



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

Interest Rate considered for the loan component (i.e., 70%) of Capital Cost is 13.37% (as explained later in this Order). For equity component (i.e., 30%) rate of Return on Equity (ROE) for the first ten (10) years is 19%, and for 11th year onwards till useful life of the RE project, the rate is 24%. Based on these rates, the weighted average ROE has been calculated, which is around 22% (ranging from 21.50% to 22.57% depending on useful life of RE technologies). The discount factor for each technology derived by this method is detailed in the respective technology specific sections of this Order.

2.5. SUBSIDY OR INCENTIVE BY THE CENTRAL/STATE GOVERNMENT

Regulation 22 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies:

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

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

- a) Assessment of benefit shall be based on normative capital cost, accelerated depreciation rate as per relevant provisions under Income Tax Act and corporate income tax rate.*
- b) Capitalisation of RE projects during second half of the fiscal year.*
- c) Per unit benefit shall be derived on levellised basis at discount factor equivalent to weighted average cost of capital.”*



Accordingly, for the projects availing the benefit of accelerated depreciation as per applicable Income Tax rate of 33.99% (30% IT rate + 10% surcharge + 3% Education cess) has been considered. For the purpose of determining net depreciation benefits, depreciation @ 5.28% as per straight line method (Book depreciation as per Companies Act, 1956) has been compared with depreciation as per Income Tax rate, i.e., 80% of the written down value method and depreciation for the first year has been calculated at the rate of 50% of 80%, i.e., 40%, assuming the project is capitalized during the second half of the financial year as per proviso (ii) to Regulation 22. Tax benefit has been worked out as per normal tax rate on the net depreciation benefit. Per unit levelled accelerated depreciation benefit has been computed considering the weighted average cost of capital as discounting factor. Detailed computation of benefit of accelerated depreciation in respect of each RE technology has been covered under technology specific sections.

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

2.6. SHARING OF CDM BENEFITS

As per Regulation 21.1 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, all risks, costs and efforts associated with the availing of carbon credits shall be borne by the Generating Company. Further, the entire proceeds of carbon credit from approved CDM project, if any, shall be retained by the Generating Company.

2.7. APPLICABILITY OF TARIFF ORDER

This Tariff Order shall be applicable for Existing RE Projects and New RE Projects to be commissioned during FY 2010-11. The applicable Tariff Rate, Tariff Structure and other terms and conditions for Existing RE Projects and New RE Projects in respect of each type of RE technology has been covered in detail under technology-specific sections.



Existing RE Project: As per Regulation 2.1 (k) of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, Existing RE project has been defined as the renewable energy project whose date of commissioning falls prior to date of notification of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010.

New RE Project: As per Regulation 2.1 (s) of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, New RE project has been defined as the renewable energy project whose date of commissioning is subsequent to the date of notification of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010. The following sections of the Order outline the technology-wise norms and corresponding Generic Tariff for Projects based on various renewable energy technologies.

Further, first and second proviso of Regulations 16.1 of Maharashtra Electricity Regulatory Commission (Renewable Purchase Obligation, its compliance and implementation of REC framework) Regulations, 2010 specify as under:

“Provided that the existing projects for which long term PPA are already put in place, shall be allowed to participate in REC scheme after the expiry of their existing PPA;

Provided further that prior termination of PPA shall not entitle existing renewable energy projects to participate in REC mechanism.”

3. WIND ENERGY PROJECTS

3.1. USEFUL LIFE

Regulation 2.1 (ff) of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 defines ‘useful life’ in relation to a unit of a generating station (including evacuation system) to mean the duration from the date of commercial operation (COD) till such time as specified under the MERC (Terms and Conditions for



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

3.2. TARIFF PERIOD

Regulation 6 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies the Tariff Period for various RE projects. Accordingly the Tariff Period for wind energy projects is 13 years, considered from the date of commercial operation of the RE project, and the tariff determined under the Regulations shall be applicable only for the duration of the Tariff Period.

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 MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010. In order to determine the yearly normative Capital Cost for such eligible Wind Energy Projects over the Control Period, the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specify an indexation mechanism 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. Further, Regulation 24 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides that the Capital Cost for wind power project shall include wind turbine generator including its auxiliaries, land cost, site development charges and other civil works, transportation charges, evacuation cost up to inter-connection point, financing charges and Interest during Construction (IDC).

Regulation 24.2 specifies the normative Capital Cost for wind energy projects for FY 2010-11 as Rs. 467.13 Lakh/MW.



3.4. DEBT-EQUITY RATIO

Regulation 13.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides that the debt-equity ratio of 70:30 is to be considered for determination of generic tariff. In accordance with the debt equity ratio and the above stipulated Capital cost, the debt and equity component for wind energy projects works out to Rs. 326.99 Lakh per MW and Rs. 140.14 Lakh per MW, respectively, for FY 2010-11.

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 2010-11 works out as under:

Opening Equity (Rs lakh per MW)	140.14
Return on Equity for the first 10 years @ 19% (Rs lakh per MW)	26.63
Return on Equity after first 10 years @ 24% (Rs lakh per MW)	33.63

3.6. INTEREST ON LOAN

Regulation 14.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 stipulates that the loan tenure of 10 years is to be considered for the purpose of determination of generic tariff for RE projects. Regulation 14.2 provides for computation of the rate of interest on loan as under:

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

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



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

Accordingly, the weighted average of SBAR for FY 2009-10 (i.e., 11.87%) as shown in the Table below, plus 150 basis points, works out to an interest rate of 13.37%, which has been considered for Wind Energy Projects with a gross opening loan amount of Rs. 326.99 Lakh per MW in FY 2010-11.

Period	SBAR
1-April-2009 to 28-June-2009	12.25%
29-June-2009 to 31-March-2010	11.75%
Avg. SBAR	11.87%

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

3.7. DEPRECIATION

Regulation 15 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides that depreciation is allowed up to a maximum of 90% of the Capital Cost of the asset and the depreciation rate for the first 10 years of the Tariff Period shall be 7% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 11th year onwards.

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

3.8. INTEREST ON WORKING CAPITAL

Regulation 17.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides for computation of the working capital requirements of the wind projects as under:

- "(a) Operation & Maintenance expenses for one month;*
- (b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;*



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

Further, Regulation 17.3 specifies that Interest on Working Capital shall be computed at an interest rate equivalent to average State Bank Advance Rate (SBAR) during the previous year plus 100 basis points. Para 2.6 of this Order shows that average SBAR for FY 2009-10 is 11.87%. Accordingly, the rate of Interest on Working Capital for wind energy projects in FY 2010-11 works out to 12.87% (11.87% + 100 basis points).

3.9. OPERATION AND MAINTENANCE EXPENSES

In accordance with Regulation 27 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the normative O&M expenses for wind energy projects for FY 2010-11 is Rs 6.87 Lakh/MW, to be escalated at the rate of 5.72% per annum over the Tariff Period for determination of the levelled tariff.

3.10. CAPACITY UTILISATION FACTOR

In accordance with Regulation 26 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the norms for Capacity Utilization Factor (CUF) specified for wind energy projects are as under:

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

In accordance with Regulation 26.2 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the annual mean wind power density specified above is to be measured at 50 metre hub-height and as per Regulation 26.3, for the purpose of classification of wind energy project into particular wind zone class, the State-wise wind power density map prepared by Centre for Wind Energy Technology (C-WET) annexed as schedule to the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, is to be considered.



3.11. LEVELLISED TARIFF FOR NEW WIND ENERGY PROJECTS IN FY 2010-11

Accordingly, the generic tariffs for Wind Energy Projects for FY 2010-11 has been determined as under. The discount factor for carrying out levellisation of Tariff for wind energy projects works out to 15.96%.

Tariff for New RE Projects-Wind

Particular	Tariff Period	Levellised Total Tariff (FY2010-11)	Benefit of Accelerated Depreciation (if availed)	Net Levellised Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
		(Rs / kWh)	(Rs/kWh)	(Rs/kWh)
Wind Energy Projects				
Wind Zone -1	13	5.07	(0.78)	4.29
Wind Zone -2	13	4.41	(0.68)	3.73
Wind Zone -3	13	3.75	(0.58)	3.18
Wind Zone -4	13	3.38	(0.52)	2.86

Notes:

- The above Tariff shall be valid for Projects Commissioned in FY 2010-11.
- The above Tariff shall be valid for a Tariff Period of 13 years from the Commercial Operation Date (COD)

3.12. TARIFF FOR EXISTING WIND ENERGY PROJECTS IN FY 2010-11

In accordance with Regulation 3.2 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the tariff and other terms and conditions of existing RE Projects shall be governed by respective RE Tariff Orders and amendments thereof as issued from time to time by the Commission and the tariff, tariff structure and other conditions as specified under respective RE Tariff Order shall continue to be applicable for such existing RE projects over the duration of the Tariff Period as stipulated under respective RE Tariff Orders.

The Commission had issued a Tariff Order for Wind power technology dated November 24, 2003 in Case No. 17(3), 3, 4 & 5 of 2002. The validity of the Tariff Order as stipulated



in the said Order was initially till March 31, 2007, which was further extended to March 31, 2010 through the RPS Order dated August 16, 2006 (Case No.6 of 2006) issued by the Commission. The applicability of the same was subsequently extended vide Order dated March 31, 2010 (Case No. 116 of 2009) till issuance of new Tariff Orders for FY 2010-11.

In the above mentioned Tariff Order, Wind Power Projects were classified into three distinct groups, namely Group-I, Group-II and Group-III Projects based on the date of commissioning of such Projects. Wind Projects commissioned before December 27, 1999 belonged to Group-I, Projects commissioned after December 27, 1999 but on or before March 31, 2003 belonged to Group-II, and Projects commissioned from April 1, 2003 onwards belong to Group-III class of Projects.

In view of the extended applicability of the existing Tariff Order in the new Control Period (through Regulation 3.2) and on the basis of the Tariff, Tariff Structure and other conditions as stipulated in the existing Tariff Order, the Tariff for existing Wind Power Projects during FY 2010-11 shall be as under.



