

**BEFORE THE JOINT ELECTRICITY REGULATORY COMMISSION
FOR THE STATE OF GOA AND UNION TERRITORIES**

FILING NO.: _____

CASE NO.: _____

IN THE MATTER

MERCK LIMITED,

Shiv Sagar Estate-A, Dr. Annie Besant Road,

Worli, Mumbai 400018..... Petitioner

AND

IN THE MATTER OF:

Petition for approval of Tariff and Agreement for supply of surplus power from biomass based captive power plant of Merck Limited to Electricity Department, Government of Goa, under Section 62 (1) (a) and 86 (1) (a), (b) & (e) of the Electricity Act, 2003

AND

IN THE MATTER OF:

**ELECTRICITY DEPARTMENT, GOVERNMENT OF GOA
VIDYUT BHAWAN, 3RD FLOOR,
PANAJI, GOA.....RESPONDENT**

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MERCK LIMITED (“The Petitioner”) RESPECTIVELY SUBMITS AS FOLLOWS:

1. Background

1.1. Company and Project Overview

- 1.1.1. Merck Limited is a leading company for innovative and top-quality high-tech products in the pharmaceutical and chemical sectors. Around 50,000 employees work in 66 countries to improve the quality of life for patients, to further the success of customers and to help meet global challenges. Merck is the world's oldest pharmaceutical and chemical company. Since 1668 Merck's name has stood for innovation, business success and responsible entrepreneurship. The founding family remains the majority owner of the company to this day.
- 1.1.2. Merck Limited (formerly E. Merck Limited) was set up in India as Merck's first Asian subsidiary in 1967. The Company operates both its pharmaceuticals and chemicals businesses in the country. Merck India's manufacturing site located at Ponda, Goa commenced its operations in 1983. Spread across nearly 150,000 sq. m., it has facilities for pharmaceutical as well as chemical manufacturing.
- 1.1.3. Merck India has established a 3 MW Biomass based captive power plant at its plant site in Goa to meet the power demand of its operations and after meeting the power demand for manufacturing purposes there is still some surplus power available with us.

1.2. Project Description

- 1.2.1. MERCK has set up a modern 3 MW power project based on biomass fuel. The project will consume available cashew shells, Biomass Briquettes, Rice husk, coconut shells etc. as fuel for generation of steam and use it to generate electricity thereof. **This is the first biomass based project in the State of Goa and a step towards commitment to reduce emissions with more clean energy in the system.**
-

1.2.2. The power will be produced by operating a 3 MW steam turbine with alternator. Major equipment's of the power project under implementation comprises of 20 tonnes per hour (Tph) capacity Boiler with the outlet steam parameters of 66 Kg/Cm² and 485°C and the 3 MW capacity turbo-generator. The captive power plant has achieved commercial operation in November 2014 and is generating power since November 2014.

1.3. Location of the Project

1.3.1. The project location is at the existing facilities Merck Limited spread across nearly 150,000 sq. m. Site located at Marvasodo, Usgaon, Ponda District, State of Goa. The geographical location the power plant is detailed below:



Figure 1: Location of Biomass Based Captive Power Plant of Merck Limited

1.4. Supply of Surplus Power to EDG

1.4.1. For supplying surplus power to Electricity Department, Government of Goa (EDG), MERCK approached the EDG and submitted its proposal for the same. EDG vide its letter dated 7 August, 2015 (copy enclosed at Annexure-1) communicated that the rate proposed in the proposal submitted by MERCK and draft Agreement for supply of power may kindly be got approved by Hon'ble Joint Electricity Regulatory Commission. With this background,

MERCK Limited requests Hon'ble Joint Electricity Regulatory Commission to approve the tariff and Draft Agreement in this regard for supply the surplus power available from its Biomass based captive power plant to the Electricity Department, Government of Goa (EDG).

- 1.4.2. The purchase of surplus power from the captive power plant will help Electricity Department, Government of Goa to reduce the demand and supply gap of electricity. The purchase of surplus power will also help Electricity Department, Government of Goa in achieving its target of Renewable Purchase Obligations as discussed in the subsequent sections of this Petition.
- 1.4.3. The details related to the Capital cost and other parameters for computations of Fixed Charges and Energy Charge are given in the various Sections of this Petition.

1.5. Evacuation Arrangements

- 1.5.1. MERCK is already having an electricity Connection under category 'Industrial Connection HT-1' with the Electricity Department, Government of Goa for availing the power for its manufacturing facilities. For availing power from Electricity Department, Government of Goa under this Industrial Connection, a 7 kms long 33 kV transmission line is already installed from the PONDA/AMONA Substation to the existing substation of Merck Limited. This transmission line can be used for further import and export of power to and from the captive power plant. The schematic diagram of the evacuation arrangements from the captive power plant to the PONDA/AMONA Substation is enclosed as **Annexure 2**.

2. Approach to filing of the Petition

2.1. Background and procedural history

- 2.1.1. In this regard, MERCK approached the Electricity Department, Government of Goa (EDG) for supply of surplus power and submitted its proposal for the same. EDG vide its letter dated 7 August, 2015 (copy enclosed at Annexure-1) communicated that the rate proposed in the proposal submitted by MERCK and draft Agreement for supply of power may kindly be got approved by Hon'ble Joint Electricity Regulatory Commission. With this background, MERCK Limited requests Hon'ble Joint Electricity Regulatory Commission to
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approve the tariff and Draft Agreement in this regard for supply the surplus power available from its Biomass based captive power plant to the Electricity Department, Government of Goa (EDG).

2.1.2. The purchase of surplus power from the captive power plant will help Electricity Department, Government of Goa to reduce the demand and supply gap of electricity. The purchase of surplus power will also help Electricity Department, Government of Goa in achieving its target of Renewable Purchase Obligations as discussed in the subsequent chapters of this Petition.

2.2. Regulatory Provisions of Hon'ble Joint Electricity Regulatory Commission for the State of Goa and Union Territories on Renewable Purchase Obligation

2.2.1. The Regulation 1 (1.1) of the JERC (Procurement of Renewable Energy) Regulations, 2010, stipulates that a distribution licensee is required to purchase a certain quantum of power from renewable energy sources which is termed as Renewable Purchase Obligation. The Relevant extract of the Regulations are reproduced below:

"1. Quantum of Renewable Purchase Obligation (RPO)

(1.1) Each distribution licensee shall purchase electricity (in kWh) from renewable energy sources, at a defined minimum percentage of the total consumption of all the consumers in its area during a year. The defined minimum percentages are given below in the Table-1.

Year	Minimum quantum of purchase (in %) from renewable energy sources (in kWh)		
	Total	Solar	Non-Solar
2010-11	1%	0.25%	0.75%
2011-12	2%	0.30%	1.70%
2012-13	3%	0.40%	2.60%

(1.2) The RPO specified in the financial year 2012-13 shall be continued beyond 2012-13 till any revision is effected by the Commission in this regard."

2.2.2. The Hon'ble Joint Electricity Regulatory Commission for the State of Goa and Union Territories has initiated the process of amendment of the JERC (Procurement of Renewable Energy) Regulations, 2010 on January 02, 2014. The Renewable Purchase Obligations as stipulated in the draft amendment are as shown below:

Table 1: RPO as per draft amendment of the JERC (Procurement of Renewable Energy) Regulations, 2010

Financial Year	Minimum Quantum of Renewable Purchase Obligation of (RPO) of Renewable Energy (In kWh)		
	Total RPO (%)	Solar RPO (%)	Non-Solar RPO (%)
2010-11	1.00	0.25	0.75
2011-12	2.00	0.30	1.70
2012-13	3.00	0.40	2.60
2013-14	3.00	0.40	2.60
2014-15	3.30	0.60	2.70
2015-16	3.55	0.85	2.70
2016-17	3.95	1.15	2.80
2017-18	4.30	1.50	2.80
2018-19	4.65	1.85	2.80
2019-20	5.10	2.20	2.90
2020-21	5.50	2.60	2.90
2021-22	6.00	3.00	3.00

2.2.3. The Electricity Department, Government of Goa in its petition for Retail Supply Tariff for FY 2014-15 to the Hon'ble Joint Electricity Regulatory Commission for the State of Goa and Union Territories, submitted that it is meeting all its targets of Renewable Purchase Obligation through the coke-oven based Co-generation plants of GEPL, GSPL and Sesa Goa Ltd.

2.2.4. However, the Hon'ble Joint Electricity Regulatory Commission for the State of Goa and Union Territories in the Retail Supply Tariff for FY 2014-15 for Electricity Department, Government of Goa has stipulated that the power availed by the Department through the Co-generation plants are fossil fuel

based which cannot be considered under RE sources. The relevant extract from the Retails Supply Tariff Order is reproduced below:

“Renewable Energy Obligation

...

The Commission has floated the draft amendments to the JERC (Procurement of Renewable Energy) Regulations; 2010 for comments. The Commission has finalized the amendment and sent the same for publication to Controller of Publications, Ministry of Urban Development on February 20, 2013. In the finalized petition, the Commission has amended the definition of Renewable Energy Sources under Regulation 2 (p) as follows:

Quote”

“Renewable Energy Sources” means Electricity generating sources recognized or approved by the Ministry of New and Renewable Energy and includes bundled power purchase (to the extent of Renewable Energy content in the bundled Power), power generated from co-generation based power plant wherein the fuel used is non-fossil fuel duly recognized as renewable sources by MNRE and certified by the State accredited agency.

“Unquote

The Commission has considered the above finalized regulations pending notification of the amendments. The power availed by ED-Goa through the co-generation plants are fossil fuel based which cannot be considered under RE sources. Therefore, the Commission has considered the RPO obligation through REC certificates at Rs 4.00 and Rs 9.00 per unit for non-solar and solar respectively. However, the Petitioner can explore alternatives for fulfillment of RPO that would be considered at the time of true up.”

- 2.2.5. As per the Retail Supply Tariff of the Hon’ble Joint Electricity Regulatory Commission for the State of Goa and Union Territories, the Electricity Department, Government of Goa, should explore alternatives for fulfilment of RPO.
- 2.2.6. MERCK takes this as an opportunity as the Biomass based Captive Power Plant set up is a renewable energy power project as per the Regulation 2(v) of the CERC (Terms and Conditions for Tariff Determination from Renewable
-

Energy Sources) Regulations, 2012 which defines Biomass power plants as renewable source of energy. The relevant extract from the Regulations is reproduced below:

“2. Definitions

...

v) ‘Renewable Energy Sources’ means renewable sources such as small hydro, wind, solar including its integration with combined cycle, biomass, bio fuel cogeneration, urban or municipal waste and other such sources as approved by the MNRE”

2.2.7. Therefore, the purchase of power from the Biomass Based Captive Power Plant of Merck Limited will not only help the Electricity Department, Government of Goa in meeting its ever increasing Demand but also in meeting its targets for Renewable Purchase Obligations.

2.2.8. Considering the demand-supply position in the State of Goa, this plant will help the State as the power earlier availed by MERCK for its operations in Goa will be met through this Captive power plant thus making around 2 to 2.3 MW of the load and around 12.36 MU of energy per annum available for other consumers of the State. Further, whenever available the surplus energy of around 6 MU will be available to the State for meeting the energy requirement.

2.3. Regulatory Provisions of Hon’ble Central Electricity Regulatory Commission

2.3.1. The Hon’ble Central Electricity Regulatory Commission notified the CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2012 on February 06, 2012.

2.3.2. Further, the Hon’ble Central Electricity Regulatory Commission has amended the CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2012 vide its notification dated March 18, 2014. In the said amendment, various assumptions with respect to operational performance parameters of the power plant, project costs etc. have been amended. The Table shown below provides the salient features of CERC Renewable Energy Tariff Regulations, 2014 Regulations:

Table 2: Key Provisions of CERC Renewable Energy Tariff Regulations, 2014

Particulars	CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2014
Capital Cost	<p>Water Cooled Condenser: -Rice Straw and Juliflora: Rs. 590 Lakh/MW -Others: Rs. 540 Lakh/MW</p> <p>Air Cooled Condenser: -Rice Straw and Juliflora: Rs. 630 Lakh/MW -Others: Rs. 580 Lakh/MW</p>
Auxiliary Consumption	<p>Water Cooled Condenser: During First Year of Operation: 11% From 2nd Year onwards: 10%</p> <p>Air Cooled Condenser: During First Year of Operation: 13% From 2nd Year onwards: 12%</p>
Station Heat Rate	Travelling Grate Boilers: 4200 kCal/kWh AFBC Boilers: 4125 kCal/kWh
O&M Expenses	Rs. 40 Lakh (FY 2013-14) Escalation: 5.72%
Calorific Value	GCV: 3100 kCal/Kg
Use of Fossil Fuel in Biomass Power Plants	Use of fossil fuels shall not be allowed
Biomass Price	Following provision added: <i>“Alternatively, biomass fuel price shall be decided annually by the appropriate Regulatory Commission through an independent survey which could be carried out by constituting a State level committee consisting of representatives of State Nodal Agency, State Government, Distribution Licensees, biomass power producers association and any other organization.”</i>

2.3.3. On May 15, 2014 the Hon'ble CERC notified the final Tariff Order for generic levelled generation tariff for renewable energy sources for FY 2014-15. As per the above mentioned Tariff Order, the applicable tariff rate for FY 2014-15 for the Biomass Power Projects situated in the other States and utilizing fuel other than Rice Straw and Juliflora (plantation) is **Rs. 7.42 /kWh**. (A copy of CERC Order dated May 15, 2014 is enclosed herewith at **Annexure-3**.)

3. Operational performance

3.1. Assessment of surplus power

3.1.1. The maximum demand for the manufacturing Unit of the Merck Limited at the Goa site for FY 2013-14 has been around 2.28 MW as shown in the graph below:

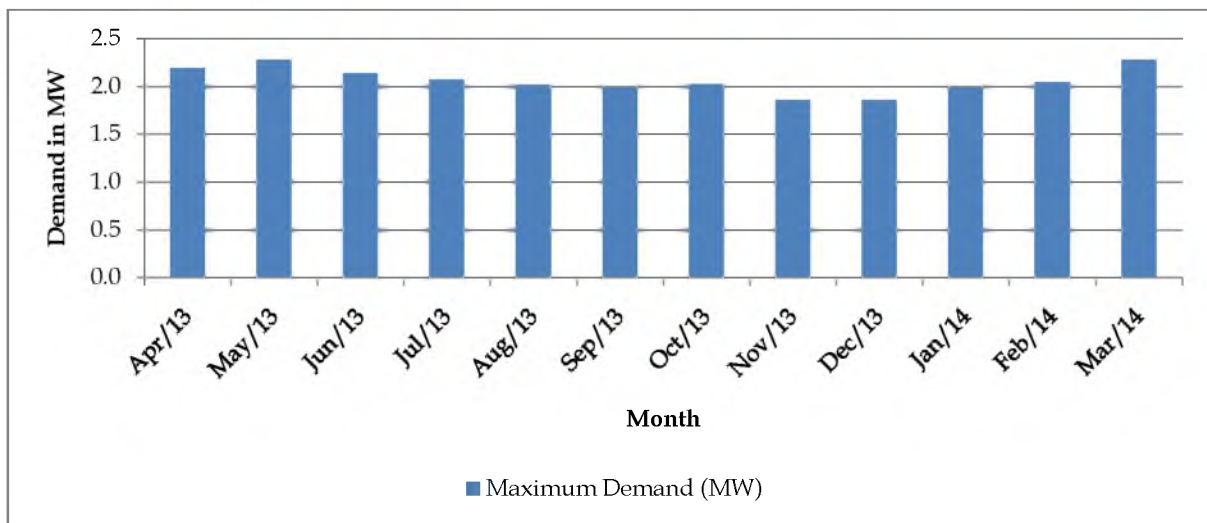


Figure 2: Month-Wise Maximum Demand of Merck Limited.

3.1.2. The energy consumption for the manufacturing Unit of the Merck Limited at the Goa site for FY 2013-14 has been around 12.36 MU as shown in the graph below:

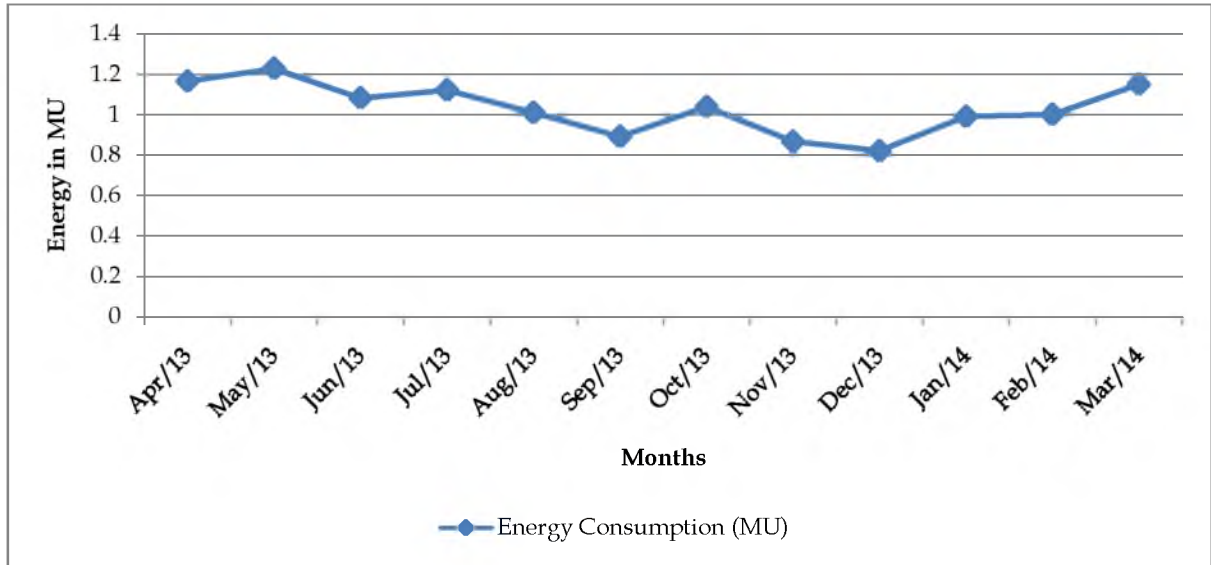


Figure 3: Month-wise Energy Consumption of Merck Limited.

3.1.3. Accordingly, the surplus power available with the Merck Limited for supply to EDG is around 6.14 MU per annum as shown in table below:

Table 3: Assessment of Available Surplus Power

S. No.	Parameter	Units	Value
A	Installed Capacity	MW	3.00
B	Gross Power Generation	MU per annum	21.02
C	Auxiliary Consumption (12 %)	MU per annum	2.52
D=B-C	Net Power Generation	MU per annum	18.50
E	Captive Energy Requirement	MU per annum	12.36
F=D-E	Surplus Power Available for supply to EDG	MU per annum	6.14

4. Determination of tariff

4.1. Overall Approach for Determining Generation Tariff

4.1.1. The Petitioner submits that as per the approach for determining generation tariff, the total cost of generation has been segregated into two parts, a fixed cost and a variable cost. The approach to determining both these cost components for the entire 3 MW plant have been submitted below.

4.2. Determination of fixed costs

4.2.1. Capital Cost

4.2.1.1. The Capital cost for the project is Rs. 23.90 Crore which is completely funded through equity. Accordingly, the Per MW Capital cost of the project works out to be around Rs. 7.97 Crore/MW.

4.2.1.2. As per the CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2014, the Capital cost of the biomass power projects based on the Rankine cycle, having water cooled condenser and operating with the fuels other than rice straw and juliflora (plantation) is Rs. 5.40 Crore/MW.

4.2.1.3. As compared to the approved Capital Cost Rs. 5.40 Crore/MW, the actual Capital Cost of Rs. 7.97 Crore/MW appears to be on the higher side. However, it needs to be pointed out that the Capital Cost of the biomass based power plant remains almost similar for the small sized power plants ranging from 3-5 MW and larger sized power plants ranging from 15-25 MW. This is primarily due to the fact that the Establishment cost, Civil Works Cost and other various packages for the both the small and large biomass based power plants is almost same. Therefore, the capital cost of the 3 MW biomass based power plant cannot be compared with the capital cost of the 25 MW biomass based power plant. The capital cost of the project is as summarised below:

Table 4: Break-up of Capital Cost

S. No.	Description	Amount (Rs. Crore)
1	Land	
2	Site Development	1.00
3	Plant & Machinery	17.35
4	Civil Works	5.00
5	Transmission System	0.00
6	Development and Pre-operative Expenses	0.55
7	IDC and Financing Charges	NA
	Total	23.90

4.2.1.4. Further, the Capital Cost of the Plant is higher as the plant has been designed with very high safety parameters in line with the overall philosophy of MERCK Group. Further, no compromise was made on the quality aspects of the equipment to ensure continuous operation of the plant without much interruptions.

4.2.2. Interest on Loan

4.2.2.1. As per the CERC Renewable Energy Tariff Regulations, 2012 the interest on loan shall be calculated on a normative basis as prescribed in Clause 14 of the said regulations.

“14. Loan and Finance Charges

(1) Loan Tenure.

For the purpose of determination of tariff, loan tenure of 10 years shall be considered.

(2) Interest Rate

(a) The loans arrived at in the manner indicated in the Regulation 13 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.