Tariff for Existing RE Project-Wind

Sl. No.	FY	Year	Group-I	Group-II								Group-III	
			(before 27th December, 1999)	(Projects Commissioned after 27th December, 1999 but On or before 31 March, 2003)								(Projects Commissioned From 1st April, 2003) Financial Year)	
				Year	1999-00	Year	2000-01	Year	2001-02	Year	2002-03	Year	2003-04
1	1994-95	1	2.25										
2	1995-96	2	2.36										
3	1996-97	3	2.47										
4	1997-98	4	2.58										
5	1998-99	5	2.69										
6	1999-00	6	2.80	1	2.80								
7	2000-01	7	2.91	2	2.91	1	2.91						
8	2001-02	8	3.02	3	3.02	2	3.02	1	3.02				
9	2002-03	9	3.13	4	3.13	3	3.13	2	3.13	1	3.13		
10	2003-04	10	3.24	5	3.24	4	3.24	3	3.24	2	3.24	1	3.50
11	2004-05	11	3.24	6	3.35	5	3.35	4	3.35	3	3.35	2	3.65
12	2005-06	12	3.24	7	3.46	6	3.46	5	3.46	4	3.46	3	3.80
13	2006-07	13	3.24	8	3.57	7	3.57	6	3.57	5	3.57	4	3.95
14	2007-08	14	3.35	9	2.52	8	3.68	7	3.68	6	3.68	5	4.10
15	2008-09	15	3.46	10	2.52	9	2.52	8	3.79	7	3.79	6	4.25
16	2009-10	16	3.57	11	2.52	10	2.52	9	2.52	8	3.90	7	4.40
17	2010-11	17	3.68	Beyond FY 2009-10, those projects whose PPA has expired shall have option to continue with the preferential Tariff or opt for pricing under REC mechanism (Clause 16.1 of MERC (Renewable Purchase Obligation, its compliance and implementation of REC framework) Regulations, 2010 and in accordance with second proviso to Regulation 3.1 of RE Tariff Regulations.								8	4.55
18	2011-12	18	3.79									9	4.70
19	2012-13	19	3.90									10	4.85
20	2013-14	20	4.01									11	5.00
21	2014-15											12	5.15
22	2015-16											13	5.30

Group I- Tariff started with 2.25 Rs/kWh for 1994-95 and escalated at the rate of 5% (i.e., 11 paise every year) till 10th year, then remained constant for next 3 years, then again escalated from 14th year onwards till 20th year at the same rate.

Group II- Tariff started with 2.25 Rs/kWh for 1994-95 with 5% simple escalation (i.e., 11 paise every year) for 8 years.

The Commission has ruled in its Order in Case No. 58 of 2008 that the tariff on ad-interim basis for wind energy injection into the Grid by Wind Energy developers under Group-II category post expiry of their respective EPAs, shall be Rs 2.52 per unit. For FY 2010-11, in case the Wind developer chooses to sell at preferential Tariff, the Tariff of Rs 2.52/kWh shall be applicable.

Group III- Tariff started with 3.50 Rs/kWh in 2003-04 and increases at the rate of 15 paise per year for 13 years. The starting rate will be applicable from the year of Commissioning of the Wind Project.



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 the Regulation 2.1 (ff) is 35 years from COD.

4.2. TARIFF PERIOD

Regulation 6.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies a Tariff Period of 13 years for Small Hydro Projects of capacities above 5 MW and lower than or equal to 25 MW.

Regulation 6.2 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies a Tariff Period of 35 years for Mini/Micro Hydro projects and Small hydro projects upto and including 5 MW. The Tariff Period matches the useful life in case of these Projects, reflecting a longer preferential treatment for such Projects.

4.3. CAPITAL COST OF SMALL HYDRO PROJECTS

SHPs for the purpose of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 cover those projects, which are located at the sites approved by the State Nodal Agency/State Government using new plant and machinery and with installed power plant capacity lower than or equal to 25 MW. Further, for the purpose of specifying allowable Capital Cost, SHPs have been classified into two categories based on their installed capacities, viz., a) Small Hydro Projects above 1 MW and up to and including 5 MW, and b) Small Hydro Projects of capacities above 5 MW and lower than or equal to 25 MW.

Regulation 28.1 specifies the normative Capital Cost for SHPs for FY 2010-11 as under:

Project Size	Capital Cost (FY 2010-11) (Rs. Lakh/ MW)
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Project Size	Capital Cost (FY 2010-11) (Rs. Lakh/ MW)
> 1 MW and upto and including 5 MW	498.88
> 5 MW to 25 MW	453.53

4.4. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the debt and equity component for SHP having capacities above 1MW and up to and including 5MW works out to Rs. 349.21 Lakh and Rs. 149.66 Lakh, respectively, and for projects having capacities above 5 MW and lower than or equal to 25 MW, the debt and equity component works out to Rs. 317.47 lakh per MW and Rs. 136.06 Lakh per MW, respectively.

4.5. RETURN ON EQUITY

In accordance with the Regulation 16 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the RoE works out to be as shown in the Table below:

Particulars	> 1 MW and upto and including 5 MW	> 5 MW to 25 MW
Opening Equity (in Rs lakh per MW)	149.66	136.06
Return on Equity for the first 10 years @19% (Rs lakh per MW)	28.44	25.85
Return on Equity after first 10 years @24% (Rs lakh per MW)	35.92	32.65



4.6. INTEREST ON LOAN

In accordance with Regulation 14 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, as computed above, the interest rate of 13.37% (11.87% +150 basis points) has been considered for small hydro projects having capacities above 1MW and up to and including 5MW with a gross opening loan amount of Rs. 349.3 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. 317.8 Lakh per MW.

4.7. DEPRECIATION

In accordance with Regulation 15 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the depreciation will be charged at 7% for the first 10 years, and at 0.80% thereafter for the remaining useful period of 25 years for SHPs.

4.8. INTEREST ON WORKING CAPITAL

Regulation 17 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides for computation of the working capital requirements of the SHPs as under:

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

Further, in accordance with Regulation 17.3, the Interest on Working Capital for small hydro projects in FY 2010-11 works out to 12.87% (11.87% + 100 basis points).

4.9. OPERATION AND MAINTENANCE EXPENSES

Regulation 32 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provide for the normative O&M expenses for small hydro projects for FY 2010-11, to be escalated at the rate of 5.72% per annum over the Tariff Period for determination of the levelled tariff. The table below presents the normative O&M expenses considered by the Commission for small hydro power for FY 2010-11:



Project Size	O&M expenses (Rs Lakh/MW)
> 1 MW and up to and including 5 MW	17.97
5 MW to 25 MW	12.69

4.10. CAPACITY UTILISATION FACTOR (CUF)

In accordance with Regulation 30 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, a CUF of 30% has been considered for determination of Tariff for SHPs.

4.11. AUXILIARY POWER CONSUMPTION

In accordance with Regulation 31 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the Normative Auxiliary Consumption of 1.0% has been considered for determination of tariff of SHPs.

4.12. LEVELLISED TARIFF FOR NEW SMALL HYDRO PROJECTS IN FY 2010-11

In light of the above parameters and the discount factor worked out as 16.13% for levellisation of tariff for SHPs, the generic tariffs for Small Hydro Projects for FY 2010-11 have been determined as under:

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

Particulars		Tariff period	Levelling Total Tariff (FY2010-11)	Benefit of Accelerated Depreciation (if availed)	Net Levellised Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
		years	(Rs / kWh)	(Rs/kWh)	(Rs/kWh)
Small Hydro Project					
Mini and Micro Hydro Projects	1 MW & below	35	4.76	(0.56)	4.20
Other Small Hydro Projects	above 1 MW & upto and including 5MW	35	4.26	(0.57)	3.70
	above 5 MW & upto and including 25 MW	13	3.65	(0.51)	3.14



- The above Tariff shall be valid for Projects commissioned in FY 2010-11.
- The above Tariff shall be valid for a tariff period of 35 years from their Commercial Operation Date (COD) for Projects less than and including 5 MW, and for 13 years for Projects with installed capacity greater than 5 MW and upto and including 25 MW

4.13. LEVELLISED TARIFF FOR MINI/MICRO HYDRO PROJECTS IN FY 2010-11

Regulation 33 of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies that the tariff for Mini/Micro Hydro Projects shall be higher by Rs 0.50/kWh over and above the tariff applicable for Small Hydro Projects with installed capacity more than 1 MW but upto and including 5 MW. Accordingly, the Levellised Tariff for Mini/Micro Hydro Projects in FY 2010-11 with capacity less than 1 MW shall be Rs 4.76 / kWh (Rs 4.26/kWh + Rs 0.50/kWh) and Rs 4.20/kWh (Rs 3.70/kWh + Rs 0.50/kWh) in case benefit of accelerated depreciation are availed.

4.14. TARIFF FOR EXISTING SMALL HYDRO PROJECTS IN FY 2010-11

In accordance with Regulation 3.2 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the tariff and other terms and conditions of existing RE Projects, shall be governed by respective RE Tariff Orders and amendments thereof as issued from time to time by the Commission, and shall continue to be applicable for such existing RE projects over the duration of the Tariff Period as stipulated under respective RE Tariff Orders.

The Commission had issued a Tariff Order for Small Hydro Projects dated November 9, 2005 in Case No. 25 of 2004. The Commission, in the Tariff Order had stipulated that the Commission would review the tariff rate and structure after 5 years from the date of applicability of the SHP policy notified by the Government of Maharashtra or on commissioning of 200 MW of SHPs in the State, whichever is earlier. Validity of this Tariff was further extended to March 31, 2010 through the RPS Order (Case No.6 of 2006) issued by the Commission. The applicability of the same was subsequently extended till issuance of new Tariff Orders for the next Control Period (FY 2010-11 to FY 2014-15) through an Order dated March 31, 2010 in Case No. 116 of 2009.



In view of the extended applicability of the existing Tariff Order in the new Control Period (through Regulation 3.2) and on the basis of the Tariff, Tariff Structure and other conditions as stipulated in the existing Tariff Order, the Tariff for existing Small Hydro Projects during FY 2010-11 shall be as follows:

Tariff for Existing RE Projects-Small Hydro Projects

Sl. No.	Financial year	Existing Projects		Sl. No.	Financial year	Existing Projects	
		Year of Operation	2005-06			Year of Operation	2005-06
1	2005-06	1	2.84	11	2015-16	11	3.11
2	2006-07	2	2.87	12	2016-17	12	3.11
3	2007-08	3	2.90	13	2017-18	13	3.11
4	2008-09	4	2.93	14	2018-19	14	3.11
5	2009-10	5	2.96	15	2019-20	15	3.11
6	2010-11	6	2.99	16	2020-21	16	3.14
7	2011-12	7	3.02	17	2021-22	17	3.17
8	2012-13	8	3.05	18	2022-23	18	3.20
9	2013-14	9	3.08	19	2023-24	19	3.23
10	2014-15	10	3.11	20	2024-25	20	3.26

Tariff in the first year of the project is Rs 2.84/unit, and increases by Rs.0.03/unit every year till the debt repayment is over i.e., in the 10th year. The tariff shall remain constant at Rs 3.11/unit between the 10th year and the 15th year after which it again increases annually at a constant rate of Re 0.03/unit.

5. BIOMASS POWER PROJECTS

5.1. KEY PROVISIONS OF RE TARIFF REGULATIONS

In accordance with MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 the applicable Tariff and terms and conditions of Tariff for new as well as existing Biomass Power Projects as specified under existing RE Tariff Order shall continue to be applicable for the first three years of the new Control Period (i.e., FY 2010-11, FY 2011-12, and FY 2012-13). The relevant extract of the MERC (Terms and



Conditions for determination of RE Tariff) Regulations, 2010, namely, Regulation 3.3 is reproduced as under:

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

Further, Chapter 5 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides technology specific norms for determination of tariff for Biomass Power Projects and the same shall be applicable to new Biomass Projects only from fourth year of the Control Period, i.e., from FY 2013-14. The relevant Regulations specifying the applicability of such norms is reproduced as under:

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

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

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

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

"47.1 In case of (existing and new) biomass power projects, the following indexing mechanism for adjustment of fuel prices for each year of operation, from April 1,



2013, will be applicable for determination of applicable variable charge component of tariff:

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

Where,

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

From the above mentioned provisions of MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the Tariff for existing and new Biomass Power Projects in FY 2010-11 shall be as per the Biomass Tariff Order already issued by the Commission.

5.2. RELEVANT BIOMASS TARIFF ORDERS

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

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



- d) Subsequently, the Commission issued Orders for revision of Variable Charge component of Tariff on March 25, 2009 and thereafter on December 14, 2009 (Case No. 83 of 2008) upon scrutiny of submissions of few operational biomass power projects. As stipulated in the Order dated December 14, 2009, the revised variable charge component was applicable till March 31, 2010.
- e) The applicability of the tariffs as determined through the above Orders was subsequently extended till the issuance of new Tariff Orders for the next Control Period (FY 2010-11 to FY 2014-15) through an Order dated March 31, 2010 in Case No. 116 of 2009.

In accordance with Regulation 3.3 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, and on the basis of the Tariff, Tariff Structure and other conditions as stipulated in the existing Tariff Order, the Tariff for existing and new Biomass Power Projects during FY 2010-11 shall be as elaborated in the following section.

5.3. TARIFF FOR EXISTING AND NEW BIOMASS POWER PROJECTS

Tariff for Existing and New Biomass Power Projects

Financial Year	Fixed Charge (Rs/kWh)	Variable Charge (Rs/kWh)	Tariff (Rs/kWh)
2010-11	1.70	3.28	4.98

The Tariff Rate comprises two parts, viz., (i) fixed charge component, and (ii) variable charge component and shall be applicable for sale of power by rankine cycle based biomass power project to distribution licensees within Maharashtra during FY 2010-11.



6. NON-FOSSIL FUEL BASED CO-GENERATION PROJECT

6.1. KEY PROVISIONS OF RE TARIFF REGULATIONS

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

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

Further, Chapter 6 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides technology specific norms for determination of tariff for non-fossil fuel based co-generation projects and the same are applicable to existing and new non-fossil fuel based co-generation projects only from fourth year of the Control Period, i.e., from FY 2013-14. The relevant Regulations specifying the applicability of such norms is reproduced as under.

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

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

Provided that norms in respect of specific fuel consumption, Gross Calorific Value and Auxiliary Consumption factor for existing non-fossil fuel based co-



generation projects shall be as stipulated under the respective RE tariff Order as referred under Regulation 3.2."

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

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

The indexed Bagasse Fuel Price (P_n) in case of Non-fossil fuel based Co-generation projects for each year (n) of the Control Period shall be notified pursuant to notification of such indexed Bagasse Fuel Price norm as applicable for Non-fossil fuel based Co-generation projects within Maharashtra by Central Electricity Regulatory Commission in accordance with indexation mechanism stipulated under CERC RE Tariff Regulations.

Where,

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

Thus, the Tariff for existing and new non-fossil fuel based co-generation projects in FY 2010-11 shall be as per the relevant Tariff Order for non-fossil fuel based co-generation projects as already issued by the Commission.

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

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



- a) Order dated August 16, 2002 in Case No. 8/9/10/15/17/18/19/20/21 of 2001 for purchase of power from non-fossil fuel based co-generation projects and in the matter of aiding the State Government in formulation of the Policy.
- b) The Tariff Rate and tariff structure, as approved, was valid till March 31, 2007 or 300 MW of capacity addition whichever is earlier. Subsequently, through RPS Order (Case No. 6 of 2006), the Commission extended the validity of the Tariff Rate, tariff structure and other conditions of said Order for co-generation projects to be commissioned upto March 31, 2010.
- c) The Commission issued a Clarificatory Order dated November 21, 2003 specifying the qualification criteria for co-generation projects and outlining the measurement and verification protocol for compliance monitoring.
- d) Subsequently, the Commission issued an Interim Order for review of tariff rate and tariff structure for non-fossil fuel based grid connected Cogeneration projects on January 11, 2010 (Case No. 123 of 2008) upon scrutiny of submissions made by Cogeneration Association of India.

In accordance with Regulation 3.3 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, and on the basis of the Tariff, Tariff Structure and other conditions as stipulated in the existing Tariff Order, the Tariff for existing and new non-fossil fuel based co-generation projects during FY 2010-11 shall be as elaborated in the following section.

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

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

Financial Year	Fixed Charge (Rs/kWh)	Variable Charge (Rs/kWh)	Tariff (Rs/kWh)
2010-11	2.26	2.53	4.79



The Tariff Rate comprises of two parts, viz., (i) fixed charge component, and (ii) variable charge component and shall be applicable for sale of power by non-fossil fuel based co-generation project to distribution licensees within Maharashtra during FY 2010-11.

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

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

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

In this context, the Commission has determined the Tariff for non-qualifying non-fossil fuel based co-generation (NQNFCC) projects as Rs 1.94/kWh with escalation of 2% per annum on compounded basis under its Order (Case 26 of 2004) dated May 25, 2005. Accordingly, the Tariff Rate for existing non-qualifying non-fossil fuel based co-generation projects for FY 2010-11 works out to Rs 2.14/kWh.

Hence, the Commission hereby rules that the Tariff Rate for Non-Qualifying non-fossil fuel based Co-generation projects (existing and new) shall be Rs 2.14/kWh.



7. SOLAR PHOTOVOLTAIC (PV) PROJECTS

7.1. USEFUL LIFE

Regulation 2.1 (ff) of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 defines 'useful life' in relation to a unit of a generating station (including evacuation system) to mean the duration from the date of commercial operation (COD) till such time as specified under the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 for such generation facility. Accordingly, as per Regulation 2.1 (ff), the useful life specified for Solar PV Projects shall be 25 years.

7.2. CONTROL PERIOD

The generic tariff determined for Solar PV projects based on the Capital Cost and other norms applicable for FY 2010-11 shall also apply for such projects during FY 2011-12, provided that (i) the Power Purchase Agreements (PPA) in respect of the Solar PV projects as mentioned in this Clause are signed on or before March 31, 2011; and (ii) the entire capacity covered by the Power Purchase Agreements is commissioned on or before March 31, 2012 in respect of Solar PV projects.

7.3. TARIFF PERIOD

Regulation 6 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies the Tariff Period for Solar PV projects as 25 years. In terms of Regulation 6.4 and 6.5 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the Tariff Period specified shall be reckoned from the date of commercial operation of the RE projects and the tariff determined under the Regulations shall be applicable only for the duration of the Tariff Period.

7.4. CAPITAL COST OF SOLAR PV PROJECTS

Regulation 66 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 has specified the normative Capital Cost for Solar PV power projects as Rs.1690 Lakh/MW for FY 2010-11.



7.5. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the normative debt and equity component for Solar PV Projects shall be Rs. 1183 Lakh per MW and Rs. 507 Lakh per MW, respectively.

7.6. RETURN ON EQUITY

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

Particulars	Solar PV
Opening Equity (in Rs lakh per MW)	507.00
Return on Equity for the first 10 years @ 19% (in Rs lakh per MW)	96.33
Return on Equity after first 10 years @24% (in Rs lakh per MW)	121.68

7.7. INTEREST ON LOAN

In accordance with Regulation 14 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 and as computed earlier, the interest rate of 13.37% (11.87% + 150 basis points) has been considered for Solar PV Projects with a gross opening loan amount of Rs. 1183 Lakh per MW in FY 2010-11.

7.8. DEPRECIATION

In accordance with Regulation 15 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the depreciation will be charged at 7% for the first 10 years and at 1.33% thereafter for the remaining useful period of 15 years for Solar PV projects.



7.9. INTEREST ON WORKING CAPITAL

Regulation 17.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides for computation of the working capital requirements for Solar PV Projects as under:

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

In accordance with Regulation 17.3, the Interest on Working Capital for Solar PV Projects for FY 2010-11 works out to 12.87%.

7.10. OPERATION AND MAINTENANCE EXPENSES

Regulation 68 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides the normative O&M expenses for small Solar PV projects for FY 2010-11 as Rs. 9.51 Lakh/MW, which is to be escalated at the rate of 5.72% per annum over the Tariff Period, for determination of the levellised tariff.

7.11. CAPACITY UTILISATION FACTOR

In accordance with Regulation 67 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the CUF of 19% has been considered for determination of Tariff for Solar PV power projects in FY 2010-11.

7.12. LEVELLISED TARIFF FOR SOLAR PV POWER PROJECTS IN FY 2010-11

In light of the parameters discussed in the preceding paragraphs and with respect to the discount factor of 15.96% derived based on the methodology stipulated in Section 1.4 of this Order, the generic tariffs for Solar PV Projects for FY 2010-11 have been determined as under:



Tariff for New RE Projects-Solar Power Projects

Particular	Tariff period	Levelling Tariff (FY2010-11)	Benefit of Accelerated Depreciation (if availed)	Net Levellised Tariff(upon adjusting for Accelerated Depreciation)
	years	(Rs / kWh)	(Rs/kWh)	(Rs/kWh)
Solar Power Projects				
Solar PV Projects	25	17.91	(2.96)	14.95

The Tariff specified for Solar PV Projects shall be valid for Projects Commissioned in FY 2010-11 and FY 2011-12 as well, and shall be valid for a tariff period of 25 years from the Commercial Operation Date (COD).