(b) For the purpose of computation of tariff, the normative interest rate shall be considered as average State Bank of India (SBI) Base rate prevalent during the first six months of the previous year plus 300 basis points.

(c) 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..”

4.2.2.2. The Petitioner does not have any borrowed capital, however, considering the provisions of the CERC regulation, normative loans have been worked out and interest has been calculated on the loan amount for each year in accordance with the methodology prescribed by CERC. The repayment of loan has been considered equal to the depreciation during the year and is it is considered that the loan shall be repaid within the 12 years of commercial operation of the project. The rate of interest on loan has been considered equal to the actual average SBI base rate during the first six month of the previous year plus 300 basis points. The average SBI base rate of 9.7% during the first six months of FY 2013-14 has been used for projection of interest expenses in the future years. The table below contains the calculation of interest on debt for each year.

Table 5: Interest on Loan (Rs. Crore)

Particulars	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Opening Balance	16.73	15.34	13.94	12.55	11.15	9.76	8.37	6.97	5.58	4.18	2.79	1.40
Add. Cap.	0	0	0	0	0	0	0	0	0	0	0	0
Repayment	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39
Closing Balance	15.34	13.94	12.55	11.15	9.76	8.37	6.97	5.58	4.18	2.79	1.40	0.00
Interest Rate	12.70%	12.70%	12.70%	12.70%	12.70%	12.70%	12.70%	12.70%	12.70%	12.70%	12.70%	12.70%
Interest on Loan	2.036	1.8591	1.6821	1.5050	1.3280	1.1509	0.9739	0.7968	0.6198	0.4427	0.2657	0.0886

Particulars	Unit	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY
		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Depreciation	Rs. Crore	1.39	1.39	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60

4.2.5. Operation and Maintenance (O&M) Expenses

4.2.5.1. Based on the actual operations till date, the estimated Operation and Maintenance expenses per annum are likely to be around Rs 3.34 Crore, however, for tariff computations purpose, the O&M expenses as per the CERC Renewable Energy Tariff Regulations, 2012, as amended from time to time have been considered. The allowed expenses for the first year are then escalated at a specified escalation rate of 5.72%. The Petitioner has calculated the O&M expenses using a similar methodology. The O&M expenses for the first complete year of operation i.e. FY 2014-15 have been taken as Rs. 40 Lakh/MW i.e., the base expenses for projection of O&M expenses for the remaining part of the tariff period. Therefore, the O&M computed as per the norms prescribed by CERC, is shown below:

Table 9: Operation and Maintenance (O&M) expenses (Rs. Crore)

Particulars	Unit	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
O&M Expenses	Rs. Crore	1.27	1.34	1.42	1.50	1.58	1.68	1.77	1.87	1.98	2.09

Particulars	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
O&M Expenses	2.21	2.34	2.47	2.61	2.76	2.92	3.09	3.27	3.45	3.65

4.2.6. Interest on Working Capital

4.2.6.1. The formula for working capital has been given by the Petitioner in Regulation 17 (2) of CERC Tariff Regulations as given below:

- a) Fuel costs for four months equivalent to normative PLF;
- b) Operation & Maintenance expense for one month;

c) Receivables equivalent to 2 (Two) months of fixed and variable charges for sale of electricity calculated on the target PLF;

d) Maintenance spare @ 15% of operation and maintenance expenses

4.2.6.2. The interest on working capital has been calculated at interest rate equivalent to average State Bank of India base rate during the first six months of the previous year plus 350 basis points. The interest on working capital computed as per the norms prescribed by CERC, is shown in the Table below:

Table 10: Interest on working capital expenses (Rs. Crore)

Particulars	Unit	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
O&M Expenses	Rs. Crore	0.11	0.11	0.12	0.12	0.13	0.14	0.15	0.16	0.16	0.17
Biomass Stock	Rs. Crore	1.18	1.27	1.36	1.45	1.55	1.67	1.78	1.90	2.03	2.18
Maintenance Spares	Rs. Crore	0.19	0.20	0.21	0.22	0.24	0.25	0.27	0.28	0.30	0.31
Receivables	Rs. Crore	3.50	3.66	3.82	4.00	4.20	4.42	4.63	4.88	5.14	5.44
Total Working Capital	Rs. Crore	4.98	5.25	5.51	5.80	6.12	6.47	6.82	7.22	7.64	8.11
Interest Rate	%	13.20%	13.20%	13.20%	13.20%	13.20%	13.20%	13.20%	13.20%	13.20%	13.20%
Interest on Working Capital	Rs. Crore	0.66	0.69	0.73	0.77	0.81	0.85	0.90	0.95	1.01	1.07

Particulars	Unit	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY
		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
O&M Expenses	Rs. Crore	0.18	0.19	0.21	0.22	0.23	0.24	0.26	0.27	0.29	0.30
Biomass Stock	Rs. Crore	2.33	2.49	2.67	2.86	3.05	3.27	3.50	3.75	4.00	4.28
Maintenance Spares	Rs. Crore	0.33	0.35	0.37	0.39	0.41	0.44	0.46	0.49	0.52	0.55
Receivables	Rs. Crore	5.78	6.11	6.34	6.77	7.19	7.66	8.17	8.72	9.28	9.89
Total Working Capital	Rs. Crore	8.63	9.15	9.59	10.24	10.89	11.61	12.38	13.24	14.09	15.03
Interest Rate	%	13.20%	13.20%	13.20%	13.20%	13.20%	13.20%	13.20%	13.20%	13.20%	13.20%
Interest on Working Capital	Rs. Crore	1.14	1.21	1.27	1.35	1.44	1.53	1.63	1.75	1.86	1.98

The table on the following page contains the calculation of fixed cost:

Table 11: Calculation of fixed cost (Rs. Crore)

Fixed Charges																					
Particulars	Unit	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
O&M Expenses	Rs. Crore	1.2686	1.34	1.42	1.50	1.58	1.68	1.77	1.87	1.98	2.09	2.21	2.34	2.47	2.61	2.76	2.92	3.09	3.27	3.45	3.65
Depreciation	Rs. Crore	1.3941	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Interest on term loan	Rs. Crore	2.0362	1.86	1.68	1.51	1.33	1.15	0.97	0.80	0.62	0.44	0.27	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs. Crore	0.6574	0.69	0.73	0.77	0.81	0.85	0.90	0.95	1.01	1.07	1.14	1.21	1.27	1.35	1.44	1.53	1.63	1.75	1.86	1.98
Return on Equity	Rs. Crore	1.4340	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
Total Fixed Cost	Rs. Crore	6.79	6.72	6.66	6.60	6.55	6.51	6.47	6.45	6.44	6.43	6.73	6.75	6.06	6.29	6.52	6.77	7.04	7.33	7.63	7.95
Per Unit Fixed Cost	Rs./kWh	3.67	3.62	3.60	3.57	3.54	3.51	3.50	3.49	3.48	3.47	3.64	3.65	3.27	3.39	3.52	3.66	3.81	3.95	4.12	4.30

4.3. Determination of Variable costs

4.3.1. MERCK is presently purchasing the three types of biomass fuel i.e., briquettes, rice husks and Cashew Shell at average price of around Rs. 5530/MT with the average gross calorific value of around 3436 kCal/kg. The summary of fuel mix currently being utilised with the landed cost including transportation and unloading is given in Table below:

Table 12: Fuel mix with the landed cost including transportation and unloading

Sr.No.	Fuel Mix	% of Fuel Mixing combinations	Fuel Cost (Rs/MT) as per Purchase Order Terms including Transport & unloading
1	Briquettes	38%	6120.00
2	Rice Husk	10%	3927.00
3	Cashew Shell	52%	5406.00
Average Cost			5530

4.3.2. It may please be appreciated that the landed price of biomass in the State of Goa is higher as compared to other States as biomass in adequate quantity is not available in the State of Goa and hence the same has to be procured from outside the State, which significantly increases the transportation cost and hence the landed cost of the biomass fuel. Further, the labour cost in the State of Goa is also higher as compared to other States due to which the fuel unloading cost is also higher.

4.3.3. It may please be noted that though the biomass price is higher as compared to biomass price considered by CERC while determining the tariff for Biomass based plants but at the same time, the actual weighted average gross calorific value of biomass being used is also on higher side i.e., 3436 kCal/kg as against 3100 kCal/kg considered by CERC in its Order.

4.3.4. Merck has considered the fuel price of Rs 5530/MT equivalent to average fuel price of fuel being procured currently and gross calorific value of 3436 kCal/kg. Further, based on past trends of biomass price in the State of Goa, an

annual escalation of 7% has been assumed while projecting the biomass prices for future years. Merck Limited would like to submit that any variation in tariff due to variation in fuel price and calorific value shall be allowed to be adjusted based on actual fuel price and calorific value as the same is uncontrollable for Merck Limited.

4.3.5. At this stage, through the actual Heat Rate being achieved is around 4800 kCal/kWh, but Merck Limited, will try to achieve the normative Heat Rate of 4200 kCal/KWh as per CERC Regulations and the same has been considered for computations of tariff.

4.3.6. The calculation of variable cost is shown in the Table below:

Table 13: Calculation of variable cost (Rs. Crore)

Particulars	Unit	FY	FY	FY
		2016	2017	2018
Days of Operation		366.00	365.00	365.00
Gross Generation (MU)	MU	21.08	21.02	21.02
Auxiliary Consumption (MU)	MU	2.53	2.52	2.52
Net Generation (MU)	MU	18.55	18.50	18.50
Input Energy Required	Million kCal	88,542.72	88,300.80	88,300.80
Biomass Consumption	Million Kg	25.77	25.70	25.70
Biomass Cost	Rs. Crore	14.25	15.21	16.27
Variable charges/per unit (Rs per unit)	Rs./kWh	7.68	8.22	8.79

4.4. Total Tariff

4.4.1. Based on above assumptions and considering the Capital cost of Rs. 23.90 Crore and biomass price of Rs. 5530/MT the levelised fixed charges for 20 years work out to be Rs. 3.59/kWh at discounting rate of 10.81% and variable charges for first year of operations works out to be Rs. 7.68/kWh. Accordingly, the applicable tariff for first year works out to be Rs. 11.27/kWh. The Petitioner requests the Hon'ble Commission to approve tariff for first three years from the biomass based captive power plant of Merck Limited as shown in Table below:

Table 14: Tariff for FY 2014-15 to FY 2016-17

Particulars	Unit	FY 2014-15	FY 2015-16	FY 2016-17
Variable Charge	Rs./kWh	7.68	8.22	8.79
Levelised Fixed Charge	Rs./kWh	3.59	3.59	3.59
Applicable Tariff	Rs./kWh	11.27	11.81	12.38

5. Draft Agreement for Approval

5.1. The draft Agreement for supply of power between Merck Limited and Electricity Department, Government of Goa has been prepared in accordance with the Power Purchase Agreement as approved by the Hon'ble Joint Electricity Regulatory Commission for the State of Goa and Union Territories for purchase of power by Electricity Department, Government of Goa from captive power plant of Sesa Goa Limited. The draft Power Purchase Agreement is enclosed herewith at **Annexure-4**. The Salient features of the Draft Agreement are as given below:

- a. Merck Limited intends to utilise the electricity generated from the captive power plant for meeting its power requirement. In the event of any energy remaining after meeting the captive energy requirement of Merck Limited, such surplus energy shall be supplied to Electricity Department, Government of Goa. In the event Electricity Department, Government of Goa does not wish to procure this Surplus Energy, it shall communicate the same to Merck 3 (three) months in advance and in such case, Merck shall be allowed to sell the Surplus Energy to a third party purchaser. In the event Electricity Department, Government of Goa communicates to Merck that it does not intend to purchase the Surplus Energy in terms of the proposed Agreement, Merck shall have the right to sell the Surplus Energy to third party/parties within or outside the State of Goa and Electricity Department, Government of Goa shall allow Open Access, at distribution and transmission level subject to provisions of Joint Electricity Regulatory Commission for the State of Goa and Union Territories (Open Access in Transmission and Distribution) Regulations, 2009 and Joint Electricity Regulatory Commission (State Grid Code) Regulations, 2010.
 - b. Merck Limited shall comply with the provisions of the applicable law including, in particular, the State Grid Code as amended from time to time regarding operation and maintenance of the captive power plant and all matters incidental thereto. Further, Merck Limited shall be required to follow scheduling and dispatch schedules as per regulations of the Hon'ble Commission as may be issued from time to time.
 - c. The surplus energy available for sale to Electricity Department, Government of Goa is estimated at around 6.41 MU per annum. The tariff for sale of
-

energy to Electricity Department, Government of Goa shall be approved by the Hon'ble Commission from time to time.

- d. The Term of Agreement is proposed to be 10 (Ten) years from the Effective Date and unless terminated earlier, shall remain in full force upto the term. Upon expiry, the Parties may extend the duration of this Agreement on such terms and conditions and for such further period as the Parties may mutually agree or may replace this Agreement by another Agreement.

The Petitioner requests the Hon'ble Commission to kindly approve the Agreement.

6. Prayers to the Hon'ble Commission

6.1. The Petitioner respectfully prays that the Hon'ble Commission may:

- i. Accept the Petition for approval of Tariff and Power Purchase Agreement between Electricity Department, Govt. of Goa and MERCK Limited for supply of surplus power from biomass based captive power plant of MERCK Limited to Goa Electricity Department under Section 62 (1) (a) and 86 (1) (a), (b) & (e) of the Electricity Act, 2003;
- ii. Approve the Tariff for supply of surplus power from the Petitioner's Biomass based Captive Power Plant to EDG;
- iii. Approve the Power Purchase Agreement for supply of surplus power from the Petitioner's Biomass based Captive Power Plant to EDG;
- iv. Condone any inadvertent omissions, errors, short comings and permit MERCK to add/ change/ modify/alter this filing and make further submissions as may be required at a future date; and;
- v. Pass such other and further Orders as deemed fit and proper in the facts and circumstances of the case.

(DEPONENT)

ANNEXURE-1

**(Copy of Letter dated August 7,2015 from
Electricity Department, Govt. of Goa and
MERCK Limited)**

ANNEXURE-2

(Schematic diagram of the evacuation arrangements from the captive power plant to the PONDA/AMONA Substation)

ANNEXURE-3

**(Copy of CERC Order dated May 15,
2014)**

ANNEXURE-4

**(Draft Agreement between Electricity
Department, Govt. of Goa and MERCK
Limited for approval of Hon'ble
Commission)**

OFFICE OF THE CHIEF ELECTRICAL ENGINEER
ELECTRICITY DEPARTMENT
GOVERNMENT OF GOA
VIDYUT BHAVAN 3rd FLOOR
PANAJI - GOA

Contact No. 0832- 2224680, 2222354 /2426986(FAX)/Email ID: cee-elec.goa@nic.in

No 101/1/non-solar/CEE/Tech/2015-16/ 766

Dated: 7/8/2015

To,
Shri C.A. Menezes,(Director – Goa Plant)
Merck Limited,
Plot No 11/1, Marwasodo,
Usgaon- Ponda,
403407.
Fax – 832-6614112.

**Sub: Proposal for supply of surplus power from 3 MW biomass based
captive power plant.**

Ref: - No 101/1/solar/CEE/Tech/2014-15/1092 dated 18/12/2015.

Sir,

In continuation to this office letter cited above it is to inform that the rate proposed in the letter dated 28/03/2015 and draft agreement proposed vide letter dated 13/10/2014 may kindly be got approved from Hon'ble JERC.

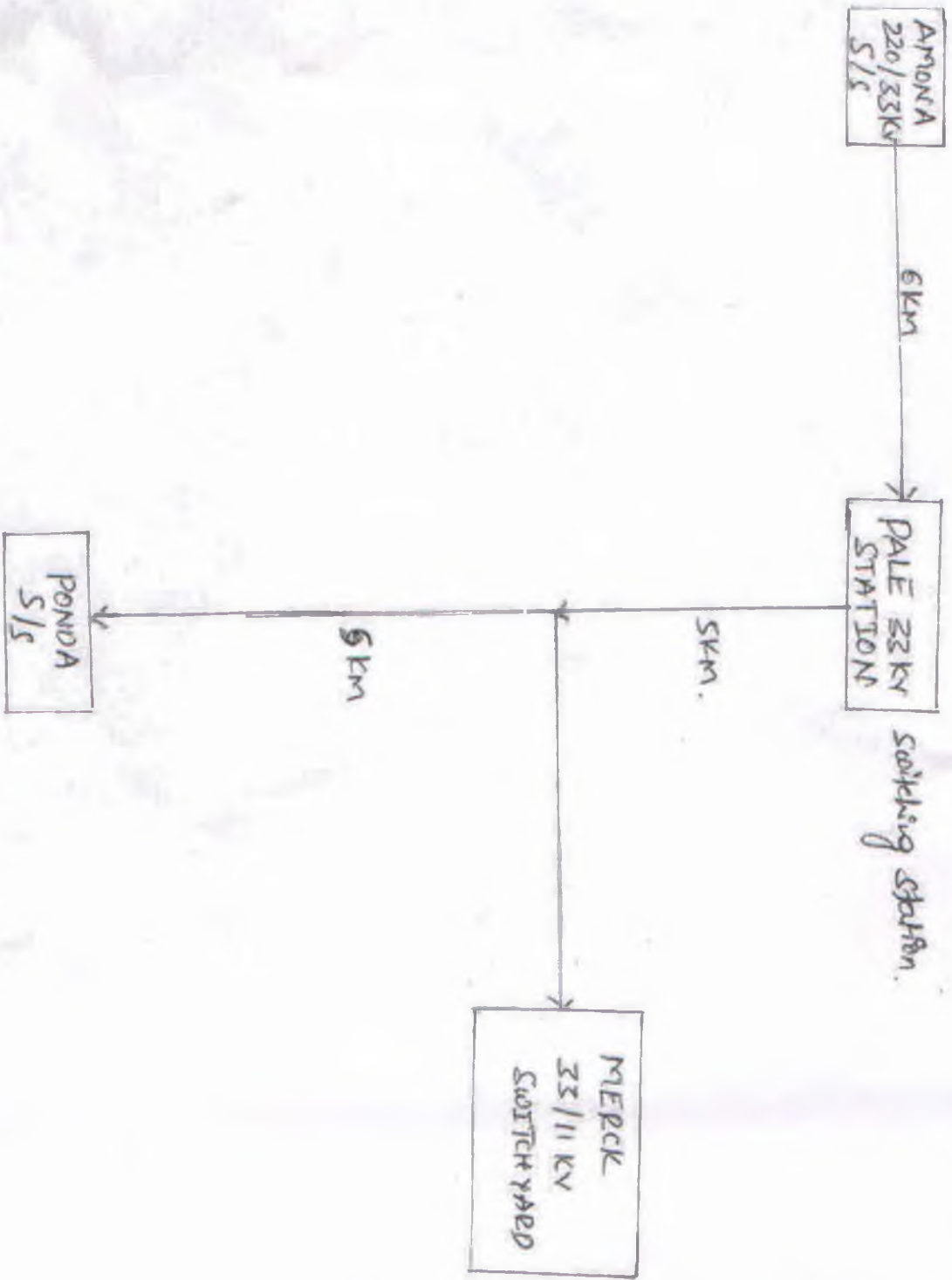
However, it may please be noted that the purchases will be done only after the approval of Government.

Your's faithfully,


(L.D.Kolvekar)
Chief Electrical Engineer

Annexure - 1

SINGLE LINE DIAGRAM OF 33 KV LINE



**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. SM/354/2013 (Suo-Motu)

**Coram: 1. Shri Gireesh B. Pradhan, Chairperson
2. Shri M. Deena Dayalan, Member
3. Shri A. K. Singhal, Member
4. Smt. Neerja Mathur, Member (Ex. Officio)**

Date of hearing: 11th March, 2014

Date of Order: 15th May, 2014

IN THE MATTER OF

Determination of generic levelled generation tariff for the FY 2014-15 under Regulation 8 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2012.

ORDER

1. The Commission has notified the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2012, on 06.02.2012 (hereinafter referred to as “the RE Tariff Regulations”), which provide for terms and conditions and the procedure for determination of tariff of the following categories of Renewable Energy (RE) generating stations:
 - (a) Wind Power Project;
 - (b) Small Hydro Projects;
 - (c) Biomass Power Projects with Rankine Cycle technology;
 - (d) Non-fossil fuel-based co-generation Plants;
 - (e) Solar Photo voltaic (PV);
 - (f) Solar Thermal Power Projects;
 - (g) Biomass Gasifier based Power Projects; and
 - (h) Biogas based Power Project.



2. The Commission, in the meanwhile, has notified the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) (First Amendment) Regulations, 2014 (hereinafter referred to as “the RE Tariff (First Amendment) Regulations”), on 18.03.2014, wherein, various technical norms of Biomass Power Projects with Rankine Cycle technology have been amended. These norms are effective from the notification of the First Amendment Regulations.
3. The Regulations enjoin upon the Commission to determine the generic tariff on the basis of the *suo-motu* petition, for the RE technologies for which norms have been provided in the RE Tariff Regulations. Generic Tariff is different from the project specific tariff for which a project developer has to file petition before the Commission as per the format provided in the RE Tariff Regulations. Pertinently, project specific tariff has been envisaged for the new RE technologies and the technologies which are still at the nascent stage of development, and the Commission shall determine the project specific tariff for such technologies on a case to case basis.
4. Clause (1) of Regulation 8 of the RE Tariff Regulations provides that “the Commission shall determine the generic tariff on the basis of *suo-motu* petition at least six months in advance at the beginning of each year of the Control period for renewable energy technologies for which norms have been specified under the Regulations”. The Commission has notified the RE Tariff Regulations on 06.02.2012 and subsequently issued generic *suo-motu* tariff orders, which were applicable for the renewable energy projects to be commissioned during first and second year of the control period (i.e. FY2012-13 and FY 2013-14). The Commission, in due discharge of the mandate under Regulation 8(1) of the RE Tariff Regulations has determined the generic tariff of the RE projects for the third year of control period (i.e. FY 2014-15) through this order.
5. The Commission issued Order proposing “Determination of generic levellised generation tariff for the FY2014-15 under Regulation 8 of the Central Electricity Regulatory



Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2012.” (Petition No. 354/SM/2013) dated 7th January, 2014 for inviting comments/suggestions/objections from the stakeholders. A Public Notice was issued on 8th January, 2014 for inviting comments/suggestions/objections. Last date of submission of comments/suggestions/objections was kept on 31st January, 2014.

6. In response to the same, written comments /suggestions/objections have been received from following stakeholders:

- i. M/s Rajasthan Biomass Power Developers Association
- ii. M/s Malwa Power Private Limited
- iii. M/s Punjab Biomass Power Limited
- iv. M/s IL&FS Energy Development Company Limited
- v. M/s Himshakti Private Limited
- vi. M/s Bermaco Energy Limited
- vii. M/s Sterling Agro Industries Limited
- viii. M/s A2Z Maintenance & Engineering Services limited
- ix. M/s Indian Biomass Power Association
- x. M/s Viaton Energy Private Limited.
- xi. M/s Green Planet Energy Private Limited
- xii. M/s DEE Piping Systems
- xiii. M/s Shalivahana Green Energy Limited
- xiv. M/s NSL Renewable Power Private Limited
- xv. M/s Indian Wind Turbine Manufacturers Association (IWTMA)
- xvi. M/s Indian Wind Power Association (IWPA)
- xvii. M/s JITF Urban Infra Structure Limited
- xviii. M/s Mytrah Energy (India) Private Limited
- xix. M/s Rudraksh Energy Limited
- xx. M/s Azure Power India Private Limited
- xxi. M/s Tata Power Company Limited



- xxii. M/s Federation of Indian Chambers of Commerce and Industry
- xxiii. M/s Chhattisgarh State Power Distribution Co. Ltd.
- xxiv. M/s Wind Independent Power Producers Association
- xxv. M/s Welspun Energy Limited
- xxvi. M/s Association of Power Producers
- xxvii. M/s Acme Solar Energy Private Limited

7. Subsequently, a public hearing was held on 11th March, 2014 and following stakeholders expressed their views/suggestions/comments in person:

- i. M/s Association of Power Producers
- ii. M/s Moser Baer Engineering and Construction Limited

8. The commission has analysed the views/comments/suggestions of the stakeholders and the Commission's decisions are as below:

A. Tax Rate:

Comments received

It is requested to determine Discount Factor considering effective tax rate which is increased from 32.45% to 33.99% due to increase in surcharge from 5 to 10% in Union Budget 2013. **(A2Z Maintenance & Engineering Services limited, Association of Power Producers, Federation of Indian Chambers of Commerce and Industry, Acme Solar Energy Private Limited, Welspun Energy Limited)**

Analysis and Decision

Comments have been noted and the effective tax rate of 33.99% is considered for determination of Discount Factor.



B. Capital Cost indexation mechanism

Comments received

Revised WPI numbers available of Electrical Machinery index need to be captured.
(Mytrah Energy (India) Private Limited, Association of Power Producers)

Analysis and Decision

Comments have been noted and latest data available on monthly wholesale price Index for Electrical Machinery and Steel from the site of Office of Economic Adviser are considered for capital cost indexation for various renewable energy technologies.

C. Determination of Biomass Tariff as per the norms revised under First Amendment of RE Tariff Regulations

Comments Received

Biomass Tariff may be released on the amended norms based on the consultation process carried out by the Commission on the draft Notification dated 6th December, 2013 instead of old assumption. The comments submitted on such notification for various norms should be considered for determination of generic tariff for biomass power projects. **(Rajasthan Biomass Power Developers Association, Malwa Power Private Limited, Punjab Biomass Power Limited, IL&FS Energy Development Company Limited, Bermaco Energy Limited, Indian Biomass Power Association, Viaton Energy Pvt. Ltd., Green Planet Energy Private Limited, DEE Piping Systems, Shalivahana Green Energy Limited)**

Analysis and Decision

Comments have been noted and the tariff for biomass based power projects based on Rankine Cycle are determined considering amended norms as per the RE Tariff (First Amendment) Regulations, 2014.



D. Following comments/suggestions received from stakeholders on normative parameters specified in the RE Tariff Regulations, 2012 are not the subject matter of present regulatory process which has been initiated for determination of generic tariff for FY 2014-15.

Interest on Loan:

It is requested that the Commission should consider revised Base Rate of SBI at 10% p.a. effective from 7.11 .2013 for determination on interest on loan in line with the CERC RE Tariff Regulation 2012. **(A2Z Maintenance & Engineering Services limited)**

Interest Rate should be considered at 13.5% based on the prevailing interest rates of Indian banks and financial institutions. **(Azure Power)**

Interest on Working Capital:

It is requested that the Commission should consider revised Base Rate of SBI at 10% p.a. effective from 7.11 .2013 for determination on interest on working Capital in line with the CERC RE Tariff Regulation 2012. **(A2Z Maintenance & Engineering Services limited)**

E. SMALL HYDRO PROJECTS (SHP)

Discount Factor

It should be calculated on the basis of actual interest rate i.e. in the range of 13.5-14%.

Capital Cost

Based on the Capital cost of projects which are under execution, it should be revised at Rs. 12 Crore/MW for projects upto 5 MW and Rs. 11 Crore/MW for projects between 5 to 25 MW.

Return on Equity

Considering higher gestation period and risk associated in execution of small hydro projects, pre-tax ROE should be 28% p.a. for first 10 years and 34% p.a. from 11th year onwards.

Interest on Loan

Financial Institutions (FIs) and Banks such as IREDA, REC, PFC etc are providing long term loan in the range of 13.5%-14%p.a. Therefore norm should be SBI Base Rate plus 375 basis points or such rate as has been notified by REC/PFC from time to time.

Interest on working Capital

It is suggested that the norm should be fixed at SBI Base Rate plus 425 basis points or 14.25% p.a.

O&M Expenses

Norm should be specified at Rs. 45 Lakhs /MW for projects up to 5 MW and Rs. 40 Lakhs/MW for projects from 5 to 25 MW.

(Himshakti Private Limited, Association of Power Producers)

Plant Load Factor (PLF)

Existing norm needs to be reviewed as actual PLF for many SHPs in Himachal Pradesh is in the range of 30-35%.

Capital Cost

Existing norm in the Regulations needs to be reviewed as actual costs of Small Hydro Projects are in the range of Rs. 10-11 Crore/MW in the State of Himachal Pradesh..

Project Specific Tariff

The Commission may consider to allow project specific tariff for those developers who are aggrieved of the norms proposed in the generic tariff order for FY 2014-15.

(NSL Renewable Power Private Limited)

Capital Cost

Most of the Small Hydro projects in India have been implemented under Memorandum of Understanding (MoU) routes in various States like Uttarakhand,



Himachal, Arunachal and elsewhere. In various States, different fees and charges and taxes etc. are not waived off/subsidized for small hydro and they have to be borne high fees and charges levied by State Agencies usually in Uttarakhand and Himachal. For example, there are a few hard costs such as in Himachal Pradesh:

- 1.5% of Project Cost for Local Area Development Fund
- 0.1% of Project cost for Environmental Monitoring Plan
- 2.5% of the Project cost for Catchment Area Treatment Plan + applicable service tax.
- 12% free energy to State Govt. for first 12 years, 18% from 13-18 years and 33% for the balance period. 1% additional free energy over and above the aforesaid rates is levied under Central Government Hydro Policy, 2008
- 1% of the Project Cost is levied as Labour Cess
- Entry Tax, VAT items are also additionally levied on the plant and machinery
- 12.36% Service Tax
- Forest Fees and charges in the form of NPV, Compensatory afforestation and Reclamation plan etc. which forms around 0.5% of the Project cost. Additionally, transmission line costs up to inter-connection points also need environmental cost to be borne by the developer in case the ROW is a forest area
- Other charges levied by various agencies such as PCB, Fisheries, Irrigation etc.
- There is also increase in costs of transportation of materials from downhill to uphill
- The actual CAPEX of SHP's comes to around Rs.12 Crore/MW

These aforesaid fees have to be borne by SHP Developers irrespective of the size of the Project. In view of this, it is requested to allow the fees, charges and project and these statutory expenses as a pass through in the CAPEX for small hydro.

(Kanchanjanga Power Company Private Limited)

Rebate in Tariff

For SHP projects in Himachal and Uttarakhand the State DISCOMS charge a rebate of 2% for prompt payment. It is requested to do away with the rebate on the tariff



paid by DISCOMS or factor the same in determination of tariff as it does bring down the net realization and hence affects the viability of the projects.(**Kanchanjanga Power Company Private Limited**)

F. WIND ENERGY PROJECTS

Capital cost

Capital cost for wind projects for FY 2013-14 should be revised to Rs. 7.25 Crore/MW. (**Association of Power Producers**)

Cost of scheduling and forecasting for wind energy

The Tariff Order does not capture the cost of enforcement of scheduling and forecasting for wind energy. Any decision on the Renewable Regulatory Fund (RRF) will have negative impact on ROE of wind energy generators. This must be considered in exercise of determination of generic levellised Tariff for wind energy.

(**Sterling Agro Industries Limited, IWPA**)

Capital Cost

Capital Cost should be considered at Rs. 6 crore/MW in view of the higher hub height, high land cost, land development charges and long transmission lines and ROW issues involved in implementing the projects.

Interest on Loan and Working Capital

It is requested to fix Interest on Loan and Working Capital at 15% as most of the projects are being financed by banks at rates ranging from 14-16%.

O&M Expenses

The O&M expenses are progressively increasing year on year. It needs to be fixed annually. The prevailing O&M expenses are around Rs. 11 Lakhs per MW. In addition VAT and Service Tax are also applicable. Total expenses are around Rs. 13 Lakh/MW. In addition, Insurance cost should also be considered at 1% of project cost for the first five years.

Capacity Utilisation factor (CUF)

Good quality sites have all been exhausted and only sites with relatively low wind potential are available. Therefore, CUF of such projects should be assumed at 19% and Wind Zone 4 & 5 should be removed.

CDM Benefits

Provision related to Sharing of CDM revenue should be withdrawn and generators should be allowed to retain entire CDM benefits. **(Indian Wind Power Association)**

Capital Cost

It is suggested that normative Capital Cost should be revised to Rs.7.25 crores per MW due to following reasons:-

- a) Capital cost has increased significantly in last few years due to steep increase in material equipment, transportation and land costs.
- b) Power evacuation is being done at EHV level which is generally 15 to 40 kms away from EHV Grid so the capital cost is impacted significantly.
- c) Majority of windy sites in the States offering good wind potential have already been exhausted. In order to harness newer wind sites offering lower WPD, larger wind turbines or Class III/S wind turbines are being installed. Due to larger rotor diameter and taller hub heights, the cost of transportation, installation charges etc. have been increased.

Normative O&M Cost

It is suggested that the O&M cost should be considered at Rs.14 (14.5) lakhs per MW. Annual escalation rate should be reflective of actual price due to higher WPI and increased manpower cost.

Capacity Utilization Factor

Wind Power density measurement at 80 meter height is very difficult. Very few masts are put up by C-WET or other agency. CERC should change the Wind Power Density measurement at 50 meter hub height for determining CUF.



Applicability of Tariff for Wind Energy Projects

The tariff determined through this Order should be made applicable for wind projects getting commissioned in the year 2013-14. If the PPA is signed during the current year, the tariff determined for FY 2013-14 should be applicable for next year as well.

Adoption of Wind Zones Concept by SERCs

CERC may try to make consensus among all SERCs to adopt wind zone based tariffs and Capex for the respective States. This will bring the uniformity and will help to lead the investment in wind energy. **(Welspun Energy Limited, Association of Power Producers)**

Capital Cost and O & M Cost norms

Capital Cost and O & M Cost norms need to be increased due to mandatory scheduling requirement and associated commercial mechanism, rupee devaluation, increased in land cost and additional cost required for compliance of recently notified CEA technical Regulation to control harmonics, DC current filter, active and reactive power supply during low voltage. It is suggested that proposed Capital Cost and O&M cost should be raised to atleast Rs. 655 Lakhs/MW and Rs. 10.50 Lakhs/MW respectively. **(Indian Wind Turbine Manufacturers Association)**

Wind Zone Criteria

Wind zoning should be based on 50 meter hub-height.

Capital Cost

Over all project cost needs to be increased by Rs. 50 Lakhs/MW due to cost / time overruns, rupee devaluation, mandatory scheduling.

O&M Expenses

It is to be increased by Rs. 2.23 lakhs/MW.

Evacuation cost

There is a significant increase in the evacuation cost, which needs to be considered in the Capital cost of the project. **(NSL Renewable Power Private Limited)**

Capacity Utilization Factor for wind

It is to be highlighted here (also corroborated by discussion with C-WET) that in order to arrive at wind density at any particular hub height, the height of the wind mast should be at least of 2/3rd of that hub height. Accordingly, to calculate the wind density to 80m, the height of the wind mast should be at least 53.3m. On contrary, the height of most of the wind masts put up by C-WET is in the range of 20-30 meters. Only very recently C-WET has started putting up wind masts on experimental basis with height of 50m. Besides, even the wind masts set by the private developers in recent months have the height of not more than 50m.

Wind mast of 50m height is marginally inadequate to calculate the wind density at 80m hub height. This has led to situation where in the wind density/zoning certification has become extremely unmanageable. This, in turn, is rendering the entire philosophy of wind zoning based on wind density at 80m hub height meaningless. It is requested to allow wind zoning based on wind density at 50m hub height till the time adequate numbers of masts with height more than 55m are set up and wind data from such masts for a minimum period of 2 years is available.

Commission is requested to come out with a robust methodology for zone certification which could form basis for zone wise tariff in all states.

Cost of forecasting & scheduling

For a typical 50 MW wind farm, forecasting and scheduling costs being incurred are as under:

Activity	Cost (tentative)
Cost of Forecasting Service Provider	Rs 50,000 /MW/year X 50 MW = Rs 25 Lakh /year
Cost of Coordinating Agency for scheduling	Rs 1,25,000 /MW/year X 50 MW = Rs 62.5 Lakh / year
Manpower Cost	Rs 8 Lakh/person X 3 persons = Rs 24 Lakh
Annual recurring cost	Rs 111.5 Lakhs / year i.e. Rs 2.23 Lakh/MW/year
Infrastructure Cost	Rs 20Lakh(SCADA) + Rs 15Lakh(Add. ABT meter)=Rs 35 Lakh
One time Cost	Rs 35 Lakhs

Forecasting and scheduling activities have led to increase in capital cost by Rs 35 Lakh/MW and increase in O&M cost by Rs 2.23 Lakh/MW. It is requested to allow such additional capital cost and O&M expenses.

Capital cost for wind

Capital cost has increased significantly due to steep increase in material (i.e. cost of copper, steel and cement), equipment, transportation and land costs. It is requested to consider following factors that are additionally responsible for increased capital cost for wind projects.

Evacuation system

Wind farms are located 20-30 km away from EHV grid and thus it leads to significant increase in power evacuation costs.

Increased transportation cost

Majority of 'good' sites with high wind density are already exhausted. Newer wind sites having lower WPD requires larger size WTGs and equipment are required to be transported to a much distant location which led to significant increase in transportation costs.

Wind farm control system

Wind farms require central monitor stations (SCADA based CMS) to control wind turbines through fiber optic network.

Impact of land prices & ROW

Cost of private land has shot up significantly in last couple of years. Besides, local people demand increased compensation for land and ROW.

Currency depreciation

Many components of WTG are imported and the weakening of Rupee in last one year has significantly impacted the turbine prices, leading to significant increase in cost of imported components and thus the capital cost.

(Wind Independent Power Producers Association)



Deemed generation benefit

Deemed generation benefit should be given to Wind projects in case distribution licensee ask wind energy generators to backing down. SERCs should strictly implement wind zone based separate tariff as followed by the Commission. **(Tata Power Company Limited)**

Moratorium period

One year period should be considered for term loan for determination of tariff.

Interest on Loan

It is suggested to consider prevailing Base Rate for determination Interest on term loan. Norm should be SBI Base Rate plus 350 basis points or such rate as has been notified by REC/PFC from time to time.

Interest on working Capital

Norm should be SBI Base Rate plus 400 basis points or 14.25% p.a.

Evacuation cost

It is suggested to consider appropriate evacuation infrastructure cost on per MW basis so as it can act as guiding factor for other SERCs in determination of wind energy tariff for their respective States.

Sharing of CDM benefit

Sharing of CDM revenue for projects under preferential Tariff PPA and also under Average Power Purchase Cost (APPC) PPA and made effective from prospective date of CERC RE Tariff Regulations, 2009. OR if CERC finds it is justifiable to impose CDM sharing the percentage of sharing shall be linked with the EURO price and to be shared when CERs trading value at spot market is over and above 8 Euros.

(Mytrah Energy (India) Limited)

Operation & Maintenance Expenses

It is suggested that the Commission may include insurance charges at 3%of capital cost. **(Rudraksh Energy)**

Biomass Fuel cost for Rajasthan State

Biomass fuel from Rajasthan State exported to adjoining States like Punjab and Haryana; therefore biomass cost should be kept in the same range in the adjoining States.

(Rudraksh Energy)

Lack of adoption of CERC Tariff Order by SERCs

It is requested that the Commission should act upon enforcing the principles and methodologies of its Regulations on SERCs to prevent grave injustice being done to wind industry by lack of viable tariffs for wind industry prevalent across the nation.

(Sterling Agro Industries Limited, IWPA)

Payment Security Mechanism

Distribution licensees in major States like Rajasthan, Madhya Pradesh and Tamil Nadu and others are making delayed payment from 100 to 200 days to renewable energy generators. Renewable energy generators are unable to serve their debt leading to financial stress and closure of units. CERC should address this issue in this Tariff Order. **(Sterling Agro Industries Limited, IWPA)**

G. MUNICIPAL SOLID WASTE PROJECTS

Feed-in-Tariff for Municipal Solid Waste to energy projects

Commission should consider Municipal Solid Waste projects with Refused Derived Fuel (RDF) and norms and parameters applicable for biomass projects should be applicable to such projects. **(JITF Urban Infra Structure Limited)**

Separate Feed-in-Tariff should be determined for Municipal Solid Waste to energy projects. **(Tata Power Company Limited)**

Scheduling requirement for Municipal Solid Waste Projects

Due to varying characteristics of fuel resulting into variation in power generation from Municipal Solid Waste projects, the Commission should allow 30% variation from schedule under deviation settlement mechanism for such projects. **(JITF Urban**

Infra Structure Limited)

Subsidy given to Municipal Solid Waste Projects

Subsidies given by Ministry for promotion of RDF based projects should not be considered for determination of Tariff. **(JITF Urban Infra Structure Limited)**

H. BIOMASS POWER PROJECTS

State of Chhattisgarh considered in “other States”

The State of Chhattisgarh has been considered in “other States”. Unfortunately, the State Commission has incorporated the CERC norms for determination of tariff for biomass. Generators are making undue advantage out of these inflated norms as compared to actually available price of Rice Husk. In fact the prevailing price of biomass fuel in the State of Chhattisgarh is varying from Rs. 1400 to Rs. 1500 per tonne. The Commission should consider Chhattisgarh as an independent State and not to cover under “Other States”. **(Chhattisgarh State Power Distribution Co. Ltd.)**

Separate norms for small biomass power plants

There is an urgent need to encourage small biomass based distributed generation assets with size less than 5MW using direct combustion and gasification technology. Capital cost for such projects may be considered at Rs. 750-800 Lakhs/MW and Operation & Maintenance norm may be considered at Rs. 65-75 lakhs/MW. For such projects, fuel adjustment and truing up should be carried out on half yearly basis. For biomass projects, the Commission may suitably revise annual O&M costs upward in line with empirical data and market trend. The Plant Load Factor norm should be fixed at 60% in first year and 70% in 2nd year onward. The Auxiliary consumption norm may be further relaxed to 12.5%. The Debt:Equity ratio norm may be further relaxed for biomass power projects (Rankine cycle and Gasifier based). **(Tata Power Company Limited)**

I. SOLAR PV PROJECTS

Capital Cost

The Commission may consider revised Capital cost for solar PV as suggested in our comments given in the Petition No. 353/MP/2013.

Debt-Equity ratio

It is recommended that the Debt-Equity ratio should be changed to 75:25 or even 80:20. This will relax tariff further with the reduction in equity component.

Interest on loan

Major public sector bank consider renewable energy project more risky as compared to infrastructure projects. Hence RE projects rely on foreign lenders which invite lending rate plus hedging risks. It is recommended to consider higher interest rate for determination of tariff.