7.13. LEVELLISED TARIFF FOR SOLAR ROOFTOP PV AND OTHER SMALL SOLAR PROJECTS IN FY 2010-11

Regulation 68 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies that the tariff for Solar Rooftop PV projects and other small solar projects will be Rs 0.50 /kWh higher than the Tariff specified for Solar PV projects in the Regulations. Accordingly, the Tariff for such Projects in FY 2010-11 shall be as follows:

Tariff for New RE Projects-Solar Power Projects				
[refer Regulation 68.1 of MERC (Terms and conditions of RE tariff) Regulations, 2010]				
Particular	Tariff period	Levelling Tariff (FY2010-11)	Benefit of Accelerated Depreciation (if availed)	Net Levellised Tariff(upon adjusting for Accelerated Depreciation)
	years	(Rs / kWh)	(Rs/kWh)	(Rs/kWh)
Solar Power Projects				
Solar rooftop PV and other small solar power Projects	25	18.41	(2.96)	15.45

The Tariff specified for Solar rooftop PV and Other Small Solar Power Projects shall be valid for projects Commissioned in FY 2010-11 and FY 2011-12 as well, and shall be valid for a tariff period of 25 years from the Commercial Operation Date (COD).



8. SOLAR THERMAL PROJECTS

8.1. USEFUL LIFE

Regulation 2.1 (ff) of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 defines 'useful life' in relation to a unit of a generating station (including evacuation system) to mean the duration from the date of commercial operation (COD) till such time as specified under the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 for such generation facility. Accordingly, as per Regulation 2.1 (ff), the useful life specified for Solar thermal projects shall be 25 years.

8.2. CONTROL PERIOD

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

8.3. TARIFF PERIOD

Regulation 6 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 specifies the Tariff Period for Solar thermal projects as 25 years. In terms of Regulations 6.4 and 6.5 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the Tariff Period specified shall be reckoned from the date of commercial operation of the RE projects and the tariff determined under the Regulations shall be applicable only for the duration of the Tariff Period.

8.4. CAPITAL COST OF SOLAR THERMAL PROJECTS

Regulation 70 specifies the normative Capital Cost for Solar thermal projects as Rs.1530 Lakh/MW for FY 2010-11.



8.5. DEBT-EQUITY RATIO

In accordance with Regulation 13.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the normative debt and equity component for Solar thermal projects shall be Rs. 1071 Lakh per MW and Rs. 459 Lakh per MW, respectively.

8.6. RETURN ON EQUITY

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

Particulars	Solar PV
Opening Equity (in Rs lakh per MW)	459.00
Return on Equity for the first 10 years @19% (in Rs lakh per MW)	87.21
Return on Equity after first 10 years @24% (in Rs lakh per MW)	110.16

8.7. INTEREST ON LOAN

In accordance with Regulation 14 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the interest rate of 13.37% (11.87% + 150 basis points) has been considered for determination of Tariff for Solar thermal projects with a gross opening loan amount of Rs. 1071 Lakh per MW in FY 2010-11.

8.8. DEPRECIATION

In accordance with Regulation 15 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the depreciation will be charged at 7% for the first 10 years, and at 1.33% thereafter for the remaining useful period of 15 years for Solar thermal projects.



8.9. INTEREST ON WORKING CAPITAL

Regulation 17.1 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides for computation of the working capital requirements of the Solar thermal projects as under:

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

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

Accordingly, the Interest on Working Capital for Solar thermal projects for FY 2010-11 works out to 12.87%.

8.10. OPERATION AND MAINTENANCE EXPENSES

Regulation 73 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010 provides the normative O&M expenses for solar thermal power projects for FY 2010-11 as Rs. 13.74 Lakh/MW, to be escalated at the rate of 5.72% per annum over the Tariff Period for determination of the levellised tariff.

8.11. CAPACITY UTILISATION FACTOR

In accordance with Regulation 72 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the CUF of 23% is considered for determination of tariff for solar thermal projects.

8.12. AUXILIARY POWER CONSUMPTION

In accordance with Regulation 74 of the MERC (Terms and Conditions for determination of RE Tariff) Regulations, 2010, the auxiliary power consumption factor for determination of tariff of solar thermal power projects is 10.00%.



8.13. LEVELLISED TARIFF FOR SOLAR THERMAL PROJECTS IN FY 2010-11

In light of the parameters discussed in the preceding paragraphs and with respect to the discount factor of 15.96% derived based on the methodology stipulated in Section 1.4 of this Order, the generic tariff for Solar Thermal Projects for FY 2010-11 has been determined as under:

Tariff for New RE Projects-Solar Power Projects				
Particular	Tariff period	Levelling Tariff (FY2010-11)	Benefit of Accelerated Depreciation (if availed)	Net Levelling Tariff (upon adjusting for Accelerated Depreciation)
	years	(Rs / kWh)	(Rs/kWh)	(Rs/kWh)
Solar Power Projects				
Solar Thermal	25	15.31	(2.46)	12.85

The Tariff specified for Solar Thermal Power Projects shall be valid for Projects Commissioned in FY 2010-11, FY 2011-12 and FY 2012-13 as well, and shall be valid for a tariff period of 25 years from the Commercial Operation Date (COD).

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
A	Wind Power Projects	
	Wind Zone-I	Annexure 1A
	Wind Zone-II	Annexure 1B
	Wind Zone III	Annexure 1C
	Wind Zone IV	Annexure 1D
B	Small Hydro Power Projects	
	SHP Projects Less than 5 MW	Annexure 2A
	SHP Projects between 5 MW and 25 MW	Annexure 2B
C	Solar Projects	
	Solar PV Projects	Annexure 3
	Solar Thermal Projects	Annexure 4



(V. L. Sonavane)
Member

(V. P. Raja)
Chairman

(K. N. Khawarey)
Secretary, MERC

Annexure – 1A
(Wind Zone-1)



Form 1.1 Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Base Case Wind Zone 1
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	20%
			Deration Factor	%	0.00%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	467.13
3	Sources of Fund		Tariff Period	Years	13
			<u>Debt: Equity</u>		
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	326.99
			Total Equity Amount	Rs Lacs	140.14
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	326.99
			Moratorium Period	years	0
			Repayment Period(incld Moratorium)	years	10
			Interest Rate	%	13.37%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	140
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		15.96%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.99%
			80 IA benefits	Yes/No	Yes
			<u>Depreciation</u>		
			Depreciation Rate for first 10 years	%	7.00%
Depreciation Rate 11th year onwards	%	1.33%			
Years for 7% rate		10			
5	Working Capital	<u>For Fixed Charges</u>	O&M Charges	Months	1
			Maintenance Spare	(% of O&M exepenses)	15%
			Receivables for Debtors	Months	2
			<u>For Variable Charges</u>		
Interest On Working Capital	%	12.87%			
6	Operation & Maintenance		power plant (FY10-11)		6.87
			Total O & M Expenses Escalation	%	5.72%



Form 1.2 Form Template for (Wind Power Projects under Zone - 1) : Determination of Tariff Component

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		6.87	7.26	7.68	8.12	8.58	9.07	9.59	10.14	10.72	11.33	11.98	12.67	13.39	14.16	14.97	15.82	16.73	17.69	18.70	19.77	20.90	22.09	23.36	24.69	26.11
Depreciation	Rs Lakh		32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70
Interest on term loan	Rs Lakh		41.54	37.17	32.79	28.42	24.05	19.68	15.30	10.93	6.56	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		2.57	2.50	2.42	2.35	2.28	2.21	2.14	2.07	2.01	1.94	1.50	1.54	1.58	1.62	1.66	1.71	1.75	1.80	1.86	1.91	1.97	2.04	2.10	2.17	2.25
Return on Equity	Rs Lakh		26.63	26.63	26.63	26.63	26.63	26.63	26.63	26.63	26.63	26.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63
Total Fixed Cost	Rs Lakh		110.31	106.25	102.22	98.22	94.24	90.28	86.36	82.47	78.61	74.79	53.35	54.07	54.83	55.64	56.49	57.39	58.35	59.35	60.42	61.54	62.73	63.99	65.32	66.73	68.21

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levillise	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh		0.39	0.41	0.44	0.46	0.49	0.52	0.55	0.58	0.61	0.65	0.68	0.72	0.76	0.81	0.85	0.90	0.95	1.01	1.07	1.13	1.19	1.26	1.33	1.41	1.49
Depreciation	Rs/kWh		1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
Int. on term loan	Rs/kWh		2.37	2.12	1.87	1.62	1.37	1.12	0.87	0.62	0.37	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.15	0.14	0.14	0.13	0.13	0.13	0.12	0.12	0.11	0.11	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.13
RoE	Rs/kWh		1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92
Total COG	Rs/kWh		6.30	6.06	5.83	5.61	5.38	5.15	4.93	4.71	4.49	4.27	3.04	3.09	3.13	3.18	3.22	3.28	3.33	3.39	3.45	3.51	3.58	3.65	3.73	3.81	3.89

Discount Factor			1	0.862	0.744	0.641	0.553	0.477	0.411	0.355	0.306	0.264	0.227	0.196	0.169	0.146	0.126	0.108	0.094	0.081	0.070	0.060	0.052	0.045	0.038	0.033	0.029
Levillised Tariff	5.07	Rs/Unit																									



Determination of Accelerated Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	33.99%
Capital Cost	467.13

Years ----->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%
Book Depreciation	Rs Lakh	12.33	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	13.45	0.00	0.00

Accelerated Depreciation																						
Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Depn.	Rs Lakh	186.85	224.22	44.84	8.97	1.79	0.36	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

Net Depreciation Benefit	Rs Lakh	174.52	199.56	20.18	-15.70	-22.87	-24.31	-24.59	-24.65	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-13.45	0.00	0.00
Tax Benefit	Rs Lakh	59.32	67.83	6.86	-5.33	-7.77	-8.26	-8.36	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-4.57	0.00	0.00
Energy generation	MU	0.88	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Discounting Factor		1.00	0.93	0.80	0.69	0.60	0.51	0.44	0.38	0.33	0.28	0.24	0.21	0.18	0.16	0.14	0.12	0.10	0.09	0.07	0.06	

Levellised benefit	0.78	Rs/Unit
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**Annexure – 1B
(Wind Zone-2)**