Capacity Utilisation Factor (CUF)

CUF of 23% specified for solar thermal projects require larger solar field, additional land and higher capital cost. Annual plant performance degradation of some 0.5% per year up to a maximum of at least 6% over 25 years due to turbine degradation, heat exchanger fouling must be taken into account. Commission notify varying solar irradiation across the different State varying from 15%,16%, 17% , 18%, 19% and 20%.

Consumption

For solar thermal projects, start-up power must be part of the auxiliary consumption. In India developers have recorded auxiliary consumption in the range of 12-5% depending upon the time of the year. For solar PV projects, 1% auxiliary consumption should be considered.

Module degradation loss and grid unavailability loss

Module degradation loss and grid unavailability loss need to be considered.
(Federation of Indian Chambers of Commerce and Industry, Acme Solar Energy Private Limited)



Debt Equity Ratio

It is suggested that the ratio be changed to 75:25. This will reduce the tariff with reduction in equity component.

Interest on Loan

It is suggested that the loan tenure of 14 years may be considered in view of prevailing tight liquidity conditions and impact on cash flows.

Interest on Loan

It is suggested that the rates may be aligned to the lending rates of PFC, REC which are currently as high as 13.5%.

Capacity Utilization Factor

It is suggested that six varying zone-wise CUF levels be notified across India as 15%, 16%, 17%, 18%, 19% and 20%. This will mean six different FITs for this job.

Auxiliary Consumption:

Auxiliary power is required for air conditioning in inverter room & control room and lighting in night. It is suggested that the auxiliary consumption be accounted at 2%.

(Association of Power Producers, Welspun Energy Limited)

Subsidy or Incentive by the Central and State Government

It is perhaps time to decide whether AD should continue to be given to attract investors into the sector considering the fact that the sector is already around four years old. AD benefit in Solar sector is creating distortion and disparities between IPPs and big corporate houses and disturbing the equilibrium against IPPs particularly when the selection of solar project developer is through competitive bidding. **(Welspun Energy Limited)**

J. SOLAR THERMAL PROJECT

Transmission Charges and losses on STU and CTU network

The transmission Charges and losses may be waived off or reimburses by the procurer at actual.

Return on Equity

ROE suitably increased for Solar Thermal projects in order to neutralize the unforeseen incremental risk element and challenges.

O&M expenses

O&M expenses should be increased to Rs. 20 Lakhs/MW. **(Association of Power Producers)**

Solar thermal with Storage

Solar Thermal technology with storage facility needs to be incentivised. **(Federation of Indian Chambers of Commerce and Industry)**

THE GENERIC LEVELLISED GENERATION TARIFF FOR VARIOUS RENEWABLE ENERGY TECHNOLOGIES, FOR FY 2014-15

9. The generic levellised generation tariffs for various renewable energy technologies, for FY 2014-15 are discussed below:

USEFUL LIFE

10. Clause (aa) of sub-Regulation (1) of Regulation 2 of the RE Tariff Regulations defines 'useful life' in relation to a unit of a generating station (including evacuation system) to mean the following duration from the date of commercial operation (COD) of such generation facility:

Renewable Energy Projects	Years
Wind energy	25
Small Hydro	35
Biomass power project with Rankine Cycle technology	20
Non-fossil fuel based co-generation	20
Solar PV	25
Solar Thermal	25
Biomass Gasifier	20
Biogas	20



CONTROL PERIOD

11. Regulation 5 of the RE Tariff Regulations provides that the control period for determination of tariff for renewable energy projects (RE projects) shall be of five years. The first year of the control period was from FY 2012-13. The Provision to the said regulation stipulates that the tariff determined for the RE projects commissioned during the control period shall continue to be applicable for the entire duration of the tariff period as specified in Regulation 6 of the RE Tariff Regulations.

TARIFF PERIOD

12. In terms of Regulation 6 of the RE Tariff Regulations, the tariff period in respect of the RE projects is as under:

Renewable Energy Projects	Years
Wind energy	13 *
Small Hydro below 5 MW	35
Small Hydro (5 MW -25 MW)	13*
Biomass	13*
Non-fossil fuel co-generation	13*
Solar PV and Solar Thermal	25
Biomass Gasifier and Biogas	20

* The RE Tariff Regulations provides for a minimum period of thirteen (13) years.

In terms of clauses (e) and (f) of the said regulation, the tariff period specified above shall be reckoned from the date of commercial operation of the RE projects and the tariff determined under the regulations shall be applicable for the duration of the tariff period.

TARIFF STRUCTURE

13. Clause (1) of Regulation 9 of the RE Regulations 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, single part tariff with two components, fixed cost component and fuel cost component, is to be determined.

TARIFF DESIGN

14. In terms of Regulation 10 of the RE Tariff Regulations, the tariff design for renewable energy generating stations is as under:

"(1) The generic tariff shall be determined on levellised basis for the Tariff Period.

Provided that for renewable energy technologies having single part tariff with two components, tariff shall be determined on levellised basis considering the year of commissioning of the project for fixed cost component while the fuel cost component shall be specified on year of operation basis.

(2) For the purpose of levellised tariff computation, the discount factor equivalent to Post Tax weighted average cost of capital shall be considered.

(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.'



LEVELLISED TARIFF

15. Levellised Tariff is calculated by carrying out levellisation for 'useful life' of each technology considering the discount factor for time value of money.

DISCOUNT FACTOR

16. The discount factor considered for this purpose is equal to the Post Tax weighted average cost of the capital on the basis of normative debt: equity ratio (70:30) specified in the Regulations. Considering the normative debt equity ratio and weighted average of the post tax rates for interest and equity component, the discount factor is calculated. Interest Rate considered for the loan component (i.e.70%) of Capital Cost is 12.70% (as explained later). For equity component (i.e. 30%) rate of Return on Equity (ROE) considered at Post Tax ROE of 16% considered. The discount factor derived by this method for all technology is 10.67% $((12.70\% \times 0.70 \times (1 - 33.99\%)) + (16.0\% \times 0.30))$.

CAPITAL COST

17. Regulation 12 of the RE Tariff Regulations stipulates that the norms for the capital cost as specified in the technology specific chapter shall be inclusive of all capital works like plant and machinery, civil works, erection and commissioning, financing and interest during construction, and evacuation infrastructure up to inter-connection point. The Commission has specified the normative capital cost, applicable for the first year of control period i.e. FY 2012-13, for various RE technologies viz. Wind Energy, Small Hydro Power, Biomass Power, Non-Fossil Fuel based Cogeneration, Solar PV, Solar Thermal, Biomass Gasifier and Biogas based power projects.

18. In order to determine the normative capital cost for the remaining years of the control period, the regulations stipulate the indexation mechanism, Wind Energy, Small Hydro Power, Biomass Power, Non-Fossil Fuel based Cogeneration, Biomass Gasifier and Biogas based power projects. However, the Capital Cost norms for Solar PV and Solar Thermal Power Projects shall be reviewed on annual basis. The indexation mechanism



shall take into account adjustments in capital cost with the changes in Wholesale Price Index of Steel and Wholesale Price Index of Electrical Machinery as per formulation stipulated under the RE Tariff Regulations, which is reproduced below.

$$CC_{(n)} = P\&M_{(n)} * (1+F_1+F_2+F_3)$$

$$P\&M_{(n)} = P\&M_{(0)} * (1+d_{(n)})$$

$$d_{(n)} = [a * \{(SI_{(n-1)}/SI_{(0)}) - 1\} + b * \{(EI_{(n-1)}/EI_{(0)}) - 1\}] / (a+b)$$

Where,

$CC_{(n)}$ = Capital Cost for n^{th} year

$P\&M_{(n)}$ = Plant and Machinery Cost for n^{th} year

$P\&M_{(0)}$ = Plant and Machinery Cost for the base year

Note: $P\&M_{(0)}$ is to be computed by dividing the base capital cost (for the first year of the control period) by $(1+F_1+F_2+F_3)$. Factors F_1, F_2, F_3 for each RE technology has been specified separately, as summarized in following table.

$d_{(n)}$ = Capital Cost escalation factor for year (n) of Control Period

$SI_{(n-1)}$ = Average WPI Steel Index prevalent for calendar year (n-1) of the Control Period

$SI_{(0)}$ = Average WPI Steel Index prevalent for calendar year (0) at the beginning of the Control Period

$EI_{(n-1)}$ = Average WPI Electrical Machinery Index prevalent for calendar year (n-1) of the Control Period

$EI_{(0)}$ = Average WPI Electrical Machinery Index prevalent for calendar year (0) at the beginning of the Control Period

a = Constant to be determined by Commission from time to time,
(for weightage to Steel Index)

b = Constant to be determined by Commission from time to time,
(for weightage to Electrical Machinery Index)

F_1 = Factor for Land and Civil Works

F_2 = Factor for Erection and Commissioning

F_3 = Factor for IDC and Financing Cost



The default values of the factors for various RE technologies as stipulated under the said RE Regulations, is summarized in the table below,

Parameters	Wind Energy	Small Hydro Projects	Biomass based Rankine cycle Power plant, Non-Fossil Fuel Based Cogeneration Biomass Gasifier and Biogas based projects
a	0.6	0.6	0.7
b	0.4	0.4	0.3
F1	0.08	0.16	0.10
F2	0.07	0.10	0.09
F3	0.10	0.14	0.14

The Commission has relied on the following sources for relevant information on various indices:

- Source for WPI (electrical & machinery and iron and steel), WPI (all commodities), WPI (Price of HSD): Office of Economic Advisor, Ministry of Commerce & Industry (www.eaindustry.nic.in)
- Source for IRC (Average Annual Inflation rate for indexed energy charge component in case of captive coal mine source): CERC (www.cercind.gov.in)

Technology specific capital cost of RE projects is discussed here in under:

Technology specific capital cost of RE projects is discussed herein under:

(A) Capital Cost of Wind Energy for FY 2014-15

19. Regulation 24 provides that the capital cost for wind energy 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 IDC.

20. The Commission under Regulation 24 (2) has specified the normative capital cost for wind energy projects as ₹ 575 Lakh/MW for FY 2012-13 which shall be linked to the indexation mechanism specified under Regulation 25 of the RE Tariff Regulations. In accordance with the above referred Regulation, the normative capital cost of the Wind

energy Projects shall be ₹ 603.929 Lakh/MW for FY 2014-15. The detailed computations of the indexation mechanism and determination of the capital cost for FY 2014-15 thereof, has been enclosed as **Appendix-1** of this Order.

(B) Capital cost of Small Hydro Projects for FY 2014-15

21. Small Hydro Projects for the purpose of the RE Tariff Regulations cover those projects which are located at the sites approved by the State Nodal Agencies/State Governments using new plant and machinery and with installed power plant capacity lower than or equal to 25 MW.

22. The Commission under Regulation 28 (1) has specified the normative capital cost for small hydro projects for FY 2012-13 as under:

Region	Project Size	Capital Cost (FY 2012-13) (₹ Lakh/ MW)
Himachal Pradesh, Uttarakhand and North Eastern States	Below 5 MW	770
	5 MW to 25 MW	700
Other States	Below 5 MW	600
	5 MW to 25 MW	550

23. In line with the indexation mechanism, specified in Regulation 29 of the RE Tariff Regulations, the normative capital cost for FY 2014-15 for Small Hydro Projects shall be as under,

Region	Project Size	Capital Cost (FY 2014-15) (₹ Lakh/ MW)
Himachal Pradesh, Uttarakhand and North Eastern States	Below 5 MW	808.739
	5 MW to 25 MW	735.217
Other States	Below 5 MW	630.186
	5 MW to 25 MW	577.671

The detailed computations of the indexation mechanism and the determination of the capital cost for FY 2014-15 thereof, has been enclosed as **Appendix-2** of this Order.

(C) Capital Cost of Biomass based Power Projects for FY 2014-15

24. The Commission under Regulation 34 of the RE Tariff (First Amendment) Regulations has specified the normative capital cost for the biomass power projects based on Rankine cycle technology application for FY 2013-14 as under:

- a. ₹ 540 lakh/MW for project [other than rice straw and juliflora (plantation) based project] with water cooled condenser;
- b. ₹ 580 lakh/MW for Project [other than rice straw and Juliflora (plantation) based project] with air cooled condenser;
- c. ₹ 590 lakh/MW for rice straw and juliflora (plantation) based project with water cooled condenser;
- d. ₹ 630 lakh/MW for rice straw and juliflora (plantation) based project with air cooled condenser.

25. In line with the indexation mechanism, specified in Regulation 35 of the RE Tariff Regulations, the normative capital cost for FY 2014-15 for Biomass Projects determined considering capital cost specified in the RE Tariff (First Amendment) Regulations for FY 2013-14 as base year capital cost. Average WPI Steel Index and average Electrical

Machinery Index prevalent for calendar year 2013 considered for $SI_{(n-1)}$ and $EI_{(n-1)}$ respectively. Average WPI Steel Index and average WPI Electrical Machinery Index prevalent for year 2012 for $SI_{(0)}$ and $EI_{(0)}$ respectively. Accordingly, the normative capital cost for FY 2014-15 for Biomass Projects shall be as under,

Biomass Rankine Cycle Projects	Capital Cost (FY 2014-15) (₹ Lakh/ MW)
Project [other than rice straw and juliflora (plantation) based project] with water cooled condenser	544.187
Project [other than rice straw and Juliflora(plantation) based project] with air cooled condenser	584.497
For rice straw and juliflora (plantation) based project with water cooled condenser	594.575
FOR rice straw and juliflora (plantation) based project with air cooled condenser	634.885

26. The detailed computations of the indexation mechanism and the determination of the capital cost for FY 2014-15 thereof, has been enclosed as **Appendix-3** of this Order.

(D) Capital Cost of Non-fossil fuel based Cogeneration Projects for FY 2014-15

27. Non-fossil based cogeneration has been defined as the process in which more than one form of energy is produced in a sequential manner by using biomass. As per Regulation 4(d) of the RE Tariff Regulations, a project to qualify as the non-fossil based cogeneration project must be using new plant and machinery with topping cycle mode of operation which uses the non-fossil fuel input for power generation and utilizes the thermal energy generated for useful heat applications in other industrial activities simultaneously, and where the sum of useful power output and half of useful thermal output is greater than 45% of the plant's energy consumption during the season.

28. The Commission under Regulation 47 has specified the normative capital cost for the Non-Fossil Fuel Based Cogeneration Projects as ₹ 420 Lakh/MW for FY 2012-13 which shall be linked to the indexation mechanism specified under Regulation 48 of the RE



Tariff Regulations. In accordance to the above referred Regulation, the normative capital cost of Non-Fossil Fuel based Cogeneration power projects shall be ₹ 440.708 Lakh/MW for FY 2014-15. The detailed computations of the indexation mechanism and determination of the capital cost for FY 2014-15 thereof, has been enclosed as **Appendix-4** of this Order.

(E) Capital Cost of Solar PV based Power Projects for FY 2014-15

29. Solar Photo Voltaic (PV) power projects which directly convert solar energy into electricity using the crystalline silicon or thin film technology or any other technology as approved by the Ministry of New and Renewable Energy and are connected to the grid, qualify for the purpose of tariff determination under the RE Tariff Regulations.
30. The Commission under Regulation 57 specified the normative capital cost for the Solar PV power projects as ₹ 1000 Lakh/MW for the FY 2012-13.
31. The Commission vides its *suo-motu* Order (Petition No. 242/SM/2012) dated 28th February, 2013, determined the normative capital cost for the Solar PV power projects as ₹ 800.00 Lakh/MW for the FY 2013-14.
32. The Commission vides its *suo-motu* Order (Petition No. SM/353/2014) dated 15/5/2014 determined the normative capital cost for the Solar PV power projects as ₹ 691 Lakh/MW for the FY 2014-15.

(F) Capital Cost of Solar Thermal based Power Projects for FY 2014-15

33. In order to qualify for tariff determination under the RE Tariff Regulations, Solar Thermal Power Project shall be based on concentrated solar power technologies with line focusing or point focusing as may be approved by the Ministry of New and Renewable



Energy and which uses direct sunlight to generate sufficient heat to operate a conventional power cycle to generate electricity.

34. The Commission under Regulation 61 has specified the normative capital cost for the Solar Thermal power projects as ₹ 1300 Lakh/MW for the FY 2012-13.
35. The Commission vides its *suo-motu* Order (Petition No. 242/SM/2012) dated 28th February, 2013, determined the normative capital cost for the Solar Thermal power projects as ₹ 1200.00 Lakh/MW for the FY 2013-14.
36. The Commission vides its *suo-motu* Order (Petition No. SM/353/2014) dated 15/5/2014 determined the normative capital cost for the Solar Thermal power projects as ₹ 1200 Lakh/MW for the FY 2014-15.

(G) Capital Cost of Biomass Gasifier Power Projects for FY 2014-15

37. The Commission under Regulation 66 has specified the normative capital cost for the Biomass Gasifier power projects based on Rankine cycle shall be ₹ 550.00 Lakh/MW for the FY 2012-13 and after taking into account of capital subsidy of ₹ 150.00 Lakh/MW, net project cost shall be ₹ 400.00 Lakh/MW for the FY 2012-13 which shall be linked to the indexation mechanism specified under Regulation 67 of the RE Tariff Regulations. In accordance to the above referred Regulation, the normative capital cost of Biomass gasifier power projects shall be ₹ 577.118 Lakh/MW for FY 2014-15. After taking into account of capital subsidy of ₹ 150.00 Lakh/MW, net project cost shall be ₹ 427.118 Lakh/MW for the FY 2014-15. The detailed computations of the indexation mechanism and determination of the capital cost for FY 2014-15 thereof, has been enclosed as **Appendix-5** of this Order.



(H) Capital Cost of Biogas based Power Projects for FY 2014-15

38. In order to qualify for tariff determination under the RE Tariff Regulations, grid connected biogas based power projects that uses 100% Biogas fired engine, coupled with Biogas technology for co-digesting agriculture residues, manure and other bio waste as may be approved by the Ministry of New and Renewable Energy.
39. The Commission under Regulation 76 has specified the normative capital cost for the Biogas based power projects shall be ₹ 1100.00 Lakh/MW for the FY 2012-13 and after taking into account of capital subsidy of ₹ 300.00 Lakh/MW, net project cost shall be ₹ 800.00Lakh/MW for the FY 2012-13 which shall be linked to the indexation mechanism specified under Regulation 77 of the RE Tariff Regulations. In accordance to the above referred Regulation, the normative capital cost of Biogas based power projects shall be ₹1154.236 Lakh/MW for FY 2014-15. After taking into account of capital subsidy of ₹ 300.00 Lakh/MW, net project cost shall be ₹ 854.236 Lakh/MW for the FY 2014-15. The detailed computations of the indexation mechanism and determination of the capital cost for FY 2014-15 thereof, has been enclosed as **Appendix-6** of this Order.
40. The capital cost for the second year (i.e. FY 2014-15) of the control period in respect of the renewable energy power generating stations is summarized as under:

Renewable Energy Projects	Capital Cost Norm for FY 2014-15 (₹ Lakh/MW)
(1) Wind Energy Projects	603.929
(2) Small Hydro Projects	
(a) Himachal Pradesh, Uttarakhand and North Eastern States (less than 5 MW)	808.739
(b) Himachal Pradesh, Uttarakhand and North Eastern States (5MW to 25 MW)	735.217
(c) Other States (below 5 MW)	630.186
(d) Other States (5MW to 25 MW)	577.671
(3) Biomass Power Projects	
(a) project [other than rice straw and juliflora (plantation) based project] with water cooled condenser	544.187
(b) Project [other than rice straw and Juliflora (plantation) based project] with air cooled condenser	584.497
(c) Rice straw and juliflora (plantation) based project with water cooled condenser	594.575
(d) Rice straw and juliflora (plantation) based project with air cooled condenser	634.885
(4) Non-fossil fuel based co-generation Power Projects	440.708
(5) Solar PV Power Projects	691.000
(6) Solar Thermal Power Projects	1200.00
(7) Biomass Gasifier Power Projects	427.118
(8) Biogas Power Projects	854.236

DEBT-EQUITY RATIO

41. Sub-Regulation (1) of Regulation 13 of the RE Tariff Regulations provides that the debt-equity ratio of 70:30 is to be considered for determination of generic tariff based on *suo-motu* petition.



42. Based on the debt equity ratio of 70:30, the debt and equity components of the normative capital cost for determination of tariff for the RE projects have been worked out as under:

Renewable Energy Projects	Debt (₹ Lakh)	Equity (₹ Lakh)
(1) Wind Energy (for all zones)	422.750	181.179
(2) Small Hydro		
(a) Himachal Pradesh, Uttarakhand and North Eastern States (below 5 MW)	566.117	242.622
(b) Himachal Pradesh, Uttarakhand and North Eastern States (5 MW to 25 MW)	514.652	220.565
(c) Other States (below 5 MW)	441.130	189.056
(d) Other States (5MW to 25 MW)	404.370	173.301
(3) Biomass		
(a) project [other than rice straw and Juliflora (plantation) based project] with water cooled condenser	380.931	163.256
(b) Project [other than rice straw and Juliflora (plantation) based project] with air cooled condenser	409.148	175.349
(c) Rice straw and Juliflora (plantation) based project with water cooled condenser	416.202	178.372
(d) Rice straw and Juliflora (plantation) based project with air cooled condenser	444.419	190.465
(4) Non-fossil fuel co-generation	308.496	132.212
(5) Solar PV	483.70	207.30
(6) Solar Thermal	840.000	360.000
(7) Biomass Gasifier based Power Projects	298.983	128.135
(8) Biogas based Power Projects	597.965	256.271

RETURN ON EQUITY

43. Sub-Regulation (1) of Regulation 16 of the RE Tariff Regulations provides that the value base for the equity shall be 30% of the capital cost for generic tariff determination. Sub-



Regulation (2) of the said Regulation stipulates the normative return on equity (ROE) as under:

- (a) 20% per annum for the first 10 years, and
- (b) 24% per annum from the 11th year onwards.

INTEREST ON LOAN

44. Sub-Regulation (1) of Regulation 14 of the RE Regulations provides that the loan tenure of 12 years is to be considered for the purpose of determination of tariff for RE projects. Sub-Regulation (2) of the said Regulation provides for computation of the rate of interest on loan as under:

“(a) The loans arrived at in the manner indicated in the Regulation 13 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.

(b) For the purpose of computation of tariff, the normative interest rate shall be considered as average State Bank of India (SBI) Base rate prevalent during the first six months of the previous year plus 300 basis points.

(c) 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”.

45. The weighted average State Bank of India (SBI) Base rate prevalent during the first six months has been considered for the determination of tariff, as shown in the table below:

Period from	Period to	Base rate
1/4/2013	30/9/2013	09.70%
Average Base rate for first six months of FY 13-14		09.70%

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

46. In terms of the above, the computations of interest on loan carried out for determination of tariff in respect of the RE projects treating the value base of loan as



70% of the capital cost and the weighted average of Base rate prevalent during the first six months of the (i.e. 9.70%) plus 300 basis points (equivalent to interest rate of 12.70%).

DEPRECIATION

47. Regulation 15 of the RE Tariff Regulations provides for computation of depreciation in the following manner:

"(1) The value base for the purpose of depreciation shall be the Capital Cost of the asset admitted by the Commission. The Salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the Capital Cost of the asset.

(2) Depreciation per annum shall be based on 'Differential Depreciation Approach' over loan period beyond loan tenure over useful life computed on 'Straight Line Method'. The depreciation rate for the first 12 years of the Tariff Period shall be 5.83% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 13th year onwards.

(3) Depreciation shall be chargeable from the first year of commercial operation. Provided that in case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis".

48. In accordance with the above, the rate of depreciation for the first 12 years has been considered as 5.83% and the rate of depreciation from the 13th year onwards has been spread over the balance useful life of the RE project as under:



Details	Wind Energy	Small Hydro	Biomass	Non-fossil fuel co-generation	Solar PV	Solar Thermal	Biomass Gasifier	Biogas
Useful Life (in years)	25	35	20	20	25	25	20	20
Rate of depreciation for 12 years (%)	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83
Rate of depreciation after first 12 years (%)	1.54	0.87	2.51	2.51	1.54	1.54	2.51	2.51

INTEREST ON WORKING CAPITAL

49. Regulation 17 of the RE Tariff Regulations provides for the working capital requirements of the RE projects as under:

“(1) The Working Capital requirement in respect of wind energy projects, Small Hydro Power, Solar PV and Solar thermal power projects shall be computed in accordance with the following:

Wind Energy / Small Hydro Power /Solar PV / Solar thermal

- 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 spare @ 15% of operation and maintenance expenses*

(2) The Working Capital requirement in respect of biomass power projects and non-fossil fuel based co-generation projects shall be computed in accordance with the following clause:

Biomass(Rankine Cycle Technology), Biomass Gasifier, Biogas Power and Non-fossil fuel Co-generation

- a) Fuel costs for four months equivalent to normative PLF;*
- b) Operation & Maintenance expense for one month;*
- c) Receivables equivalent to 2 (Two) months of fixed and variable charges for sale of electricity calculated on the target PLF;*



d) Maintenance spare @ 15% of operation and maintenance expenses

(3) Interest on Working Capital shall be at interest rate equivalent to the average State Bank of India Base Rate prevalent during the first six months of the previous year plus 350 basis points”.

50. Receivables equivalent to two months of actual fixed cost and variable cost, (as applicable for biomass power and non-fossil fuel based co-generation) have been considered. As mentioned in the Para No. 46, interest rate considered as weighted average of State Bank of India Base Rate prevalent during the first six months of the previous year plus 350 basis points (equivalent to interest rate of 13.20%). The interest on working capital has been worked out as specified below for determination of tariff of the RE projects:

Details	Wind Energy	Small Hydro	Biomass, Biomass Gasifier and Biogas	Non-fossil fuel co-generation	Solar PV	Solar Thermal
(A) For Fixed charges						
(i) O&M expenses (month)	1	1	1	1	1	1
(ii) Maintenance spares (%) of O&M expenses	15	15	15	15	15	15
(iii) Receivables (months)	2	2	2	2	2	2
(B) For Variable Charges						
Biomass/Bagasse stock (months)	-	-	4	4	-	-
(C) Interest On Working Capital (%)	13.20%	13.20%	13.20%	13.20%	13.20%	13.20%

Source for SBI Base Rate: State Bank of India (www.statebankofindia.com)



OPERATION AND MAINTENANCE EXPENSES

51. Regulation 18 of the RE Tariff Regulations provides for Operation and Maintenance Expenses (O&M expenses) in respect of RE projects as under:

“Operation and Maintenance Expenses

(1) ‘Operation and Maintenance or O&M expenses’ shall comprise repair and maintenance (R&M), establishment including employee expenses and administrative & general expenses.

(2) Operation and maintenance expenses shall be determined for the Tariff Period based on normative O&M expenses specified by the Commission subsequently in these Regulations for the first Year of Control Period.

(3) Normative O&M expenses allowed during first year of the Control Period (i.e. FY 2012-13) under these Regulations shall be escalated at the rate of 5.72% per annum over the Tariff Period”.

52. The normative O&M expenses for various RE technologies specified under the relevant provisions of the RE Tariff Regulations are as under:

(a) Wind Energy: Regulation 27 of RE Tariff Regulations provides that the normative O&M expenses for the first year of the control period (i.e. 2012-13) as ₹ 9 lakh per MW and shall be escalated at the rate of 5.72% per annum over the tariff period for determination of the levellised tariff. Accordingly, the Commission has considered O&M cost norm for wind energy as ₹ 10.05 Lakh/MW for FY 2014-15.

(b) Small Hydro: Regulation 32 of RE Regulations provided for the normative O& M expenses for small hydro projects for the year 2012-13 which shall be escalated at the rate of 5.72% per annum over the tariff period for determination of the levellised tariff.



The table below presents the normative O&M Expenses considered by the Commission for small hydro power for FY 2012-13;

Region	Project Size	O&M expenses (₹ Lakh/MW)
Himachal Pradesh, Uttarakhand and North Eastern States	Below 5 MW	25
	5 MW to 25 MW	18
Other States	Below 5 MW	20
	5 MW to 25 MW	14

Accordingly, the table below presents the normative O&M Expenses considered by the Commission for small hydro power for FY 2014-15,

Region	Project Size	O&M expenses (₹ Lakh/MW)
Himachal Pradesh, Uttarakhand and North Eastern States	Below 5 MW	27.94
	5 MW to 25 MW	20.12
Other States	Below 5 MW	22.35
	5 MW to 25 MW	15.65

(c) Biomass: Regulation 39 of RE Tariff (First Amendment) Regulations provides that the normative O& M expenses for biomass based projects for the year 2013-14 shall be ₹ 40 Lakh per MW and which shall be escalated at the rate of 5.72% per annum over the tariff period for determination of the levellised tariff. Accordingly, the Commission has considered O&M cost norm for biomass power as ₹ 42.29Lakh/MW for FY 2014-15.

(d) Non-fossil fuel co-generation: As per Regulation 55 of RE Tariff Regulations, the normative O&M Expenses for non-fossil fuel co-generation projects for the year 2012-13 has been specified as ₹ 16 Lakh per MW which shall be escalated at the rate of 5.72%

per annum over the tariff period for determination of the levellised tariff. Accordingly, the Commission has considered O&M cost norm for non-fossil fuel based co-generation as ₹ 17.89 Lakh/MW for FY 2014-15.

(e) Solar PV: Regulation 59 of RE Tariff Regulations provides that the normative O&M expenses for solar PV projects for the year 2012-13 shall be ₹ 11 Lakh per MW which shall be escalated at the rate of 5.72% per annum over the tariff period for determination of the levellised tariff. Accordingly, O&M expense norm for solar PV power project as ₹ 12.30 Lakh/MW for FY 2014-15 has been considered.

(f) Solar Thermal: Regulation 63 of the RE Tariff Regulations specified the normative O&M expenses for solar thermal power projects shall be ₹ 15 Lakh/MW for the first year of operation, which shall be escalated at the rate of 5.72% per annum over the tariff period for determination of the levellised tariff. Accordingly, O&M expense norm for solar thermal power project as ₹ 16.77 Lakh/MW for FY 2014-15, has been considered.

(g) Biomass Gasifier: Regulation 71 of the RE Tariff Regulations specified the normative O&M expenses for solar thermal power projects shall be ₹ 40 Lakh/MW for the first year of operation, which shall be escalated at the rate of 5.72% per annum over the tariff period for determination of the levellised tariff. Accordingly, the Commission has considered O&M cost norm for biomass gasifier based power plant as ₹ 44.71 Lakh/MW for FY 2014-15.

(h) Biogas: Regulation 80 of the RE Tariff Regulations specified the normative O&M expenses for solar thermal power projects shall be ₹ 40 Lakh/MW for the first year of operation, which shall be escalated at the rate of 5.72% per annum over the tariff period for determination of the levellised tariff. Accordingly, the Commission has considered O&M cost norm for biogas based power plant as ₹ 44.71 Lakh/MW for FY 2014-15.

53. The normative O&M expenses have been worked out as specified above for determination of tariff for the renewable energy generating stations.

CAPACITY UTILISATION FACTOR

54. Regulations 26, 30, 58 and 62 of the RE Tariff Regulations specify the norms for Capacity Utilization Factor (CUF)/Plant Load Factor (PLF) in respect of the Wind Energy, Small Hydro, Solar PV and Solar Thermal based power generating stations as per the details given in the table below which has been considered for determination of tariff.

Renewable Energy Projects	CUF
(A) Wind Energy	
Annual Mean Wind Power Density (W/m ²)	
Wind zone - 1 (Upto 200)	20 %
Wind zone - 2 (201 - 250)	22 %
Wind zone - 3 (251 - 300)	25 %
Wind zone - 4 (301 - 400)	30 %
Wind zone - 5 (Above 400)	32 %
(B) Small Hydro	
(i) Himachal Pradesh, Uttarakhand and North Eastern States	45 %
(ii) Other States	30 %
(C) Solar PV	19 %
(D) Solar Thermal	23 %

PLANT LOAD FACTOR (PLF)

55. Regulations 36, 68 and 78 of the RE Tariff Regulations specify the plant load factor for Biomass, Biomass Gasifier and Biogas based renewable energy generating stations as given in the table below which has been considered for determination of fixed charges component of tariff.

Renewable Energy Projects	PLF
(A) Biomass	
(a) During stabilization (6 months)	60 %
(b) During remaining period of the first year (after stabilization)	70 %
(c) Second year onwards	80 %
(B) Biomass Gasifier	85 %
(C) Biogas	90 %

56. Regulation 49 of the RE Tariff Regulations stipulates the plant load factor for Non-fossil Fuel based Co-generation projects as under, computed on the basis of plant availability for number of operating days considering the operations during crushing season and off-season and load factor of 92%. The number of operating days for different States as specified in the Regulation 49(2) is as under:

States	Operating days	PLF
Uttar Pradesh and Andhra Pradesh	120 days (crushing)+ 60 days (off-season) = 180 days	45 %
Tamil Nadu and Maharashtra	180 days (crushing)+ 60 days (off-season) = 240 days	60 %
Other States	150 days (crushing) + 60 days (off-season) = 210 days	53 %

AUXILIARY POWER CONSUMPTION

57. Regulations 31, 37, 50, 64, 69 and 79 of the RE Tariff Regulations as amended from time to time, stipulate the auxiliary power consumption factor as under which has been considered for determination of tariff of the RE projects :

Renewable Energy Projects	Auxiliary Consumption Factor
Small Hydro	1 %
Biomass	
a) the project using water cooled condenser	i. During first year of operation: 11%; ii. From 2 nd year onwards: 10%.
b) project using air cooled condenser	i. During first year of operation: 13%; ii. From 2 nd year onwards: 12%.
Non-fossil fuel co-generation	8.5 %
Solar Thermal	10 %
Biomass Gasifier	10 %
Biogas	12 %

STATION HEAT RATE

58. The Station Heat Rates (SHR) specified under Regulations 38 and 51 of the RE Tariff Regulations as amended from time to time for biomass and non-fossil fuel based co-generation projects are as under:

Renewable Energy Projects	SHR (kCal / kWh)
Biomass	a. 4200 : for project using travelling grate boilers; b. 4125 : for project using AFBC boilers.
Non-fossil fuel co-generation (for power component)	3600



FUEL

(a) Fuel Mix

59. Sub-Regulation (1) of Regulation 40 of the RE Tariff Regulations stipulates that the Biomass based power generating stations are to be designed in a way that it uses different types of non-fossil fuels available within the vicinity of biomass power project such as crop residues, agro-industrial residues, forest residues etc. and other biomass fuels as may be approved by the Ministry of Non-Renewable Energy (MNRE). Sub-Regulation (2) of the said Regulations stipulates that the biomass power generating companies are to ensure fuel management plan to ensure adequate availability of fuel to meet the respective project requirements.

60. Regulation 70 of the RE Tariff Regulations stipulates that the normative specific fuel consumption shall be 1.25 kg per kWh for Biomass Gasifier based power generating stations.

61. Regulation 81 of the RE Tariff Regulations stipulates that the normative specific fuel consumption shall be 3 kg of substrate mix per kWh for Biogas based power generating stations.

(b) Use of fossil fuel

62. As per Regulation 41 of the RE Tariff Regulations (First Amendment), the use of fossil fuel is not allowed.

(c) Calorific value

63. Regulation 43 of the RE Tariff (First Amendment) Regulations, provides the calorific value of biomass fuel used for determination of tariff shall be at 3100 kCal/kg.

64. Regulation 52 of the of the RE Tariff Regulations provides the gross calorific value for bagasse to be considered in case of non-fossil fuel co-generation projects is 2250 kCal/kg and for the use of biomass fuels other than bagasse, the calorific value as specified above shall be applicable.



(d) Fuel cost

65. The Commission, in terms of Regulation 44 of the RE Tariff Regulations, has specified the biomass fuel price applicable during the period 2012-13 and has specified fuel price indexation mechanism, in case developer wishes to opt, for the remaining years of the control period. The data for Pd and WPI, as per regulations, latest figures for April, 2013 and April, 2012 corresponding to n^{th} and $(n-1)^{\text{th}}$ year has been considered while calculating the fuel price indexation for biomass and also non-fossil fuel based co-generation power projects. The detailed computations of the fuel price indexation mechanism and the determination of the biomass fuel prices for FY 2014-15 thereof, has been enclosed as **Appendix-7** to this order. Accordingly, the biomass fuel price applicable for FY 2014-15 is as under:

State	Biomass price (₹/tonne)
Andhra Pradesh	2751.20
Haryana	3131.50
Maharashtra	3202.80
Punjab	3275.29
Rajasthan	2733.37
Tamil Nadu	2706.03
Uttar Pradesh	2798.73
Other States	2942.54

66. The Commission, in terms of Regulation 53 of the RE Tariff Regulations, has specified the price of bagasse applicable during the period 2012-13 and has specified fuel price indexation mechanism, in case developer wishes to opt, for the remaining years of the control period. The detailed computations of the fuel price indexation mechanism and the determination of the bagasse fuel prices for FY 2014-15 thereof, has been enclosed as **Appendix-8** of this Order. The price of bagasse (for non-fossil fuel based co-generation projects) applicable for FY 2014-15 shall be as in the table below;

State	Bagasse Price (₹/tonne)
Andhra Pradesh	1553.27
Haryana	2209.27
Maharashtra	2177.19
Punjab	1944.26
Tamil Nadu	1673.30
Uttar Pradesh	1732.72
Other States	1881.27

67. The Commission, in terms of Regulation 73 of the RE Tariff Regulations, has specified the biomass fuel price during first year of the Control Period (i.e. FY 2012-13) as per Regulation 44 and has specified fuel price indexation mechanism for the Biomass Gasifier project developer. Accordingly, the biomass fuel price for the Biomass gasifier based power project applicable for FY 2014-15 shall be the same as for the biomass based power project (Rankine cycle) as mentioned above. The detailed computations of the fuel price indexation mechanism and the determination of the biomass fuel prices for FY 2014-15 thereof, has been enclosed as **Appendix-9** of this Order.
68. The Commission, in terms of Regulation 82 of the RE Tariff Regulations, has specified the feed stock price during first year of the Control Period (i.e. FY 2012-13) at ₹ 990/MT(net of any cost recovery from digester effluent) and has specified fuel price indexation mechanism for the Biogas project developer. The detailed computations of the fuel price indexation mechanism and the determination of the bagasse fuel prices for FY 2014-15 thereof, has been enclosed as **Appendix-10** of this Order. The price of fuel applicable for the biogas based power plant for FY 2014-15 shall be at ₹ 1176.54/MT(net of any cost recovery from digester effluent).
69. In case of Biomass Power Projects, non-fossil fuel based co-generation projects, Biomass Gasifier based power Projects and Biogas based power projects, variable component of tariff is calculated based on the fuel cost for FY 2014-15. This variable component will change each year based on whether a Renewable Energy Power Project developer opts for fuel price indexation or escalation factor of 5%. Hence, while calculating the total applicable tariff for Biomass Power Projects, non-fossil fuel based co-generation

projects, Biomass Gasifier based power Projects and Biogas based power projects, levellisation of only fixed component is considered and the variable component for the first year of operation (i.e. 2014-15) is specified.

Subsidy or incentive by the Central / State Government

70. Regulation 22 of the RE Tariff Regulations provides as under:

“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:

i) 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.

ii) Capitalization of RE projects during second half of the fiscal year. Per unit benefit shall be derived on levellised basis at discount factor equivalent to Post Tax weighted average cost of capital”.

71. In terms of the above regulation, for the projects availing the benefit of accelerated depreciation as per applicable Income tax rate @ 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 (except for Wind energy generator, as per Income-tax (Fourth Amendment Rules), 2012, depreciation is now restricted to 15% on wind mills installed after 31-3-2012), Notification No. 15/2012 [F.No.149/21/2010-SO(TPL)] S.O.694(E), dated 30-3-2012). Moreover, additional 20% depreciation in the initial year is proposed to be extended to new assets acquired by



power generation companies vide amendment in the section 32, sub-section (1) clause (ia) of the Income Tax Act.

72. Depreciation for the first year has been calculated at the rate of 50% of accelerated depreciation 80% and 50% of additional depreciation 20% (as project is capitalized during the second half of the financial year as per proviso (ii) to Regulation 22). Income tax benefits of accelerated depreciation and additional depreciation, 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 post tax weighted average cost of capital as discount factor.