Form 1.1 Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Base Case Wind Zone 2	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	23%	
			Deration Factor	%	0.00%	
			Useful Life	Years	25	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	467.13	
3	Sources of Fund		Tariff Period	Years	13	
			<u>Debt: Equity</u>			
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	326.99	
			Total Equity Amount	Rs Lacs	140.14	
			<u>Debt Component</u>			
			Loan Amount	Rs Lacs	326.99	
			Moratorium Period	years	0	
			Repayment Period(incld Moratorium)	years	10	
			Interest Rate	%	13.37%	
			<u>Equity Component</u>			
			Equity amount	Rs Lacs	140	
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		15.96%				
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.99%	
			80 IA benefits	Yes/No	Yes	
			<u>Depreciation</u>			
			Depreciation Rate for first 10 years	%	7.00%	
Depreciation Rate 11th year onwards	%	1.33%				
Years for 7% rate		10				
5	Working Capital		<u>For Fixed Charges</u>			
			O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			<u>For Variable Charges</u>			
Interest On Working Capital	%	12.87%				
6	Operation & Maintenance		power plant (FY10-11)		6.87	
			Total O & M Expenses Escalation	%	5.72%	



Form 1.2 Form Template for (Wind Power Projects under Zone - 2) : Determination of Tariff Component

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		6.87	7.26	7.68	8.12	8.58	9.07	9.59	10.14	10.72	11.33	11.98	12.67	13.39	14.16	14.97	15.82	16.73	17.69	18.70	19.77	20.90	22.09	23.36	24.69	26.11
Depreciation	Rs Lakh		32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23
Interest on term loan	Rs Lakh		41.54	37.17	32.79	28.42	24.05	19.68	15.30	10.93	6.56	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Interest on working Capital	Rs Lakh		2.57	2.50	2.42	2.35	2.28	2.21	2.14	2.07	2.01	1.94	1.50	1.54	1.58	1.62	1.66	1.71	1.75	1.80	1.86	1.91	1.97	2.04	2.10	2.17	2.25
Return on Equity	Rs Lakh		26.63	26.63	26.63	26.63	26.63	26.63	26.63	26.63	26.63	26.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63
Total Fixed Cost	Rs Lakh		110.31	106.25	102.22	98.22	94.24	90.28	86.36	82.47	78.61	74.79	53.35	54.07	54.83	55.64	56.49	57.39	58.35	59.35	60.42	61.54	62.73	63.99	65.32	66.73	68.21

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levellise	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh		0.34	0.36	0.38	0.40	0.43	0.45	0.48	0.50	0.53	0.56	0.59	0.63	0.66	0.70	0.74	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30
Depreciation	Rs/kWh		1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	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	0.31	0.31
Int. on term loan	Rs/kWh		2.06	1.84	1.63	1.41	1.19	0.98	0.76	0.54	0.33	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.13	0.12	0.12	0.12	0.11	0.11	0.11	0.10	0.10	0.10	0.07	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11
RoE	Rs/kWh		1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67	1.67
Total COG	Rs/kWh		5.47	5.27	5.07	4.87	4.68	4.48	4.29	4.09	3.90	3.71	2.65	2.68	2.72	2.76	2.80	2.85	2.90	2.95	3.00	3.05	3.11	3.18	3.24	3.31	3.39

Discount Factor			1	0.862	0.744	0.641	0.553	0.477	0.411	0.355	0.306	0.264	0.227	0.196	0.169	0.146	0.126	0.108	0.094	0.081	0.070	0.060	0.052	0.045	0.038	0.033	0.029
Levellised Tariff	4.41	Rs/Unit																									



Determination of Accelerated Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	33.99%
Capital Cost	467.13

Years ----->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%
Book Depreciation	Rs Lakh	12.33	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	13.45	0.00	0.00

Accelerated Depreciation		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	186.85	224.22	44.84	8.97	1.79	0.36	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

Net Depreciation Benefit	Rs Lakh	174.52	199.56	20.18	-15.70	-22.87	-24.31	-24.59	-24.65	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-13.45	0.00	0.00
Tax Benefit	Rs Lakh	59.32	67.83	6.86	-5.33	-7.77	-8.26	-8.36	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-4.57	0.00	0.00
Energy generation	MU	1.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01
Discounting Factor		1.00	0.93	0.80	0.69	0.60	0.51	0.44	0.38	0.33	0.28	0.24	0.21	0.18	0.16	0.14	0.12	0.10	0.09	0.07	0.06

Levellised benefit	0.68	Rs/Unit
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**Annexure – 1C
(Wind Zone-3)**



Form 1.1 Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Base Case Wind Zone 3	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	27%	
			Deration Factor	%	0.00%	
			Useful Life	Years	25	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	467.13	
3	Sources of Fund		Tariff Period	Years	13	
			<u>Debt: Equity</u>			
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	326.99	
			Total Equity Amout	Rs Lacs	140.14	
			<u>Debt Component</u>			
			Loan Amount	Rs Lacs	326.99	
			Moratorium Period	years	0	
			Repayment Period(incld Moratorium)	years	10	
			Interest Rate	%	13.37%	
			<u>Equity Component</u>			
			Equity amount	Rs Lacs	140	
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		15.96%				
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.99%	
			80 IA benefits	Yes/No	Yes	
			<u>Depreciation</u>			
			Depreciation Rate for first 10 years	%	7.00%	
Depreciation Rate 11th year onwards	%	1.33%				
Years for 7% rate		10				
5	Working Capital		<u>For Fixed Charges</u>			
			O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			<u>For Variable Charges</u>			
Interest On Working Capital	%	12.87%				
6	Operation & Maintenance		power plant (FY10-11)		6.87	
			Total O & M Expenses Escalation	%	5.72%	



Form 1.2 Form Template for (Wind Power Projects under Zone - 3) : Determination of Tariff Component

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		6.87	7.26	7.68	8.12	8.58	9.07	9.59	10.14	10.72	11.33	11.98	12.67	13.39	14.16	14.97	15.82	16.73	17.69	18.70	19.77	20.90	22.09	23.36	24.69	26.11
Depreciation	Rs Lakh		32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70
Interest on term loan	Rs Lakh		41.54	37.17	32.79	28.42	24.05	19.68	15.30	10.93	6.56	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Interest on working Capital	Rs Lakh		2.57	2.50	2.42	2.35	2.28	2.21	2.14	2.07	2.01	1.94	1.50	1.54	1.58	1.62	1.66	1.71	1.75	1.80	1.86	1.91	1.97	2.04	2.10	2.17	2.25
Return on Equity	Rs Lakh		26.63	26.63	26.63	26.63	26.63	26.63	26.63	26.63	26.63	26.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63
Total Fixed Cost	Rs Lakh		110.31	106.25	102.22	98.22	94.24	90.28	86.36	82.47	78.61	74.79	53.35	54.07	54.83	55.64	56.49	57.39	58.35	59.35	60.42	61.54	62.73	63.99	65.32	66.73	68.21

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levillised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh		0.29	0.31	0.32	0.34	0.36	0.38	0.41	0.43	0.45	0.48	0.51	0.54	0.57	0.60	0.63	0.67	0.71	0.75	0.79	0.84	0.88	0.93	0.99	1.04	1.10
Depreciation	Rs/kWh		1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Int. on term loan	Rs/kWh		1.76	1.57	1.39	1.20	1.02	0.83	0.65	0.46	0.28	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.11	0.11	0.10	0.10	0.10	0.09	0.09	0.09	0.08	0.08	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.10
RoE	Rs/kWh		1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42
Total COG	Rs/kWh		4.66	4.49	4.32	4.15	3.98	3.82	3.65	3.49	3.32	3.16	2.26	2.29	2.32	2.35	2.39	2.43	2.47	2.51	2.55	2.60	2.65	2.71	2.76	2.82	2.88

Discount Factor			1	0.862	0.744	0.641	0.553	0.477	0.411	0.355	0.306	0.264	0.227	0.196	0.169	0.146	0.126	0.108	0.094	0.081	0.070	0.060	0.052	0.045	0.038	0.033	0.029
Levillised Tariff	3.75	Rs/Unit																									



Determination of Accelerated Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	33.99%
Capital Cost	467.13

Years ----->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%
Book Depreciation	Rs Lakh	12.33	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	13.45	0.00	0.00

Accelerated Depreciation		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Depn.	Rs Lakh	186.85	224.22	44.84	8.97	1.79	0.36	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

Net Depreciation Benefit	Rs Lakh	174.52	199.56	20.18	-15.70	-22.87	-24.31	-24.59	-24.65	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-13.45	0.00	0.00
Tax Benefit	Rs Lakh	59.32	67.83	6.86	-5.33	-7.77	-8.26	-8.36	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-4.57	0.00	0.00
Energy generation	MU	1.18	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37
Discounting Factor		1.00	0.93	0.80	0.69	0.60	0.51	0.44	0.38	0.33	0.28	0.24	0.21	0.18	0.16	0.14	0.12	0.10	0.09	0.07	0.06	

Levellised benefit 0.58 Rs/Unit



**Annexure – 1D
(Wind Zone-4)**



Form 1.1 Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Base Case Wind Zone 4	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	30%	
			Deration Factor	%	0.00%	
			Useful Life	Years	25	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	467.13	
3	Sources of Fund	Debt: Equity	Tariff Period	Years	13	
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	326.99	
			Total Equity Amout	Rs Lacs	140.14	
			Debt Component	Loan Amount	Rs Lacs	326.99
				Moratorium Period	years	0
				Repayment Period(incld Moratorium)	years	10
				Interest Rate	%	13.37%
			Equity Component	Equity amount	Rs Lacs	140
				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		15.96%				
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.99%	
			80 IA benefits	Yes/No	Yes	
			Depreciation	Depreciation Rate for first 10 years	%	7.00%
				Depreciation Rate 11th year onwards	%	1.33%
				Years for 7% rate		10
5	Working Capital	For Fixed Charges	O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			For Variable Charges	Interest On Working Capital	%	12.87%
6	Operation & Maintenance	power plant (FY10-11)			6.87	
			Total O & M Expenses Escalation	%	5.72%	



Form 1.2 Form Template for (Wind Power Projects under Zone - 4) : Determination of Tariff Component

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

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		6.87	7.26	7.68	8.12	8.58	9.07	9.59	10.14	10.72	11.33	11.98	12.67	13.39	14.16	14.97	15.82	16.73	17.69	18.70	19.77	20.90	22.09	23.36	24.69	26.11
Depreciation	Rs Lakh		32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	32.70	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23	6.23
Interest on term loan	Rs Lakh		41.54	37.17	32.79	28.42	24.05	19.68	15.30	10.93	6.56	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Interest on working Capital	Rs Lakh		2.57	2.50	2.42	2.35	2.28	2.21	2.14	2.07	2.01	1.94	1.50	1.54	1.58	1.62	1.66	1.71	1.75	1.80	1.86	1.91	1.97	2.04	2.10	2.17	2.25
Return on Equity	Rs Lakh		26.63	26.63	26.63	26.63	26.63	26.63	26.63	26.63	26.63	26.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63	33.63
Total Fixed Cost	Rs Lakh		110.31	106.25	102.22	98.22	94.24	90.28	86.36	82.47	78.61	74.79	53.35	54.07	54.83	55.64	56.49	57.39	58.35	59.35	60.42	61.54	62.73	63.99	65.32	66.73	68.21

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levelling	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh		0.26	0.28	0.29	0.31	0.33	0.35	0.36	0.39	0.41	0.43	0.46	0.48	0.51	0.54	0.57	0.60	0.64	0.67	0.71	0.75	0.80	0.84	0.89	0.94	0.99
Depreciation	Rs/kWh		1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Int. on term loan	Rs/kWh		1.58	1.41	1.25	1.08	0.92	0.75	0.58	0.42	0.25	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.10	0.10	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09
RoE	Rs/kWh		1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28
Total COG	Rs/kWh		4.20	4.04	3.89	3.74	3.59	3.44	3.29	3.14	2.99	2.85	2.03	2.06	2.09	2.12	2.15	2.18	2.22	2.26	2.30	2.34	2.39	2.43	2.49	2.54	2.60

Discount Factor			1	0.862	0.744	0.641	0.553	0.477	0.411	0.355	0.306	0.264	0.227	0.196	0.169	0.146	0.126	0.108	0.094	0.081	0.070	0.060	0.052	0.045	0.038	0.033	0.029
Levallised Tariff	3.38	Rs/Unit																									



Determination of Accelerated Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	33.99%
Capital Cost	467.13

Years ----->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%
Book Depreciation	Rs Lakh	12.33	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	24.66	13.45	0.00	0.00

Accelerated Depreciation																					
Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	186.85	224.22	44.84	8.97	1.79	0.36	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

Net Depreciation Benefit	Rs Lakh	174.52	199.56	20.18	-15.70	-22.87	-24.31	-24.59	-24.65	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-24.66	-13.45	0.00	0.00
Tax Benefit	Rs Lakh	59.32	67.83	6.86	-5.33	-7.77	-8.26	-8.36	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-8.38	-4.57	0.00	0.00
Energy generation	MU	1.31	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63
Discounting Factor		1.00	0.93	0.80	0.69	0.60	0.51	0.44	0.38	0.33	0.28	0.24	0.21	0.18	0.16	0.14	0.12	0.10	0.09	0.07	0.06

Levellised benefit	0.52	Rs/Unit
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Annexure – 2A
(SHP above 1 MW and upto and including 5 MW)



1.1 Form Template for (above 1 MW upto 5 MW) Assumptions Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Maharashtra
					>1 MW up to and including 5 MW
1	Power Generation	Capacity	Installed Power Generation Capacity Capacity Utilization Factor Auxiliary Consumption Deration Factor Useful Life	MW % % % Years	1 30% 1% 0.00% 35
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	498.88
3	Financial Assumption	Debt: Equity Debt Component Equity Component	Tariff Period Debt Equity Total Debt Amount Total Equity Amount Loan Amount Moratorium Period Repayment Period(incld Moratorium) Intrest Rate Equity amount Normative ROE (Post-tax) Return on Equity for first 10 years RoE Period Return on Equity 11th year onwards Weighted average of ROE Discount Rate (equiv. to WACC) 11th year onwards	Years % % Rs Lacs Rs Lacs Rs Lacs years years % Rs Lacs % % p.a Year % p.a %	35 70% 30% 349 150 349 0 10 13.37% 149.66 16% 19% 10 24.00% 22.57% 16.13%
4	Financial Assumptions	Economic Assumptions Fiscal Assumptions Depreciation	Coal Price Escalation HSD Price Escalation Discount Rate Income Tax 80 IA benefits Depreciation Rate for first 10 years Depreciation Rate 11th year onwards Years for 7% rate	% p.a % p.a % p.a % Yes/No % % %	0 0% 0% 16% 0% 33.99% Yes 0.0% 7.00% 0.80% 10
5	Working Capital	For Fixed Charges O&M Charges Maintenance Spare Receivables for Debtors For Variable Charges Intrest On Working Capital	(% of O&M exepenses)	Months Months %	1 15% 2 12.87%
6	Operation & Maintenance	power plant (FY 10-11) Total O & M Expenses Escalation			17.97 5.72%



Form 1.2 Form Template for (>1 MW up to and including 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		17.97	19.00	20.08	21.23	22.45	23.73	25.09	26.52	28.04	29.65	31.34	33.13	35.03	37.03	39.15	41.39	43.76	46.26	48.91	51.71	54.66	57.79	61.09	64.59	68.28	72.19	76.32	80.68	85.30	90.18	95.34	100.79	106.56	112.65	119.09
Depreciation	Rs Lakh		34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92	34.92
Interest on term loan	Rs Lakh		44.36	39.69	35.02	30.35	25.68	21.01	16.34	11.67	7.00	2.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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		3.31	3.26	3.21	3.17	3.13	3.10	3.07	3.04	3.02	3.00	2.92	2.82	2.72	2.62	2.53	2.43	2.33	2.23	2.13	2.03	1.93	1.83	1.73	1.63	1.53	1.43	1.33	1.23	1.13	1.03	0.93	0.83	0.73	0.63	0.53
Return on Equity	Rs Lakh		28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44	28.44
Total Fixed Cost	Rs Lakh		129.00	125.31	121.68	118.12	114.62	111.20	107.86	104.60	101.42	98.34	95.37	92.50	89.72	87.03	84.43	81.91	79.48	77.14	74.89	72.72	70.63	68.61	66.66	64.78	62.97	61.23	59.56	57.96	56.42	54.94	53.52	52.15	50.83	49.56	

Levelised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levelised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M expn	RskWh		0.69	0.73	0.77	0.82	0.86	0.91	0.96	1.02	1.08	1.14	1.20	1.27	1.35	1.42	1.50	1.59	1.68	1.78	1.88	1.99	2.10	2.22	2.35	2.48	2.62	2.77	2.93	3.10	3.28	3.47	3.66	3.87	4.10	4.33	4.58
Depreciation	RskWh		1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34
Int. on term loan	RskWh		1.71	1.53	1.35	1.17	0.99	0.81	0.63	0.45	0.27	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	RskWh		0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.10	0.10	0.10	0.11	0.11	0.12	0.12	0.13	0.13	0.14	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.22	0.23	0.24	0.25	0.26	0.27	
RoE	RskWh		1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38
Total COG	RskWh	4.26	4.96	4.82	4.68	4.54	4.41	4.27	4.15	4.02	3.90	3.78	3.66	3.54	3.42	3.30	3.18	3.06	2.94	2.82	2.70	2.58	2.46	2.34	2.22	2.10	1.98	1.86	1.74	1.62	1.50	1.38	1.26	1.14	1.02		
Discount Factor			1	0.861	0.741	0.638	0.550	0.473	0.408	0.351	0.302	0.260	0.224	0.193	0.166	0.143	0.123	0.106	0.091	0.079	0.068	0.058	0.050	0.043	0.037	0.032	0.028	0.024	0.020	0.018	0.015	0.013	0.011	0.010	0.008	0.007	0.006
Levelised Tariff	Rs/Unit	4.26																																			



Determination of Accelerated Depreciation

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	33.99%
Capital Cost	498.9

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	13.17	26.34	26.34	26.34	26.34	26.34	26.34	26.34	26.34	26.34	26.34	26.34	26.34	26.34	26.34	26.34	26.34	14.37	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

Accelerated Depreciation

Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	199.55	239.46	47.89	9.58	1.92	0.38	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	186.38	213.12	21.55	-16.76	-24.43	-25.96	-26.26	-26.33	-26.34	-26.34	-26.34	-26.34	-26.34	-26.34	-26.34	-26.34	-26.34	-14.37	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
Tax Benefit	Rs Lakh	63.35	72.44	7.33	-5.70	-8.30	-8.82	-8.93	-8.95	-8.95	-8.95	-8.95	-8.95	-8.95	-8.95	-8.95	-8.95	-8.95	-4.88	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	0.00
Energy generation	MU	1.30	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
Discounting Factor		1.00	0.93	0.80	0.69	0.59	0.51	0.44	0.38	0.33	0.28	0.24	0.21	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	0.05	0.05	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	

Levelised benefit	0.57	Rs/Unit
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**Annexure – 2B
(above 5 MW to 25 MW)**



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

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Maharashtra
					above 5 MW to 25 MW
1	Power Generation	Capacity	Installed Power Generation Capacity Capacity Utilization Factor Auxiliary Consumption Deration Factor Useful Life	MW % % % Years	1 30% 1% 0.00% 35
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	453.53
3	Financial Assumption	<u>Debt: Equity</u> <u>Debt Component</u> <u>Equity Component</u>	Tariff Period Debt Equity Total Debt Amount Total Equity Amount Loan Amount Moratorium Period Repayment Period(incl Moratorium) Intrest Rate Equity amount Normative ROE (Post-tax) Return on Equity for first 10 years RoE Period Return on Equity 11th year onwards Weighted average of ROE Discount Rate (equiv. to WACC) 11th year onwards	Years % % Rs Lacs Rs Lacs Rs Lacs years years % Rs Lacs % % p.a Year % p.a % %	13 70% 30% 317 136 317 0 10 13.37% 136.06 16% 19% 10 24.00% 22.57% 16.13%
4	Financial Assumptions	<u>Economic Assumptions</u> <u>Fiscal Assumptions</u> <u>Depreciation</u>	Coal Price Escalation HSD Price Escalation Discount Rate Income Tax 80 IA benefits Depreciation Rate for first 10 years Depreciation Rate 11th year onwards Years for 7% rate	% p.a % p.a % p.a % Yes/No % % %	0 0% 0% 16% 0% 33.99% Yes 0.0% 7.00% 0.80% 10
5	Working Capital	<u>For Fixed Charges</u> O&M Charges Maintenance Spare Receivables for Debtors <u>For Variable Charges</u> Intrest On Working Capital	(% of O&M exepenses)	Months Months %	1 15% 2 12.87%
6	Operation & Maintenance	power plant (FY 10-11) <u>Total O & M Expenses Escalation</u>			12.69 5.72%