73. In the light of the discussion made in the preceding paragraphs, the generic tariffs of the following RE projects for the financial year 2014-15 have been determined as under:

Generic Tariff for RE Technologies for FY 2014-15

Particular	Levelled Total Tariff (FY 2014-15)	Benefit of Accelerated Depreciation (if availed)	Net Levelled Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
	(₹ / kWh)	(₹/kWh)	(₹/kWh)
Wind Energy			
Wind Zone -1 (CUF 20%)	6.34	0.34	6.00
Wind Zone -2 (CUF 22%)	5.76	0.31	5.45
Wind Zone -3 (CUF 25%)	5.07	0.28	4.79
Wind Zone -4 (CUF 30%)	4.23	0.23	4.00
Wind Zone -5 (CUF 32%)	3.96	0.22	3.74
Small Hydro Power Project			
HP, Uttarakhand and NE States (Below 5MW)	4.46	0.36	4.10
HP, Uttarakhand and NE States (5MW to 25 MW)	3.80	0.33	3.47
Other States (Below 5 MW)	5.25	0.43	4.82
Other States (5 MW to 25 MW)	4.47	0.39	4.08



State	Levelling Fixed Cost	Variable Cost (FY 2014-15)	Applicable Tariff Rate (FY 2014-15)	Benefit of Accelerated Depreciation (if availed)	Net Levelled Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
	(₹/kWh)	(₹/kWh)	(₹/kWh)	(₹/kWh)	(₹/kWh)
Biomass Power Projects [other than Rice Straw and Juliflora (plantation) based project] with Water Cooled Condenser and using Travelling Grate boiler					
Andhra Pradesh	2.91	4.19	7.10	0.17	6.93
Haryana	2.97	4.77	7.73	0.17	7.56
Maharashtra	2.98	4.88	7.85	0.17	7.68
Punjab	2.99	4.99	7.97	0.17	7.80
Rajasthan	2.91	4.16	7.07	0.17	6.90
Tamil Nadu	2.90	4.12	7.02	0.17	6.85
Uttar Pradesh	2.92	4.26	7.18	0.17	7.01
Others	2.94	4.48	7.42	0.17	7.25
Bagasse Based Co-generation Project					
Andhra Pradesh	3.01	2.72	5.73	0.24	5.49
Haryana	2.71	3.86	6.57	0.21	6.36
Maharashtra	2.43	3.81	6.24	0.18	6.06
Punjab	2.66	3.40	6.06	0.21	5.85
Tamil Nadu	2.35	2.93	5.27	0.18	5.09
Uttar Pradesh	3.04	3.03	6.07	0.24	5.83
Others	2.65	3.29	5.94	0.21	5.73



Solar PV and Solar Thermal			
Particular	Levellised Total Tariff (FY 2014-15)	Benefit of Accelerated Depreciation (if availed)	Net Levellised Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
	(₹/kWh)	(₹/kWh)	(₹/kWh)
Solar PV	7.72	0.77	6.95
Solar Thermal	11.88	1.23	10.65

State	Levellised Fixed Cost	Variable Cost (FY 2014-15)	Applicable Tariff Rate (FY 2014-15)	Benefit of Accelerated Depreciation (if availed)	Net Levellised Tariff (upon adjusting for Accelerated Depreciation benefit) (if availed)
	(₹/kWh)	(₹/kWh)	(₹/kWh)	(₹/kWh)	(₹/kWh)
Biomass Gasifier Power Project					
Andhra Pradesh	2.44	3.82	6.26	0.13	6.13
Haryana	2.49	4.35	6.84	0.13	6.71
Maharashtra	2.50	4.45	6.95	0.13	6.82
Punjab	2.51	4.55	7.06	0.13	6.93
Rajasthan	2.44	3.80	6.24	0.13	6.11
Tamil Nadu	2.44	3.76	6.19	0.13	6.06
Uttar Pradesh	2.45	3.89	6.34	0.13	6.21
Others	2.47	4.09	6.55	0.13	6.42
Biogas based Generation					
Biogas	3.39	4.01	7.40	0.25	7.15



74. The detailed computations for the generic tariff for various RE technologies have been enclosed to 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
	Wind Zone V	Annexure 1E
B	Small Hydro Power Projects	
	Projects Less than 5 MW for HP, Uttarakhand and NE States	Annexure 2A
	Projects between 5 MW and 25 MW for HP, Uttarakhand and NE States	Annexure 2B
	Projects less than 5 MW for other States	Annexure 2C
	Projects between 5 MW and 25 MW for other States	Annexure 2D
C	Biomass Power Projects [other than Rice Straw and Juliflora (plantation) based project] with Water Cooled Condenser and using Travelling Grate boiler	
	Andhra Pradesh	Annexure 3A
	Haryana	Annexure 3B
	Maharashtra	Annexure 3C
	Punjab	Annexure 3D
	Rajasthan	Annexure 3E
	Uttar Pradesh	Annexure 3F
	Tamil Nadu	Annexure 3G



S No	Renewable Energy Projects	Annexure
	Others	Annexure 3H
D	Non-Fossil Fuel Based Cogeneration	
	Andhra Pradesh	Annexure 4A
	Haryana	Annexure 4B
	Maharashtra	Annexure 4C
	Punjab	Annexure 4D
	Uttar Pradesh	Annexure 4E
	Tamil Nadu	Annexure 4F
	Others	Annexure 4G
E	Solar Projects	
	Solar PV Projects	Annexure 5A
	Solar Thermal Projects	Annexure 6A
F	Biomass Gasifier Power Projects	
	Andhra Pradesh	Annexure 7A
	Haryana	Annexure 7B
	Maharashtra	Annexure 7C
	Punjab	Annexure 7D
	Rajasthan	Annexure 7E
	Uttar Pradesh	Annexure 7F
	Tamil Nadu	Annexure 7G
	Others	Annexure 7H
G	Biogas based Power Projects	Annexure 8A

Sd/-
(Neerja Mathur)
Member (E.O.)

Sd/-
(A. K. Singhal)
Member

Sd/-
(M. Deena Dayalan)
Member

Sd/-
(Gireesh B. Pradhan)
Chairperson

New Delhi
Dated the 15th May, 2014



Capital cost of Indexation for Wind Power Projects (FY 2014-15)

Indexation Formulation

$$CC_{(n)} = P\&M_{(n)} * [1 + F1 + F2 + F3]$$

$$d_{(n)} = (a * (SI_{(n-1)}/SI_{(0)})-1) + b * (EI_{(n-1)}/EI_{(0)})-1) / (a+b)$$

$$P\&M_{(n)} = P\&M_{(0)} * (1 + d_{(n)})$$

Variable	Description	Value
a	Weightage for Steel Index	0.60
b	Weightage for Electrical Machinery Index	0.40
F1	Factor for Land and Civil Work	0.08
F2	Factor for Erection and Commissioning	0.07
F3	Factor for IDC and Financing	0.10

Month/Year	Electrical Machinery		Steel	
	2013	2011	2013	2011
January	133.900	125.100	126.200	118.600
February	133.800	125.100	126.200	113.000
March	134.100	126.400	126.200	113.000
April	134.500	127.200	126.200	113.000
May	135.500	127.600	126.200	113.000
June	135.600	128.000	126.200	119.600
July	135.600	128.700	126.200	126.200
August	135.700	129.200	126.200	126.200
September	136.300	130.900	126.200	126.200
October	137.100	130.600	126.200	126.200
November	137.500	130.800	126.200	126.200
December	137.800	131.000	126.200	126.200
Average	135.617	128.383	126.200	120.617

Parameters	Description	Value
CC ₍₀₎ (₹ L/MW)	Capital Cost for the Base Year	575.000
P&M ₍₀₎ (₹ L/MW)	Plant & Machinery Cost for the Base Year	460.000
d _(n)	Capital Cost escalation Factor	5.031%
P&M _(n) (₹ L/MW)	Plant & Machinery Cost for the nth Year (FY 2014-15)	483.143
CC _(n) (₹ L/MW)	Capital Cost for the nth Year (FY 2014-15)	603.929

Source of WPI (Steel and Electrical Machinery): Office of Economic Advisor, Ministry of Commerce and Industry (www.eaindustry.nic.in)

Capital cost of Indexation for Small Hydro Power Projects (FY 2014-15)

<p>Indexation Formulation</p> $CC_{(n)} = P\&M_{(n)} * [1 + F1 + F2 + F3]$ $d_{(n)} = (a * (SI_{(n-1)}/SI_{(0)})-1) + b * (EI_{(n-1)}/EI_{(0)})-1) / (a+b)$ $P\&M_{(n)} = P\&M_{(0)} * (1 + d_{(n)})$

Variable	Description	Value
a	Weightage for Steel Index	0.60
b	Weightage for Electrical Machinery Index	0.40
F1	Factor for Land and Civil Work	0.16
F2	Factor for Erection and Commissioning	0.10
F3	Factor for IDC and Financing	0.14

Month/Year	Electrical Machinery		Steel	
	2013	2011	2013	2011
January	133.900	125.100	126.200	118.600
February	133.800	125.100	126.200	113.000
March	134.100	126.400	126.200	113.000
April	134.500	127.200	126.200	113.000
May	135.500	127.600	126.200	113.000
June	135.600	128.000	126.200	119.600
July	135.600	128.700	126.200	126.200
August	135.700	129.200	126.200	126.200
September	136.300	130.900	126.200	126.200
October	137.100	130.600	126.200	126.200
November	137.500	130.800	126.200	126.200
December	137.800	131.000	126.200	126.200
Average	135.617	128.383	126.200	120.617

Parameters	Description	HP/Uttarakhand/NE		Other States	
		SHP <5 MW	5MW-25 MW	SHP<5 MW	5MW-25 MW
CC ₍₀₎ (₹ L/MW)	Capital Cost for the Base Year	770.000	700.000	600.000	550.000
P&M ₍₀₎ (₹ L/MW)	Plant & Machinery Cost for the Base Year	550.000	500.000	428.571	392.857
d _(n)	Capital Cost escalation Factor	5.031%	5.031%	5.031%	5.031%
P&M _(n) (₹ L/MW)	Plant & Machinery Cost for the nth Year (FY 14-15)	577.671	525.155	450.133	412.622
CC _(n) (₹ L/MW)	Capital Cost for the nth Year (FY 2014-15)	808.739	735.217	630.186	577.671

Source of WPI (Steel and Electrical Machinery): Office of Economic Advisor, Ministry of Commerce and Industry (www.eaindustry.nic.in)



Capital cost of Indexation for Biomass Power Projects (FY 2014-15)

Indexation Formulation

$$CC_{(n)} = P\&M_{(n)} * [1 + F1 + F2 + F3]$$

$$d_{(n)} = (a * (SI_{(n-1)}/SI_{(0)})-1) + b * (EI_{(n-1)}/EI_{(0)})-1) / (a+b)$$

$$P\&M_{(n)} = P\&M_{(0)} * (1 + d_{(n)})$$

Variable	Description	Value
a	Weightage for Steel Index	0.7
b	Weightage for Electrical Machinery Index	0.3
F1	Factor for Land and Civil Work	0.10
F2	Factor for Erection and Commissioning	0.09
F3	Factor for IDC and Financing	0.14

Month/Year	Electrical Machinery		Steel	
	2013	2012	2013	2012
January	133.900	130.900	126.200	126.200
February	133.800	130.900	126.200	126.200
March	134.100	130.900	126.200	126.200
April	134.500	130.700	126.200	126.200
May	135.500	131.200	126.200	126.200
June	135.600	132.200	126.200	126.200
July	135.600	133.000	126.200	126.200
August	135.700	133.200	126.200	126.200
September	136.300	133.100	126.200	126.200
October	137.100	133.100	126.200	126.200
November	137.500	133.600	126.200	126.200
December	137.800	133.600	126.200	126.200
Average	135.617	132.200	126.200	126.200

Parameters	Description	Biomass Power Projects (Rankine Cycle)			
		a*	b*	c*	d*
CC ₍₀₎ (₹ L/MW)	Capital Cost for the Base Year : (FY 13-14)	540.000	580.000	590.000	630.000
P&M ₍₀₎ (₹ L/MW)	Plant & Machinery Cost for the Base Year: (FY 13-14)	406.015	436.090	443.609	473.684
d _(n)	Capital Cost escalation Factor	0.775%	0.775%	0.775%	0.775%
P&M _(n) (₹ L/MW)	Plant & Machinery Cost for the nth Year (FY 14-15)	409.163	439.471	447.049	477.357
CC _(n) (₹ L/MW)	Capital Cost for the nth Year (FY 2014-15)	544.187	584.497	594.575	634.885

Source of WPI (Steel and Electrical Machinery): Office of Economic Advisor, Ministry of Commerce and Industry (www.eaindustry.nic.in)

- * a. Project [other than rice straw and juliflora (plantation) based project] with water cooled condenser;
- b. Project [other than rice straw and Juliflora (plantation) based project] with air cooled condenser;
- c. For rice straw and juliflora (plantation) based project with water cooled condenser;
- d. For rice straw and juliflora (plantation) based project with air cooled condenser.



Capital cost of Indexation for Non-fossil fuel based Cogeneration Power Projects (FY 14-15)

Indexation Formulation

$$CC_{(n)} = P\&M_{(n)} * [1 + F1 + F2 + F3]$$

$$d_{(n)} = (a * (SI_{(n-1)}/SI_{(0)})-1) + b * (EI_{(n-1)}/EI_{(0)})-1) / (a+b)$$

$$P\&M_{(n)} = P\&M_{(0)} * (1 + d_{(n)})$$

Variable	Description	Value
a	Weightage for Steel Index	0.7
b	Weightage for Electrical Machinery Index	0.3
F1	Factor for Land and Civil Work	0.1
F2	Factor for Erection and Commissioning	0.09
F3	Factor for IDC and Financing	0.14

Month/Year	Electrical Machinery		Steel	
	2013	2011	2013	2011
January	133.900	125.100	126.200	118.600
February	133.800	125.100	126.200	113.000
March	134.100	126.400	126.200	113.000
April	134.500	127.200	126.200	113.000
May	135.500	127.600	126.200	113.000
June	135.600	128.000	126.200	119.600
July	135.600	128.700	126.200	126.200
August	135.700	129.200	126.200	126.200
September	136.300	130.900	126.200	126.200
October	137.100	130.600	126.200	126.200
November	137.500	130.800	126.200	126.200
December	137.800	131.000	126.200	126.200
Average	135.617	128.383	126.200	120.617

Parameters	Description	Value
CC ₍₀₎ (₹ L/MW)	Capital Cost for the Base Year	420.000
P&M ₍₀₎ (₹ L/MW)	Plant & Machinery Cost for the Base Year	315.789
d _(n)	Capital Cost escalation Factor	4.931%
P&M _(n) (₹ L/MW)	Plant & Machinery Cost for the nth Year (FY 2014-15)	331.360
CC _(n) (₹ L/MW)	Capital Cost for the nth Year (FY2014-15)	440.708

Source of WPI (Steel and Electrical Machinery): Office of Economic Advisor, Ministry of Commerce and Industry (www.eaindstry.nic.in)



Capital cost of Indexation for Biomass Gasifier Power Projects (FY 2014-15)

Indexation Formulation

$$CC_{(n)} = P\&M_{(n)} * [1 + F1 + F2 + F3]$$

$$d_{(n)} = (a * (SI_{(n-1)}/SI_{(0)})-1) + b * (EI_{(n-1)}/EI_{(0)})-1) / (a+b)$$

$$P\&M_{(n)} = P\&M_{(0)} * (1 + d_{(n)})$$

Variable	Description	Value
a	Weightage for Steel Index	0.7
b	Weightage for Electrical Machinery Index	0.3
F1	Factor for Land and Civil Work	0.1
F2	Factor for Erection and Commissioning	0.09
F3	Factor for IDC and Financing	0.14

Month/Year	Electrical & Machinery		Iron & Steel	
	2013	2011	2013	2011
January	133.900	125.100	126.200	118.600
February	133.800	125.100	126.200	113.000
March	134.100	126.400	126.200	113.000
April	134.500	127.200	126.200	113.000
May	135.500	127.600	126.200	113.000
June	135.600	128.000	126.200	119.600
July	135.600	128.700	126.200	126.200
August	135.700	129.200	126.200	126.200
September	136.300	130.900	126.200	126.200
October	137.100	130.600	126.200	126.200
November	137.500	130.800	126.200	126.200
December	137.800	131.000	126.200	126.200
Average	135.617	128.383	126.200	120.617

Parameters	Description	Value
CC ₍₀₎ (₹ L/MW)	Capital Cost for the Base Year	550.000
P&M ₍₀₎ (₹ L/MW)	Plant & Machinery Cost for the Base Year	413.534
d _(n)	Capital Cost escalation Factor	4.931%
P&M _(n) (₹ L/MW)	Plant & Machinery Cost for the nth Year (FY 2014-15)	433.923
CC _(n) (₹ L/MW)	Capital Cost for the nth Year (FY2014-15)	577.118

Source of WPI (Steel and Electrical Machinery): Office of Economic Advisor, Ministry of Commerce and Industry (www.eaindstry.nic.in)



Capital cost of Indexation for Biogas based Power Projects (FY 2014-15)

<p>Indexation Formulation</p> $CC_{(n)} = P\&M_{(n)} * [1 + F1 + F2 + F3]$ $d_{(n)} = (a * (SI_{(n-1)}/SI_{(0)})-1) + b * (EI_{(n-1)}/EI_{(0)})-1) / (a+b)$ $P\&M_{(n)} = P\&M_{(0)} * (1 + d_{(n)})$

Variable	Description	Value
A	Weightage for Steel Index	0.7
B	Weightage for Electrical Machinery Index	0.3
F1	Factor for Land and Civil Work	0.1
F2	Factor for Erection and Commissioning	0.09
F3	Factor for IDC and Financing	0.14

Month/Year	Electrical Machinery		Steel	
	2013	2011	2013	2011
January	133.900	125.100	126.200	118.600
February	133.800	125.100	126.200	113.000
March	134.100	126.400	126.200	113.000
April	134.500	127.200	126.200	113.000
May	135.500	127.600	126.200	113.000
June	135.600	128.000	126.200	119.600
July	135.600	128.700	126.200	126.200
August	135.700	129.200	126.200	126.200
September	136.300	130.900	126.200	126.200
October	137.100	130.600	126.200	126.200
November	137.500	130.800	126.200	126.200
December	137.800	131.000	126.200	126.200
Average	135.617	128.383	126.200	120.617

Parameters	Description	Value
$CC_{(0)}$ (₹ L/MW)	Capital Cost for the Base Year	1100.000
$P\&M_{(0)}$ (₹ /MW)	Plant & Machinery Cost for the Base Year	827.068
$d_{(n)}$	Capital Cost escalation Factor	4.931%
$P\&M_{(n)}$ (₹ L/MW)	Plant & Machinery Cost for the nth Year (FY 2014-15)	867.847
$CC_{(n)}$ (₹ L/MW)	Capital Cost for the nth Year (FY2014-15)	1154.236

Source of WPI (Steel and Electrical Machinery): Office of Economic Advisor, Ministry of Commerce and Industry (www.eaindustry.nic.in)



Biomass Fuel Price across States for FY 2014-15

As per fuel price Index Mechanism outlined under Regulation 45 and the availability of required information

Fuel Price indexation for Biomass Power Projects (FY2014-15)

Indexation Formulation	
$P_{(n)} = P_{(n-1)} * \{a * (WPI_{(n)}/WPI_{(n-1)}) + b * (1 + IRC_{(n-1)}) + c * (Pd_{(n)}/Pd_{(n-1)})\}$	
Parameter	Value
WPI n-1	163.500
WPI n	171.300
IRC n-1	9.81%
Pd n-1	175.242
Pd n	210.908
A	0.20
B	0.60
C	0.20

State	Biomass price (₹ /MT) (2013-14)	Biomass price (₹ /MT) (2014-15)
Andhra Pradesh	2480.55	2751.20
Haryana	2823.44	3131.50
Maharashtra	2887.73	3202.80
Punjab	2953.09	3275.29
Rajasthan	2464.48	2733.37
Tamil Nadu	2439.83	2706.03
Uttar Pradesh	2523.41	2798.73
Other States	2653.07	2942.54

Note:

1. The Calculation of WPI (n) and WPI (n-1) is based on the figures available on April 2013 and April 2012 respectively.
2. The Calculation of Pd (n) is based on the weighted average of the WPI (Price of HSD) figures available for the months from January 2013 to December 2013.
3. The Calculation of Pd (n-1) is based on the weighted average of the WPI (Price of HSD) figures available for the months from January 2012 to December 2012.