Form 1.2 Form Template for (>5 MW to 25 MW) : Determination of Tariff Component

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

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M Expenses	Rs Lakh		12.69	13.42	14.18	14.99	15.85	16.76	17.72	18.73	19.80	20.94	22.13	23.40	24.74	26.15	27.65	29.23	30.90	32.67	34.54	36.51	38.60	40.81	43.14	45.61	48.22	50.98	53.89	56.98	60.24	63.68	67.32	71.18	75.25	79.55	84.10
Depreciation	Rs Lakh		31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75
Interest on term loan	Rs Lakh		40.33	36.08	31.84	27.59	23.35	19.10	14.86	10.61	6.37	2.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		2.81	2.76	2.71	2.66	2.61	2.56	2.52	2.48	2.44	2.41	1.96	2.03	2.10	2.17	2.25	2.33	2.42	2.51	2.61	2.72	2.83	2.94	3.07	3.20	3.33	3.48	3.63	3.79	3.96	4.15	4.34	4.54	4.75	4.98	5.22
Return on Equity	Rs Lakh		25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85	25.85
Total Fixed Cost	Rs Lakh		113.43	109.86	106.33	102.84	99.41	96.02	92.69	89.42	86.21	83.07	80.37	78.11	76.12	74.61	73.48	72.84	72.60	72.76	73.33	74.41	76.00	78.21	81.04	84.50	88.69	93.61	99.28	105.82	113.24	121.54	130.72	140.79	151.75	163.60	

Levillised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levillised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
O&M expn	Rs/kWh		0.49	0.52	0.55	0.58	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	
Depreciation	Rs/kWh		1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	
Int. on term loan	Rs/kWh		1.55	1.39	1.22	1.06	0.90	0.73	0.57	0.41	0.24	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Int. on working capital	Rs/kWh		0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.12	0.12	0.13	0.13	0.14	0.15	0.16	0.17	0.17	0.18	0.19	0.20	0.21	0.22
RoE	Rs/kWh		0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	
Total CDG	Rs/kWh	3.65	4.36	4.22	4.09	3.95	3.82	3.69	3.56	3.44	3.31	3.19	3.23	3.37	3.43	3.48	3.54	3.61	3.68	3.75	3.82	3.90	3.99	4.08	4.17	4.27	4.38	4.49	4.61	4.73	4.86	4.99	5.13	5.27	5.42	5.57		

Discount Factor			1	0.861	0.741	0.638	0.550	0.473	0.408	0.351	0.302	0.260	0.224	0.193	0.166	0.143	0.123	0.106	0.091	0.079	0.068	0.058	0.050	0.043	0.037	0.032	0.028	0.024	0.020	0.018	0.015	0.013	0.011	0.010	0.008	0.007	0.006	
Levillised Tariff	3.65	Rs/Unit																																				



Determination of Accelerated Depreciation

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	60%
Income Tax (Normal Rates)	33.99%
Capital Cost	453.5

Years ----->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	11.97	23.95	23.95	23.95	23.95	23.95	23.95	23.95	23.95	23.95	23.95	23.95	23.95	23.95	23.95	23.95	23.95	13.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Depm.	Rs Lakh	181.41	217.69	43.54	8.71	1.74	0.35	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
Net Depreciation Benefit	Rs Lakh	169.44	193.75	19.59	-15.24	-22.20	-23.60	-23.88	-23.93	-23.94	-23.95	-23.95	-23.95	-23.95	-23.95	-23.95	-23.95	-13.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	57.59	65.85	6.66	-5.18	-7.55	-8.02	-8.12	-8.13	-8.14	-8.14	-8.14	-8.14	-8.14	-8.14	-8.14	-8.14	-4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	1.30	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
Discounting Factor		1.00	0.93	0.80	0.69	0.59	0.51	0.44	0.38	0.33	0.28	0.24	0.21	0.18	0.15	0.13	0.11	0.10	0.08	0.07	0.06	0.05	0.05	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01

Levellised benefit 0.51 Rs/Unit



**Annexure – 3
(Solar PV)**



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

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	19.0%	
			Deration Factor	%	0.0%	
			Useful Life	Years	25	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	1690	
3	Financial Assumptions		Tariff Period	Years	25	
			<u>Debt: Equity</u>			
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	1183	
			Total Equity Amout	Rs Lacs	507	
			<u>Debt Component</u>			
			Loan Amount	Rs Lacs	1183.00	
			Moratorium Period	years	0	
			Repayment Period(incld Moratorium)	years	10	
			Interest Rate	%	13.38%	
			<u>Equity Component</u>			
			Equity amount	Rs Lacs	507.00	
			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		15.97%				
4	Financial Assumptions	<u>Economic Assumptions</u>	Coal Price Escalation	% p.a	0%	
			HSD Price Escalation	% p.a	0%	
			Discount Rate	% p.a	15.97%	
			<u>Fiscal Assumptions</u>			
			Income Tax	%	33.99%	
			80 IA benefits	Yes/No	Yes	
			<u>Depreciation</u>			
			Depreciation Rate for first 10 years	%	7.00%	
			Depreciation Rate 11th year onwards	%	1.33%	
			Years for 7% rate		10	
5	Working Capital		<u>For Fixed Charges</u>			
			O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			<u>For Variable Charges</u>			
Interest On Working Capital	%	12.88%				
7	Operation & Maintenance		power plant (FY 10-11)	Rs Lacs	9.51	
			<u>Total O & M Expenses Escalation</u>	%	5.72%	



Form 1.2 Form Template for (Solar PV) - 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 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		9.51	10.05	10.63	11.24	11.88	12.56	13.28	14.04	14.84	15.69	16.59	17.54	18.54	19.60	20.72	21.90	23.16	24.48	25.88	27.36	28.93	30.58	32.33	34.18	36.14	
Depreciation	Rs Lakh		118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	118.30	
Interest on term loan	Rs Lakh		150.42	134.59	118.75	102.92	87.09	71.25	55.42	39.58	23.75	7.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capit	Rs Lakh		8.51	8.19	7.88	7.56	7.25	6.94	6.63	6.32	6.01	5.71	4.04	4.09	4.14	4.20	4.26	4.32	4.38	4.45	4.53	4.61	4.69	4.78	4.87	4.97	5.07	
Return on Equity	Rs Lakh		96.33	96.33	96.33	96.33	96.33	96.33	96.33	96.33	96.33	121.68	121.68	121.68	121.68	121.68	121.68	121.68	121.68	121.68	121.68	121.68	121.68	121.68	121.68	121.68	121.68	
Total Fixed Cost	Rs Lakh		383.07	367.47	351.89	336.35	320.84	305.38	289.95	274.57	259.23	243.95	164.84	165.84	166.89	168.01	169.19	170.44	171.76	173.15	174.62	176.18	177.83	179.57	181.41	183.36	185.42	

Levelised COG

Per Unit Cost of Generat	Unit	Levellise	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh		0.57	0.60	0.64	0.68	0.71	0.75	0.80	0.84	0.89	0.94	1.00	1.05	1.11	1.18	1.24	1.32	1.39	1.47	1.56	1.64	1.74	1.84	1.94	2.05	2.17
Depreciation	Rs/kWh		7.11	7.11	7.11	7.11	7.11	7.11	7.11	7.11	7.11	7.11	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
Int. on term loan	Rs/kWh		9.04	8.09	7.13	6.18	5.23	4.28	3.33	2.38	1.43	0.48	0.00	0.00	0.00	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		0.51	0.49	0.47	0.45	0.44	0.42	0.40	0.38	0.36	0.34	0.24	0.25	0.25	0.25	0.26	0.26	0.26	0.27	0.27	0.28	0.28	0.29	0.29	0.30	0.30
RoE	Rs/kWh		5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31
Total COG	Rs/kWh	17.91	23.02	22.08	21.14	20.21	19.28	18.35	17.42	16.50	15.58	14.66	9.90	9.96	10.03	10.09	10.17	10.24	10.32	10.40	10.49	10.59	10.68	10.79	10.90	11.02	11.14

Discount Factor			1	0.862	0.744	0.641	0.553	0.477	0.411	0.354	0.306	0.264	0.227	0.196	0.169	0.146	0.126	0.108	0.093	0.081	0.069	0.060	0.052	0.045	0.038	0.033	0.029
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Levelised Tariff 17.91 Rs/Unit

Determination of Accelerated Depreciation Benefit for Solar PV Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	33.99%
Capital Cost	1690.0

Years ----->	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
Book Depreciation		2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%	
Book Depreciation	Rs Lakh	44.62	89.23	89.23	89.23	89.23	89.23	89.23	89.23	89.23	89.23	89.23	89.23	89.23	89.23	89.23	89.23	89.23	89.23	89.23	48.67	0.00	0.00

Accelerated Depreciation

	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Opening	%																									
Allowed during the year	%		40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%		60%	12%	2.40%	0.48%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh		676.00	811.20	162.24	32.45	6.49	1.30	0.26	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

Net Depreciation Benefit	Rs Lakh	631.38	721.97	73.01	-56.78	-82.74	-87.93	-88.97	-89.18	-89.22	-89.23	-89.23	-89.23	-89.23	-89.23	-89.23	-89.23	-89.23	-89.23	-89.23	-48.67	0.00	0.00		
Tax Benefit	Rs Lakh	214.61	245.40	24.82	-19.30	-28.12	-29.89	-30.24	-30.31	-30.33	-30.33	-30.33	-30.33	-30.33	-30.33	-30.33	-30.33	-30.33	-30.33	-30.33	-16.54	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
Discounting Factor		1.00	0.93	0.80	0.69	0.60	0.51	0.44	0.38	0.33	0.28	0.24	0.21	0.18	0.16	0.14	0.12	0.10	0.09	0.07	0.07	0.07	0.07	0.07	0.07