4. The Calculation of Pd (n) and Pd (n-1) are shown as under:

WPI (Price of HSD)

Month	2013	2012
Jan	198.800	167.800
Feb	202.700	167.800
Mar	201.700	167.800
Apr	202.300	167.800
May	203.400	167.800
Jun	207.000	167.800
Jul	212.000	167.800
Aug	215.400	168.600
Sep	219.800	182.800
Oct	220.400	192.300
Nov	222.400	192.300
Dec	225.000	192.300
Average	Pd (n) :210.908	Pd (n-1) : 175.242

Source of WPI and WPI (Price of HSD): Office of Economic Advisor, Ministry of Commerce and Industry (www.eaindustry.nic.in),

From	To	IRC	Days	Average IRC
01-04-2013	30-09-2013	9.82%	183	9.81%
01-10-2013	31-03-2014	9.80%	182	
Total			365	

Source of IRC: CERC (www.cercind.gov.in)



bagasse Fuel Price across States for FY 2014-15

As per fuel price Index Mechanism outlined under Regulation 54 and the availability of required information

Fuel Price indexation for Bagasse Power Projects (FY2014-14)

Indexation Formulation	
$P_{(n)} = P_{(n-1)} * \{a * (WPI_{(n)} / WPI_{(n-1)}) + b * (1 + IRC_{(n-1)}) + c * (Pd_{(n)} / Pd_{(n-1)})\}$	
Parameter	Value
WPI _(n-1)	163.500
WPI _(n)	171.300
IRC _(n-1)	9.81%
Pd _(n-1)	175.242
Pd _(n)	210.908
A	0.20
B	0.60
C	0.20

State	Bagasse price (₹/MT) (2013-14)	Bagasse price (₹/MT) (2014-15)
Andhra Pradesh	1400.47	1553.27
Haryana	1991.94	2209.27
Maharashtra	1963.01	2177.19
Punjab	1753.00	1944.26
Tamil Nadu	1508.69	1673.30
Uttar Pradesh	1562.27	1732.72
Other States	1696.20	1881.27

Note:

1. The Calculation of WPI (n) and WPI (n-1) is based on the figures available on April 2013 and April 2012 respectively.
2. The Calculation of Pd (n) is based on the weighted average of the WPI (Price of HSD) figures available for the months from January 2013 to December 2013.
3. The Calculation of Pd (n-1) is based on the weighted average of the WPI (Price of HSD) figures available for the months from January 2012 to December 2012.
4. The Calculation of Pd (n) and Pd (n-1) are shown as under:



WPI (Price of HSD)

Month	2013	2012
Jan	198.800	167.800
Feb	202.700	167.800
Mar	201.700	167.800
Apr	202.300	167.800
May	203.400	167.800
Jun	207.000	167.800
Jul	212.000	167.800
Aug	215.400	168.600
Sep	219.800	182.800
Oct	220.400	192.300
Nov	222.400	192.300
Dec	225.000	192.300
Average	Pd (n) :210.908	Pd (n-1) : 175.242

Source of WPI and WPI (Price of HSD): Office of Economic Advisor, Ministry of Commerce and Industry (www.eaindustry.nic.in),

From	To	IRC	Days	Average IRC
01-04-2013	30-09-2013	9.82%	183	9.81%
01-10-2013	31-03-2014	9.81%	182	
Total			365	

Source of IRC: CERC (www.cercind.gov.in)



Biomass Gasifier Fuel Price across States for FY 2014-15

As per fuel price Index Mechanism outlined under Regulation 74 and the availability of required information

Fuel Price indexation for Biomass gasifier Power Projects (FY2014-15)

Indexation Formulation	
$P_{(n)} = P_{(n-1)} * \{a * (WPI_{(n)}/WPI_{(n-1)}) + b * (1 + IRC_{(n-1)}) + c * (Pd_{(n)}/Pd_{(n-1)})\}$	
Parameter	Value
WPI _(n-1)	163.500
WPI _(n)	171.300
IRC _(n-1)	9.81%
Pd _(n-1)	175.242
Pd _(n)	210.908
A	0.20
B	0.60
C	0.20

State	Biomass price (₹ /MT) (2013-14)	Biomass price (₹ /MT) (2014-15)
Andhra Pradesh	2480.55	2751.20
Haryana	2823.44	3131.50
Maharashtra	2887.73	3202.80
Punjab	2953.09	3275.29
Rajasthan	2464.48	2733.37
Tamil Nadu	2439.83	2706.03
Uttar Pradesh	2523.41	2798.73
Other States	2653.07	2942.54

Note:

1. The Calculation of WPI (n) and WPI (n-1) is based on the figures available on April 2013 and April 2012 respectively.
2. The Calculation of Pd (n) is based on the weighted average of the WPI (Price of HSD) figures available for the months from January 2013 to December 2013.
3. The Calculation of Pd (n-1) is based on the weighted average of the WPI (Price of HSD) figures available for the months from January 2012 to December 2012.
4. The Calculation of Pd (n) and Pd (n-1) are shown as under:



WPI (Price of HSD)

Month	2013	2012
Jan	198.800	167.800
Feb	202.700	167.800
Mar	201.700	167.800
Apr	202.300	167.800
May	203.400	167.800
Jun	207.000	167.800
Jul	212.000	167.800
Aug	215.400	168.600
Sep	219.800	182.800
Oct	220.400	192.300
Nov	222.400	192.300
Dec	225.000	192.300
Average	Pd (n) :210.908	Pd (n-1) : 175.242

Source of WPI and WPI (Price of HSD): Office of Economic Advisor, Ministry of Commerce and Industry (www.eaindustry.nic.in),

From	To	IRC	Days	Average IRC
01-04-2013	30-09-2013	9.82%	183	
01-10-2013	31-03-2014	9.81%	182	9.81%
			Total	365

Source of IRC: CERC (www.cercind.gov.in)



Fuel Price for biogas based power plant for FY 2014-15

As per fuel price Index Mechanism outlined under Regulation 83 and the availability of required information

Fuel Price indexation for Biogas based power projects (FY2014-15)

Indexation Formulation	
$P_{(n)} = P_{(n-1)} * \{a * (WPI_{(n)} / WPI_{(n-1)}) + b * (1 + IRC_{(n-1)}) + c * (Pd_{(n)} / Pd_{(n-1)})\}$	
Parameter	Value
WPI _(n-1)	163.500
WPI _(n)	171.300
IRC _(n-1)	9.81%
Pd _(n-1)	175.242
Pd _(n)	210.908
A	0.20
B	0.60
C	0.20

Fuel price (₹ /MT) (2013-14)	Fuel price (₹ /MT) (2014-15)
1060.80	1176.54

Note:

1. The Calculation of WPI (n) and WPI (n-1) is based on the figures available on April 2013 and April 2012 respectively.
2. The Calculation of Pd (n) is based on the weighted average of the WPI (Price of HSD) figures available for the months from January 2013 to December 2013.
3. The Calculation of Pd (n-1) is based on the weighted average of the WPI (Price of HSD) figures available for the months from January 2012 to December 2012.
4. The Calculation of Pd (n) and Pd (n-1) are shown as under:

WPI (Price of HSD)

Month	2013	2012
Jan	198.800	167.800
Feb	202.700	167.800
Mar	201.700	167.800
Apr	202.300	167.800
May	203.400	167.800
Jun	207.000	167.800
Jul	212.000	167.800
Aug	215.400	168.600
Sep	219.800	182.800
Oct	220.400	192.300
Nov	222.400	192.300
Dec	225.000	192.300
Average	Pd (n) :210.908	Pd (n-1) : 175.242

Source of WPI and WPI (Price of HSD): Office of Economic Advisor, Ministry of Commerce and Industry (www.eaindustry.nic.in),

From	To	IRC	Days	Average IRC
01-04-2013	30-09-2013	9.82%	183	
01-10-2013	31-03-2014	9.81%	182	9.81%
			Total	365

Source of IRC: CERC (www.cercind.gov.in)



Assumptions: Wind Energy Projects						
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Wind Zone 1	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	20%	
			Useful Life	Years	25	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	603.929	
3	Sources of Fund	Debt: Equity	Tariff Period	Years	13	
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	422.750	
			Total Equity Amount	Rs Lacs	181.179	
			Debt Component		Loan Amount	Rs Lacs
				Moratorium Period	years	0
				Repayment Period(incld Moratorium)	years	12
				Interest Rate	%	12.70%
		Equity Component		Equity amount	Rs Lacs	181.18
				Return on Equity for first 10 years	% p.a	20.00%
				Return on Equity 11th year onwards	% p.a	24.00%
		Weighted average of ROE		22.40%		
		Discount Rate		10.67%		
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%	
			Depreciation			
			Depreciation Rate for first 12 years	%	5.83%	
		Depreciation Rate 13th year onwards	%	1.54%		
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	%	13.20%	
6	Operation & Maintenance	O & M (FY14-15)		Rs Lacs/MW	10.05	
			Total O & M Expenses Escalation	%	5.72%	
			O & M (FY13-14)	Rs Lacs/MW	9.51	



Determination of Tariff																											
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		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	38.20
Depreciation	Rs Lakh		35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31
Interest on term loan	Rs Lakh		51.45	46.98	42.50	38.03	33.56	29.08	24.61	20.13	15.66	11.19	6.71	2.24	0.00	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	3.24	3.17	3.10	3.04	2.98	2.92	2.86	2.81	2.75	2.87	2.82	2.25	2.31	2.37	2.44	2.51	2.58	2.66	2.75	2.84	2.93	3.03	3.14	3.25
Return on Equity	Rs Lakh		36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48
Total Fixed Cost	Rs Lakh		136.26	132.29	128.36	124.46	120.60	116.78	113.01	109.28	105.60	101.97	105.81	102.29	74.64	75.82	77.07	78.39	79.78	81.26	82.82	84.47	86.21	88.06	90.01	92.07	94.25
Levallised tariff corresponding to Useful life																											
Per Unit Cost of Generation	Unit	Levllise	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	0.92	0.57	0.61	0.64	0.68	0.72	0.76	0.80	0.85	0.90	0.95	1.00	1.06	1.12	1.18	1.25	1.32	1.40	1.48	1.56	1.65	1.75	1.85	1.95	2.06	2.18
Depreciation	Rs/kWh	1.66	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53
Int. on term loan	Rs/kWh	1.40	2.94	2.68	2.43	2.17	1.92	1.66	1.40	1.15	0.89	0.64	0.38	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.17	0.19	0.18	0.18	0.18	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.13	0.13	0.14	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.17	0.18	0.19
RoE	Rs/kWh	2.20	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48
Total COG	Rs/kWh	6.34	7.78	7.55	7.33	7.10	6.88	6.67	6.45	6.24	6.03	5.82	6.04	5.84	4.26	4.33	4.40	4.47	4.55	4.64	4.73	4.82	4.92	5.03	5.14	5.26	5.38
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146	0.132	0.119	0.108	0.097	0.088
Levllised Tariff	6.34	Rs/Unit																									



Determination of Accelerated Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	15%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost Rs. Lakh	603.929

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	15.94	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	17.39	0.00	0.00
Accelerated Depreciation																					
Opening	%	100.00%	82.50%	61.88%	52.59%	44.70%	38.00%	32.30%	27.45%	23.34%	19.84%	16.86%	14.33%	12.18%	10.35%	8.80%	7.48%	6.36%	5.41%	4.59%	3.91%
Allowed during the year	%	17.50%	20.63%	9.28%	7.89%	6.71%	5.70%	4.84%	4.12%	3.50%	2.98%	2.53%	2.15%	1.83%	1.55%	1.32%	1.12%	0.95%	0.81%	0.69%	0.59%
Closing	%	83%	62%	52.59%	44.70%	38.00%	32.30%	27.45%	23.34%	19.84%	16.86%	14.33%	12.18%	10.35%	8.80%	7.48%	6.36%	5.41%	4.59%	3.91%	3.32%
Accelerated Depn.	Rs Lakh	105.69	124.56	56.05	47.64	40.50	34.42	29.26	24.87	21.14	17.97	15.27	12.98	11.04	9.38	7.97	6.78	5.76	4.90	4.16	3.54
Net Depreciation Benefit	Rs Lakh	89.74	92.67	24.16	15.76	8.61	2.54	-2.63	-7.02	-10.75	-13.92	-16.61	-18.90	-20.85	-22.51	-23.91	-25.11	-26.13	-12.50	4.16	3.54
Tax Benefit	Rs Lakh	30.50	31.50	8.21	5.36	2.93	0.86	-0.89	-2.39	-3.65	-4.73	-5.65	-6.43	-7.09	-7.65	-8.13	-8.54	-8.88	-4.25	1.41	1.20
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
Per unit benefit	Rs/Unit	3.48	1.80	0.47	0.31	0.17	0.05	-0.05	-0.14	-0.21	-0.27	-0.32	-0.37	-0.40	-0.44	-0.46	-0.49	-0.51	-0.24	0.08	0.07
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15
Levellised benefit	0.34	Rs/Unit																			



Assumptions: Wind Energy Projects					
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Wind Zone 2
1	Power Generation	<u>Capacity</u>	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	22%
			Useful Life	Years	25
2	Project Cost	<u>Capital Cost/MW</u>	Power Plant Cost	Rs Lacs/MW	603.929
3	Sources of Fund	<u>Debt: Equity</u>	Tariff Period	Years	13
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	422.750
			Total Equity Amount	Rs Lacs	181.179
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	422.75
			Moratorium Period	years	0
			Repayment Period(incl'd Moratorium)	years	12
			Interest Rate	%	12.70%
			<u>Equity Component</u>		
Equity amount	Rs Lacs	181.18			
Return on Equity for first 10 years	% p.a	20.00%			
Return on Equity 11th year onwards	% p.a	24.00%			
Weighted average of ROE		22.40%			
Discount Rate		10.67%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%
			<u>Depreciation</u>		
			Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13th year onwards	%	1.54%
5	Working Capital	<u>For Fixed Charges</u>	O&M Charges	Months	1
			Maintenance Spare	(% of O&M exepenses)	15%
			Receivables for Debtors	Months	2
			<u>For Variable Charges</u>		
			Interest On Working Capital	%	13.20%
6	Operation & Maintenance	<u>O & M (FY14-15)</u>		Rs Lacs/MW	10.05
			<u>Total O & M Expenses Escalation</u>	%	5.72%
			<u>O & M (FY13-14)</u>	Rs Lacs/MW	9.51



Determination of Tariff																											
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		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	38.20
Depreciation	Rs Lakh		35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31
Interest on term loan	Rs Lakh		51.45	46.98	42.50	38.03	33.56	29.08	24.61	20.13	15.66	11.19	6.71	2.24	0.00	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	3.24	3.17	3.10	3.04	2.98	2.92	2.86	2.81	2.75	2.87	2.82	2.25	2.31	2.37	2.44	2.51	2.58	2.66	2.75	2.84	2.93	3.03	3.14	3.25
Return on Equity	Rs Lakh		36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48
Total Fixed Cost	Rs Lakh		136.26	132.29	128.36	124.46	120.60	116.78	113.01	109.28	105.60	101.97	105.81	102.29	74.64	75.82	77.07	78.39	79.78	81.26	82.82	84.47	86.21	88.06	90.01	92.07	94.25
Levelling 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	0.83	0.52	0.55	0.58	0.62	0.65	0.69	0.73	0.77	0.81	0.86	0.91	0.96	1.02	1.08	1.14	1.20	1.27	1.34	1.42	1.50	1.59	1.68	1.77	1.88	1.98
Depreciation	Rs/kWh	1.51	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Int. on term loan	Rs/kWh	1.27	2.67	2.44	2.21	1.97	1.74	1.51	1.28	1.04	0.81	0.58	0.35	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.15	0.17	0.17	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.14	0.15	0.15	0.12	0.12	0.12	0.13	0.13	0.13	0.14	0.14	0.15	0.15	0.16	0.16	0.17
RoE	Rs/kWh	2.00	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26
Total COG	Rs/kWh	5.76	7.07	6.86	6.66	6.46	6.26	6.06	5.86	5.67	5.48	5.29	5.49	5.31	3.87	3.93	4.00	4.07	4.14	4.22	4.30	4.38	4.47	4.57	4.67	4.78	4.89
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146	0.132	0.119	0.108	0.097	0.088
Levelling Tariff	5.76	Rs/Unit																									



Determination of Accelerated Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	15%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost Rs. Lakh	603.929

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	15.94	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	17.39	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	82.50%	61.88%	52.59%	44.70%	38.00%	32.30%	27.45%	23.34%	19.84%	16.86%	14.33%	12.18%	10.35%	8.80%	7.48%	6.36%	5.41%	4.59%	3.91%
Allowed during the year	%	17.50%	20.63%	9.28%	7.89%	6.71%	5.70%	4.84%	4.12%	3.50%	2.98%	2.53%	2.15%	1.83%	1.55%	1.32%	1.12%	0.95%	0.81%	0.69%	0.59%
Closing	%	83%	62%	52.59%	44.70%	38.00%	32.30%	27.45%	23.34%	19.84%	16.86%	14.33%	12.18%	10.35%	8.80%	7.48%	6.36%	5.41%	4.59%	3.91%	3.32%
Accelerated Deprn.	Rs Lakh	105.69	124.56	56.05	47.64	40.50	34.42	29.26	24.87	21.14	17.97	15.27	12.98	11.04	9.38	7.97	6.78	5.76	4.90	4.16	3.54

Net Depreciation Benefit	Rs Lakh	89.74	92.67	24.16	15.76	8.61	2.54	-2.63	-7.02	-10.75	-13.92	-16.61	-18.90	-20.85	-22.51	-23.91	-25.11	-26.13	-12.50	4.16	3.54
Tax Benefit	Rs Lakh	30.50	31.50	8.21	5.36	2.93	0.86	-0.89	-2.39	-3.65	-4.73	-5.65	-6.43	-7.09	-7.65	-8.13	-8.54	-8.88	-4.25	1.41	1.20
Energy generation	MU	0.96	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93
Per unit benefit	Rs/Unit	3.17	1.63	0.43	0.28	0.15	0.04	-0.05	-0.12	-0.19	-0.25	-0.29	-0.33	-0.37	-0.40	-0.42	-0.44	-0.46	-0.22	0.07	0.06

Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15
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Levelised benefit	0.31	Rs/Unit
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Assumptions: Wind Energy Projects						
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Wind Zone 3	
1	Power Generation	<u>Capacity</u>	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	25%	
			Useful Life	Years	25	
2	Project Cost	<u>Capital Cost/MW</u>	Power Plant Cost	Rs Lacs/MW	603.929	
3	Sources of Fund	<u>Debt: Equity</u>	Tariff Period	Years	13	
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	422.750	
			Total Equity Amount	Rs Lacs	181.179	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	422.75
				Moratorium Period	years	0
				Repayment Period(incl'd Moratorium)	years	12
				Interest Rate	%	12.70%
			<u>Equity Component</u>	Equity amount	Rs Lacs	181.18
				Return on Equity for first 10 years	% p.a	20.00%
Return on Equity 11th year onwards	% p.a	24.00%				
Weighted average of ROE		22.40%				
Discount Rate		10.67%				
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%	
			<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
				Depreciation Rate 13th year onwards	%	1.54%
5	Working Capital	<u>For Fixed Charges</u>	O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			<u>For Variable Charges</u>	Interest On Working Capital	%	13.20%
6	Operation & Maintenance	<u>O & M (FY14-15)</u>		Rs Lacs/MW	10.05	
			<u>Total O & M Expenses Escalation</u>	%	5.72%	
			<u>O & M (FY13-14)</u>	Rs Lacs/MW	9.51	



Determination of Tariff

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		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	38.20
Depreciation	Rs Lakh		35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31
Interest on term loan	Rs Lakh		51.45	46.98	42.50	38.03	33.56	29.08	24.61	20.13	15.66	11.19	6.71	2.24	0.00	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	3.24	3.17	3.10	3.04	2.98	2.92	2.86	2.81	2.75	2.87	2.82	2.25	2.31	2.37	2.44	2.51	2.58	2.66	2.75	2.84	2.93	3.03	3.14	3.25
Return on Equity	Rs Lakh		36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48
Total Fixed Cost	Rs Lakh		136.26	132.29	128.36	124.46	120.60	116.78	113.01	109.28	105.60	101.97	105.81	102.29	74.64	75.82	77.07	78.39	79.78	81.26	82.82	84.47	86.21	88.06	90.01	92.07	94.25
Levallised 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	0.73	0.46	0.49	0.51	0.54	0.57	0.61	0.64	0.68	0.72	0.76	0.80	0.85	0.89	0.95	1.00	1.06	1.12	1.18	1.25	1.32	1.40	1.48	1.56	1.65	1.74
Depreciation	Rs/kWh	1.33	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Int. on term loan	Rs/kWh	1.12	2.35	2.15	1.94	1.74	1.53	1.33	1.12	0.92	0.72	0.51	0.31	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.13	0.15	0.15	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.10	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.13	0.13	0.14	0.14	0.15
RoE	Rs/kWh	1.76	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99
Total COG	Rs/kWh	5.07	6.22	6.04	5.86	5.68	5.51	5.33	5.16	4.99	4.82	4.66	4.83	4.67	3.41	3.46	3.52	3.58	3.64	3.71	3.78	3.86	3.94	4.02	4.11	4.20	4.30
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146	0.132	0.119	0.108	0.097	0.088
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		15%																				
Additional Depreciation		20.00%																				
Income Tax (Normal Rates)		33.990%																				
Capital Cost Rs. Lakh		603.929																				
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	15.94	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	17.39	0.00	0.00
Accelerated Depreciation																						
Opening	%	100.00%	82.50%	61.88%	52.59%	44.70%	38.00%	32.30%	27.45%	23.34%	19.84%	16.86%	14.33%	12.18%	10.35%	8.80%	7.48%	6.36%	5.41%	4.59%	3.91%	
Allowed during the year	%	17.50%	20.63%	9.28%	7.89%	6.71%	5.70%	4.84%	4.12%	3.50%	2.98%	2.53%	2.15%	1.83%	1.55%	1.32%	1.12%	0.95%	0.81%	0.69%	0.59%	
Closing	%	83%	62%	52.59%	44.70%	38.00%	32.30%	27.45%	23.34%	19.84%	16.86%	14.33%	12.18%	10.35%	8.80%	7.48%	6.36%	5.41%	4.59%	3.91%	3.32%	
Accelerated Deprn.	Rs Lakh	105.69	124.56	56.05	47.64	40.50	34.42	29.26	24.87	21.14	17.97	15.27	12.98	11.04	9.38	7.97	6.78	5.76	4.90	4.16	3.54	
Net Depreciation Benefit	Rs Lakh	89.74	92.67	24.16	15.76	8.61	2.54	-2.63	-7.02	-10.75	-13.92	-16.61	-18.90	-20.85	-22.51	-23.91	-25.11	-26.13	-12.50	4.16	3.54	
Tax Benefit	Rs Lakh	30.50	31.50	8.21	5.36	2.93	0.86	-0.89	-2.39	-3.65	-4.73	-5.65	-6.43	-7.09	-7.65	-8.13	-8.54	-8.88	-4.25	1.41	1.20	
Energy generation	MU	1.10	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	
Per unit benefit	Rs/Unit	2.79	1.44	0.38	0.24	0.13	0.04	-0.04	-0.11	-0.17	-0.22	-0.26	-0.29	-0.32	-0.35	-0.37	-0.39	-0.41	-0.19	0.06	0.05	
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	
Levellised benefit	0.28	Rs/Unit																				