Levelised benefit 2.96 Rs/Unit



**Annexure – 4
(Solar thermal)**



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

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	23.0%
			Auxiliary Consumption Factor	%	10.0%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	1530
3	Sources of Fund		Tariff Period	Years	25
			<u>Debt: Equity</u>		
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	1071
			Total Equity Amount	Rs Lacs	459
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	1071.00
			Moratorium Period	years	0
			Repayment Period(incld Moratorium)	years	10
			Interest Rate	%	13.38%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	459.00
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		15.97%			
4	Financial Assumptions	<u>Economic Assumptions</u>	Coal Price Escalation	% p.a	0%
			HSD Price Escalation	% p.a	0%
			Discount Rate	% p.a	15.97%
			<u>Fiscal Assumptions</u>		
			Income Tax	%	33.99%
			80 IA benefits	Yes/No	Yes
			<u>Depreciation</u>		
			Depreciation Rate for first 10 years	%	7.00%
Depreciation Rate 11th year onwards	%	1.33%			
Years for 7% rate		10			
5	Working Capital	<u>For Fixed Charges</u>	O&M Charges	Months	1
			Maintenance Spare	(% of O&M exepenses)	15%
			Receivables for Debtors	Months	2
			<u>For Variable Charges</u>		
			Interest On Working Capital	%	12.88%
7	Operation & Maintenance		power plant (FY10-11)	Rs Lacs	13.74
			Total O & M Expenses Escalation	%	5.72%



Form 1.2 Form Template for (Solar Thermal) - 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		13.74	14.53	15.36	16.24	17.16	18.15	19.18	20.28	21.44	22.67	23.96	25.33	26.78	28.32	29.94	31.65	33.46	35.37	37.40	39.53	41.80	44.19	46.71	49.39	52.21
Depreciation	Rs Lakh		107.10	107.10	107.10	107.10	107.10	107.10	107.10	107.10	107.10	107.10	20.40	20.40	20.40	20.40	20.40	20.40	20.40	20.40	20.40	20.40	20.40	20.40	20.40	20.40	20.40
Interest on term loan	Rs Lakh		136.18	121.85	107.51	93.18	78.84	64.51	50.17	35.84	21.50	7.17	0.00	0.00	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		7.98	7.70	7.43	7.16	6.90	6.64	6.38	6.12	5.87	5.62	4.13	4.20	4.28	4.36	4.44	4.53	4.63	4.73	4.83	4.95	5.07	5.19	5.33	5.47	5.62
Return on Equity	Rs Lakh		87.21	87.21	87.21	87.21	87.21	87.21	87.21	87.21	87.21	87.21	110.16	110.16	110.16	110.16	110.16	110.16	110.16	110.16	110.16	110.16	110.16	110.16	110.16	110.16	
Total Fixed Cost	Rs Lakh		352.21	338.38	324.61	310.89	297.21	283.60	270.04	256.55	243.12	229.76	158.65	160.09	161.62	163.23	164.94	166.74	168.65	170.66	172.79	175.04	177.42	179.94	182.60	185.41	188.39

Levelised COG

Per Unit Cost of Generation	Unit	Levelised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh		0.76	0.80	0.85	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	2.30	2.44	2.58	2.72	2.88
Depreciation	Rs/kWh		5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	5.91	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	
Int. on term loan	Rs/kWh		7.51	6.72	5.93	5.14	4.35	3.56	2.77	1.98	1.19	0.40	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	
Int. on working capital	Rs/kWh		0.44	0.42	0.41	0.40	0.38	0.37	0.35	0.34	0.32	0.31	0.23	0.23	0.24	0.24	0.24	0.25	0.26	0.26	0.27	0.27	0.28	0.29	0.29	0.30	0.31
RoE	Rs/kWh		4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	6.08	6.08	6.08	6.08	6.08	6.08	6.08	6.08	6.08	6.08	6.08	6.08	6.08	6.08	6.08
Total COG	Rs/kWh	15.31	19.42	18.66	17.90	17.14	16.39	15.64	14.89	14.15	13.41	12.67	8.75	8.83	8.91	9.00	9.10	9.20	9.30	9.41	9.53	9.65	9.78	9.92	10.07	10.23	10.39

Levelised Tariff	15.31	Rs/Unit
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Determination of Accelerated Depreciation Benefit for Solar Thermal Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (Normal Rates)	33.99%
Capital Cost	1530.0

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	40.39	80.78	80.78	80.78	80.78	80.78	80.78	80.78	80.78	80.78	80.78	80.78	80.78	80.78	80.78	80.78	80.78	44.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	612.00	734.40	146.88	29.38	5.88	1.18	0.24	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	571.61	653.62	66.10	-51.41	-74.91	-79.61	-80.55	-80.74	-80.77	-80.78	-80.78	-80.78	-80.78	-80.78	-80.78	-80.78	-80.78	-44.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	194.29	222.16	22.47	-17.47	-25.46	-27.06	-27.38	-27.44	-27.46	-27.46	-27.46	-27.46	-27.46	-27.46	-27.46	-27.46	-27.46	-14.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	0.91	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
Discounting Factor		1.00	0.93	0.80	0.69	0.60	0.51	0.44	0.38	0.33	0.28	0.24	0.21	0.18	0.16	0.14	0.12	0.10	0.09	0.07	0.06	0.06	0.05	0.04	0.04	0.03

Levelised benefit	2.46	Rs/Unit
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Appendix-1

List of Stakeholders who submitted written/oral Comments/Suggestions

Sl. No	Organisation/ Individual
1	Shri Dwarkanath V. Iyer (Individual)
2	Rashtriya Chemicals & Fertilizer Ltd.
3	Arbutus Computers & Consultants P. Ltd.
4	Kay Power & Paper Ltd.
5	Indian Wind Energy Association
6	Welspun Renewables Energy Ltd.
7	Indian Renewable Energy Development Agency Ltd.
8	CLP Wind Farms (I) Private Limited
9	Ankur Scientific Energy Technologies Pvt. Ltd.
10	Indian Wind Turbine Manufacturers Association
11	Dodson Lindblom Hydro Power Private Limited
12	Maharashtra Biomass Energy Developers Association
13	Forbes & Company Limited
14	Maharashtra State Power Generation Company Ltd.
15	Acciona Energy India Pvt. Ltd.
16	Four Eyes Research (P.) Ltd.
17	India Energy
18	Akhil Bharatiya Grahak Saurakshan Samiti
19	Celerity Power Pvt. Ltd.
20	Vel Induction Hardenings
21	Shri Jude G Tandon (Individual)



List of participants of Public Hearing held on July 10, 2010

Sl. No	Name	Institution
1	Shri Ravindra Chavan	Vestas Wind Tech
2	Shri C P Vishwanathan	Kenersys India Pvt. Ltd.
3	Shri Deepak Saugraya	Kenersys India Pvt. Ltd.
4	Shri N G Nasu	Maharashtra State Electricity Distribution Company Ltd
5	Shri R G Sonwane	Maharashtra State Electricity Distribution Company Ltd
6	Shri Sandeep Singh	Gamesa Wind Turbines Pvt Ltd
7	Shri Ashish Tiwari	Indian Energy
8	Shri S Parvathinathan	Renewable Energy Developers Association of
9	Shri Jagadish F	Maharashtra Biomass Energy Developers Association
10	Shri Raksh Pal Abrol	Rahstriya Udhami Avem Upabhoktha Sangh
11	Shri Nishikant Narayan Bojne	All India Consumer Protection Committee
12	Shri Dhanorkar	Maharashtra State Power Generation Company Ltd
13	Shri Neeraj Singh	Regen Powertech Pvt Ltd
14	Shri Rahul Vikram	Regen Powertech Pvt Ltd
15	Shri Narayan R Salve	Maharashtra State Power Generation Company Ltd
16	Rajesh Peddu	Welspun Energy
17	Shri Dwarkanath V Iyer	Consultant
18	Shri H Subramanian	Celerity Power Pvt Ltd
19	Shri Gajjar G Khan	Dhiwal Ind. Ltd
20	Shri Rajesh Tiwari	Individual
21	Shri S S Suryawanshi	Cogen Association of India
22	Shri Kumar Chedda	India Energy
23	Shri Brajesh Kumar	CLP Power India
24	Shri S A Patil	Maharashtra Energy Development Agency
25	Shri Arvind Karandikar	Gokhale Institute of Politics & Economics
26	Shri Pramod Sadolikar	Gokhale Institute of Politics & Economics
27	Shri R R Kulkarni	Maharashtra State Power Generation Company Ltd



Sl. No	Name	Institution
28	Shri S P Shinde	Bajaj Finserv Limited
29	Shri J J Kokate	Bajaj Finserv Limited
30	Shri A Ranganath	Magma Fincorp
31	Shri A S Chawla	Maharashtra Biomass Energy Developers Association
32	Shri R S Sangle	Maharashtra State Electricity Distribution Company Ltd
33	Shri J V Torane	Maharashtra Energy Development Agency
34	Shri S R Patil	Maharashtra Energy Development Agency
35	Shri P C Diwakar	Maharashtra Energy Development Agency
36	Shri Amay Naik	Tata Power Company Ltd
37	Shri Hasan Wangde	Individual
38	Shri Wisso Esaj	Wisdom Power Solutions Pvt. Ltd
39	Smt Shruti Bhatiya	Vestas Wind Technology India
40	Shri G D Rane	Global Energy
41	Shri V S Kale	Maharashtra State Electricity Distribution Company Ltd
42	Shri J M Wadhonkar	Maharashtra Energy Development Agency
43	Shri Amol Dakat	Global Energy
44	Smt Anushka Sharda	Maharashtra Biomass Energy Developers Association
45	Smt P V Salurkhe	Maharashtra State Power Generation Company Ltd
46	Shri V K Rokade	Brihan Mumbai Electricity Supply and Transport
47	Shri N Ponrathnam	Vel Induction Hardenings
48	Shri R M Vaidya	Maharashtra State Power Generation Company Ltd
49	Shri Jude G Tandon	Individual
50	Shri Prateep Kumar	Indian Wind Energy Association
51	Shri G Srinivasa Rao	Reliance Infrastructure Pvt Ltd
52	Shri R Pruthi	Individual
53	Shri Sharan Jagtiani	Maharashtra Biomass Energy Developers Association
54	Shri Satya S Boyina	Maharashtra Biomass Energy Developers Association
55	Shri Nitin Mudholkar	Yash Agro Energy Ltd
56	Shri Satayjit	CRISIL



Sl. No	Name	Institution
57	Shri Razak Khatri	CRISIL
58	Shri Ramesh M P	Centre for Wind Energy Technology
59	Shri Rakesh Bodalia	GEPL
60	Shri Yayub Khan	Individual
61	Shri Firoz A G	Individual