Assumptions: Wind Energy Projects						
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Wind Zone 4	
1	Power Generation	<u>Capacity</u>	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	30%	
			Useful Life	Years	25	
2	Project Cost	<u>Capital Cost/MW</u>	Power Plant Cost	Rs Lacs/MW	603.929	
3	Sources of Fund	<u>Debt: Equity</u>	Tariff Period	Years	13	
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	422.750	
			Total Equity Amount	Rs Lacs	181.179	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	422.75
				Moratorium Period	years	0
				Repayment Period(incld Moratorium)	years	12
				Interest Rate	%	12.70%
			<u>Equity Component</u>	Equity amount	Rs Lacs	181.18
				Return on Equity for first 10 years	% p.a	20.00%
Return on Equity 11th year onwards	% p.a	24.00%				
Weighted average of ROE		22.40%				
Discount Rate		10.67%				
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%	
			<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
				Depreciation Rate 13th year onwards	%	1.54%
5	Working Capital	<u>For Fixed Charges</u>	O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			<u>For Variable Charges</u>	Interest On Working Capital	%	13.20%
6	Operation & Maintenance	<u>O & M (FY14-15)</u>		Rs Lacs/MW	10.05	
			<u>Total O & M Expenses Escalation</u>	%	5.72%	
			<u>O & M (FY13-14)</u>	Rs Lacs/MW	9.51	



Determination of Tariff

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		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	38.20	
Depreciation	Rs Lakh		35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31	9.31
Interest on term loan	Rs Lakh		51.45	46.98	42.50	38.03	33.56	29.08	24.61	20.13	15.66	11.19	6.71	2.24	0.00	0.00	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	3.24	3.17	3.10	3.04	2.98	2.92	2.86	2.81	2.75	2.87	2.82	2.25	2.31	2.37	2.44	2.51	2.58	2.66	2.75	2.84	2.93	3.03	3.14	3.25	
Return on Equity	Rs Lakh		36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48
Total Fixed Cost	Rs Lakh		136.26	132.29	128.36	124.46	120.60	116.78	113.01	109.28	105.60	101.97	105.81	102.29	74.64	75.82	77.07	78.39	79.78	81.26	82.82	84.47	86.21	88.06	90.01	92.07	94.25	
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	0.61	0.38	0.40	0.43	0.45	0.48	0.51	0.53	0.56	0.60	0.63	0.67	0.71	0.75	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30	1.38	1.45	
Depreciation	Rs/kWh	1.11	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Int. on term loan	Rs/kWh	0.93	1.96	1.79	1.62	1.45	1.28	1.11	0.94	0.77	0.60	0.43	0.26	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.11	0.13	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.10	0.11	0.11	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.11	0.11	0.12	0.12	0.12	
RoE	Rs/kWh	1.46	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
Total COG	Rs/kWh	4.23	5.18	5.03	4.88	4.74	4.59	4.44	4.30	4.16	4.02	3.88	4.03	3.89	2.84	2.89	2.93	2.98	3.04	3.09	3.15	3.21	3.28	3.35	3.42	3.50	3.59	
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146	0.132	0.119	0.108	0.097	0.088	
Levillised Tariff	4.23	Rs/Unit																										



Determination of Accelerated Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	15%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost Rs. Lakh	603.929

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	15.94	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	17.39	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	82.50%	61.88%	52.59%	44.70%	38.00%	32.30%	27.45%	23.34%	19.84%	16.86%	14.33%	12.18%	10.35%	8.80%	7.48%	6.36%	5.41%	4.59%	3.91%
Allowed during the year	%	17.50%	20.63%	9.28%	7.89%	6.71%	5.70%	4.84%	4.12%	3.50%	2.98%	2.53%	2.15%	1.83%	1.55%	1.32%	1.12%	0.95%	0.81%	0.69%	0.59%
Closing	%	83%	62%	52.59%	44.70%	38.00%	32.30%	27.45%	23.34%	19.84%	16.86%	14.33%	12.18%	10.35%	8.80%	7.48%	6.36%	5.41%	4.59%	3.91%	3.32%
Accelerated Deprn.	Rs Lakh	105.69	124.56	56.05	47.64	40.50	34.42	29.26	24.87	21.14	17.97	15.27	12.98	11.04	9.38	7.97	6.78	5.76	4.90	4.16	3.54

Net Depreciation Benefit	Rs Lakh	89.74	92.67	24.16	15.76	8.61	2.54	-2.63	-7.02	-10.75	-13.92	-16.61	-18.90	-20.85	-22.51	-23.91	-25.11	-26.13	-12.50	4.16	3.54
Tax Benefit	Rs Lakh	30.50	31.50	8.21	5.36	2.93	0.86	-0.89	-2.39	-3.65	-4.73	-5.65	-6.43	-7.09	-7.65	-8.13	-8.54	-8.88	-4.25	1.41	1.20
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
Per unit benefit	Rs/Unit	2.32	1.20	0.31	0.20	0.11	0.03	-0.03	-0.09	-0.14	-0.18	-0.21	-0.24	-0.27	-0.29	-0.31	-0.32	-0.34	-0.16	0.05	0.05
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15
Levelling benefit	0.23	Rs/Unit																			



Assumptions: Wind Energy Projects						
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Wind Zone 5	
1	Power Generation	<u>Capacity</u>	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	32%	
			Useful Life	Years	25	
2	Project Cost	<u>Capital Cost/MW</u>	Power Plant Cost	Rs Lacs/MW	603.929	
3	Sources of Fund	<u>Debt: Equity</u>	Tariff Period	Years	13	
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	422.750	
			Total Equity Amount	Rs Lacs	181.179	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	422.75
				Moratorium Period	years	0
				Repayment Period(incl'd Moratorium)	years	12
				Interest Rate	%	12.70%
			<u>Equity Component</u>	Equity amount	Rs Lacs	181.18
				Return on Equity for first 10 years	% p.a	20.00%
Return on Equity 11th year onwards	% p.a	24.00%				
Weighted average of ROE		22.40%				
Discount Rate		10.67%				
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%	
			<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
				Depreciation Rate 13th year onwards	%	1.54%
5	Working Capital	<u>For Fixed Charges</u>	O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			<u>For Variable Charges</u>	Interest On Working Capital	%	13.20%
6	Operation & Maintenance	<u>O & M (FY14-15)</u>		Rs Lacs/MW	10.05	
			<u>Total O & M Expenses Escalation</u>	%	5.72%	
			<u>O & M (FY13-14)</u>	Rs Lacs/MW	9.51	



Determination of Tariff																											
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross/Net Generation	MU		2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		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	38.20
Depreciation	Rs Lakh		35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21	35.21
Interest on term loan	Rs Lakh		51.45	46.98	42.50	38.03	33.56	29.08	24.61	20.13	15.66	11.19	6.71	2.24	0.00	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	3.24	3.17	3.10	3.04	2.98	2.92	2.86	2.81	2.75	2.87	2.82	2.25	2.31	2.37	2.44	2.51	2.58	2.66	2.75	2.84	2.93	3.03	3.14	3.25
Return on Equity	Rs Lakh		36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	36.24	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48	43.48
Total Fixed Cost	Rs Lakh		136.26	132.29	128.36	124.46	120.60	116.78	113.01	109.28	105.60	101.97	105.81	102.29	74.64	76.82	77.07	78.39	79.78	81.26	82.82	84.47	86.21	88.06	90.01	92.07	94.25
Levallised 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	0.57	0.36	0.38	0.40	0.42	0.45	0.47	0.50	0.53	0.56	0.59	0.63	0.66	0.70	0.74	0.78	0.83	0.87	0.92	0.98	1.03	1.09	1.15	1.22	1.29	1.36
Depreciation	Rs/kWh	1.04	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Int. on term loan	Rs/kWh	0.88	1.84	1.68	1.52	1.36	1.20	1.04	0.88	0.72	0.56	0.40	0.24	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.10	0.12	0.12	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.11	0.11	0.12
RoE	Rs/kWh	1.37	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55
Total COG	Rs/kWh	3.96	4.86	4.72	4.68	4.44	4.30	4.17	4.03	3.90	3.77	3.64	3.77	3.66	2.66	2.70	2.76	2.80	2.86	2.90	2.96	3.01	3.08	3.14	3.21	3.28	3.36
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146	0.132	0.119	0.108	0.097	0.088
Levillised Tariff	3.96	Rs/Unit																									



Determination of Accelerated Depreciation for Wind Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	15%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost Rs. Lakh	603.929

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	15.94	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	31.89	17.39	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	82.50%	61.88%	52.59%	44.70%	38.00%	32.30%	27.45%	23.34%	19.84%	16.86%	14.33%	12.18%	10.35%	8.80%	7.48%	6.36%	5.41%	4.59%	3.91%
Allowed during the year	%	17.50%	20.63%	9.28%	7.89%	6.71%	5.70%	4.84%	4.12%	3.50%	2.98%	2.53%	2.15%	1.83%	1.55%	1.32%	1.12%	0.95%	0.81%	0.69%	0.59%
Closing	%	83%	62%	52.59%	44.70%	38.00%	32.30%	27.45%	23.34%	19.84%	16.86%	14.33%	12.18%	10.35%	8.80%	7.48%	6.36%	5.41%	4.59%	3.91%	3.32%
Accelerated Deprn.	Rs Lakh	105.69	124.56	56.05	47.64	40.50	34.42	29.26	24.87	21.14	17.97	15.27	12.98	11.04	9.38	7.97	6.78	5.76	4.90	4.16	3.54

Net Depreciation Benefit	Rs Lakh	89.74	92.67	24.16	15.76	8.61	2.54	-2.63	-7.02	-10.75	-13.92	-16.61	-18.90	-20.85	-22.51	-23.91	-25.11	-26.13	-26.13	-12.50	4.16	3.54
Tax Benefit	Rs Lakh	30.50	31.50	8.21	5.36	2.93	0.86	-0.89	-2.39	-3.65	-4.73	-5.65	-6.43	-7.09	-7.65	-8.13	-8.54	-8.88	-8.88	-4.25	1.41	1.20
Energy generation	MU	1.40	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Per unit benefit	Rs/Unit	2.18	1.12	0.29	0.19	0.10	0.03	-0.03	-0.09	-0.13	-0.17	-0.20	-0.23	-0.25	-0.27	-0.29	-0.30	-0.32	-0.32	-0.15	0.05	0.04
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	
Levillised benefit	0.22	Rs/Unit																				



Small Hydro: Assumptions Parameters					
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	HP, Uttarakhand, NE States
					Less than 5 MW
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	45%
			Auxiliary Consumption	%	1%
			Useful Life	Years	35
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	808.739
3	Sources of Fund		Tariff Period	Years	35
			<u>Debt: Equity</u>		
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	566.117
			Total Equity Amount	Rs Lacs	242.622
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	566.12
			Moratorium Period	years	0
			Repayment Period(inclod Moratorium)	years	12
			Intrest Rate	%	12.70%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	242.62
Normative ROE (Post-tax)		16%			
Return on Equity for first 10 years	% p.a	20%			
Return on Equity 11th year onwards	% p.a	24.00%			
Weighted average of ROE		22.86%			
Discount Rate		10.67%			
4	Financial Assumptions		Income Tax	%	33.990%
			<u>Depreciation</u>		
			Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13th year onwards	%	0.87%
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
			Intrest On Working Capital	%	13.20%
6	Operation & Maintenance		O&M Expenses (2014-15)	Rs Lacs	27.94
			<u>Total O & M Expenses Escalation</u>	%	5.72%
			O&M Expenses (2013-14)		26.43



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		3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
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		27.94	29.54	31.23	33.02	34.90	36.90	39.01	41.24	43.60	46.10	48.73	51.52	54.47	57.58	60.88	64.36	68.04	71.93	76.05	80.40	85.00	89.86	95.00	100.43	106.18	112.25	118.67	125.46	132.63	140.22	148.24	156.72	165.69	175.16	185.18
Depreciation	Rs Lakh		47.15	47.15	47.15	47.15	47.15	47.15	47.15	47.15	47.15	47.15	47.15	47.15	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05	7.05
Interest on term loan	Rs Lakh		68.90	62.91	56.92	50.93	44.94	38.94	32.95	26.96	20.97	14.98	8.99	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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 C	Rs Lakh		5.21	5.16	5.12	5.08	5.05	5.02	5.00	4.99	4.98	4.98	5.20	5.22	4.41	4.58	4.75	4.94	5.14	5.35	5.57	5.81	6.06	6.32	6.60	6.89	7.20	7.53	7.88	8.24	8.63	9.04	9.47	9.93	10.41	10.92	11.47
Return on Equity	Rs Lakh		48.52	48.52	48.52	48.52	48.52	48.52	48.52	48.52	48.52	48.52	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23	58.23
Total Fixed Cost	Rs Lakh		197.73	193.29	188.94	184.70	180.56	176.54	172.64	168.86	165.22	161.73	168.30	165.11	124.15	127.44	130.91	134.58	138.45	142.56	146.90	151.48	156.33	161.45	166.87	172.60	178.65	185.05	191.82	198.98	206.54	214.53	222.99	231.93	241.37	251.36	261.92
Levillised tariff corresponding to Useful life																																					
Per Unit Cost of Ger	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M expn	Rs/kWh	1.27	0.72	0.76	0.80	0.85	0.89	0.95	1.00	1.06	1.12	1.18	1.25	1.32	1.40	1.48	1.56	1.65	1.74	1.84	1.95	2.06	2.18	2.30	2.43	2.57	2.72	2.88	3.04	3.21	3.40	3.59	3.80	4.02	4.25	4.49	4.75
Depreciation	Rs/kWh	0.93	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Int. on term loan	Rs/kWh	0.80	1.77	1.61	1.46	1.30	1.15	1.00	0.84	0.69	0.54	0.38	0.23	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.11	0.12	0.12	0.13	0.13	0.14	0.14	0.15	0.16	0.16	0.17	0.18	0.18	0.19	0.20	0.21	0.22	0.23	0.24	0.25	0.27	0.28	0.29
RoE	Rs/kWh	1.33	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49
Total COG	Rs/kWh	4.46	5.07	4.95	4.84	4.73	4.63	4.52	4.42	4.33	4.23	4.14	4.31	4.23	3.18	3.27	3.35	3.45	3.55	3.65	3.76	3.88	4.01	4.14	4.28	4.42	4.58	4.74	4.92	5.10	5.29	5.50	5.71	5.94	6.18	6.44	6.71
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146	0.132	0.119	0.108	0.097	0.088	0.079	0.072	0.065	0.059	0.053	0.048	0.043	0.039	0.035	0.032
Levillised Tariff	4.46	Rs/Unit																																			



Determination of Accelerated Depreciation

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	808.7

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	21.35	42.70	42.70	42.70	42.70	42.70	42.70	42.70	42.70	42.70	42.70	42.70	42.70	42.70	42.70	42.70	42.70	23.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	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	404.37	363.93	32.35	6.47	1.29	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	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	383.02	321.23	-10.35	-36.23	-41.41	-42.44	-42.65	-42.69	-42.70	-42.70	-42.70	-42.70	-42.70	-42.70	-42.70	-42.70	-42.70	-23.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	130.19	109.19	-3.52	-12.32	-14.07	-14.43	-14.50	-14.51	-14.51	-14.51	-14.51	-14.51	-14.51	-14.51	-14.51	-14.51	-14.51	-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	0.00
Energy generation	MU	1.95	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	
Per unit benefit	Rs/Unit	6.67	2.80	-0.09	-0.32	-0.36	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.13	0.11	0.10	0.09	0.08	0.08	0.07	0.06	0.06	0.05	0.05	0.04	0.04	0.03

Tax Benefit Levelled 13.56

Electricity Generation (Leve 3.72)

Levelled benefit 0.36 Rs/Unit


Small Hydro: Assumptions Parameters					
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	HP, Uttarakhand, NE States
					5 MW to 25 MW
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Capacity Utilization Factor	%	45%
			Auxiliary Consumption	%	1%
			Useful Life	Years	35
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	735.217
3	Sources of Fund		Tariff Period	Years	13
		<u>Debt: Equity</u>			
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	514.652
			Total Equity Amount	Rs Lacs	220.565
		<u>Debt Component</u>			
			Loan Amount	Rs Lacs	514.65
			Moratorium Period	years	0
			Repayment Period(inclod Moratorium)	years	12
			Intrest Rate	%	12.70%
		<u>Equity Component</u>			
			Equity amount	Rs Lacs	220.57
			Normative ROE (Post-tax)		16%
			Return on Equity for first 10 years	% p.a	20%
			Return on Equity 11th year onwards	% p.a	24.00%
			Weighted average of ROE		22.86%
			Discount Rate		10.67%
4	Financial Assumptions		Income Tax	%	33.990%
		<u>Depreciation</u>			
			Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13th year onwards	%	0.87%
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
		Intrest On Working Capital		%	13.20%
6	Operation & Maintenance				
		O&M Expenses (2014-15)		Rs Lacs	20.12
		<u>Total O & M Expenses Escalation</u>		%	5.72%
		O&M Expenses (2013-14)			19.03



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		
Net Generation	MU		3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90		
Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
O&M Expenses	Rs Lakh		20.12	21.27	22.49	23.77	25.13	26.57	28.09	29.70	31.39	33.19	35.09	37.10	39.22	41.46	43.83	46.34	48.99	51.79	54.76	57.89	61.20	64.70	68.40	72.31	76.45	80.82	85.44	90.33	95.50	100.96	106.74	112.84	119.30	126.12	133.33	
Depreciation	Rs Lakh		42.86	42.86	42.86	42.86	42.86	42.86	42.86	42.86	42.86	42.86	42.86	42.86	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	
Interest on term loan	Rs Lakh		62.64	57.19	51.74	46.30	40.85	35.40	29.96	24.51	19.06	13.62	8.17	2.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Interest on working Capital	Rs Lakh		4.45	4.39	4.33	4.28	4.23	4.19	4.15	4.11	4.08	4.05	4.23	4.22	3.45	3.57	3.70	3.84	3.98	4.13	4.29	4.46	4.64	4.83	5.03	5.24	5.46	5.70	5.95	6.21	6.49	6.79	7.10	7.43	7.78	8.14	8.53	
Return on Equity	Rs Lakh		44.11	44.11	44.11	44.11	44.11	44.11	44.11	44.11	44.11	44.11	44.11	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	52.94	
Total Fixed Cost	Rs Lakh		174.18	169.83	165.54	161.33	157.19	153.14	149.17	145.29	141.51	137.84	134.29	130.84	127.51	124.28	121.14	118.09	115.14	112.28	109.51	106.82	104.21	101.68	99.23	96.86	94.56	92.33	90.16	88.04	85.97	83.94	81.95	79.99	78.06	76.16	74.29	
Levilled tariff corresponding to Useful life																																						
Per Unit Cost of Gen	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
O&M expn	Rs/kWh	0.91	0.52	0.55	0.58	0.61	0.64	0.68	0.72	0.76	0.80	0.85	0.90	0.95	1.00	1.06	1.12	1.19	1.26	1.33	1.40	1.48	1.57	1.66	1.75	1.85	1.96	2.07	2.19	2.31	2.45	2.59	2.74	2.89	3.06	3.23	3.42	
Depreciation	Rs/kWh	0.84	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
Int. on term loan	Rs/kWh	0.73	1.61	1.47	1.33	1.19	1.05	0.91	0.77	0.63	0.49	0.35	0.21	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.11	0.11	0.09	0.09	0.09	0.10	0.10	0.11	0.11	0.11	0.12	0.12	0.13	0.13	0.14	0.15	0.15	0.16	0.17	0.17	0.18	0.19	0.20	0.21	0.22	
RoE	Rs/kWh	1.21	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	
Total COG	Rs/kWh	3.80	4.46	4.35	4.24	4.13	4.03	3.92	3.82	3.72	3.63	3.53	3.67	3.58	2.81	2.87	2.74	2.81	2.88	2.95	3.03	3.12	3.21	3.30	3.40	3.51	3.62	3.74	3.86	3.99	4.13	4.28	4.44	4.60	4.78	4.96	5.16	
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146	0.132	0.119	0.108	0.097	0.088	0.079	0.072	0.065	0.059	0.053	0.048	0.043	0.039	0.035	0.032	
Levilled Tariff	3.80	Rs/Unit																																				



Determination of Accelerated Depreciation

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	735.2

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	19.41	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	38.82	21.17	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	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	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	367.61	330.85	29.41	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	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	348.20	292.03	-9.41	-32.94	-37.64	-38.58	-38.77	-38.81	-38.82	-38.82	-38.82	-38.82	-38.82	-38.82	-38.82	-38.82	-38.82	-21.17	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	0.00	0.00	0.00
Tax Benefit	Rs Lakh	118.35	99.26	-3.20	-11.20	-12.79	-13.11	-13.18	-13.19	-13.19	-13.19	-13.19	-13.19	-13.19	-13.19	-13.19	-13.19	-13.19	-7.20	0.00	0.00	0.00	0.00	0.00	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	1.95	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
Per unit benefit	Rs/Unit	6.07	2.54	-0.08	-0.29	-0.33	-0.34	-0.34	-0.34	-0.34	-0.34	-0.34	-0.34	-0.34	-0.34	-0.34	-0.34	-0.34	-0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.13	0.11	0.10	0.09	0.08	0.08	0.07	0.06	0.06	0.05	0.05	0.04	0.04	0.03

Tax Benefit Levelled 12.32

Electricity Generation (Level) 3.72

Levelled benefit 0.33 Rs/Unit


Small Hydro: Assumptions Parameters					
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Other States
					Less than 5 MW
1	Power Generation	Capacity	Installed Power Generation Capacity Capacity Utilization Factor Auxiliary Consumption Useful Life	MW % % Years	1 30% 1% 35
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	630.186
3	Sources of Fund	<u>Debt: Equity</u>	Tariff Period	Years	35
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	441.130
			Total Equity Amount	Rs Lacs	189.056
		<u>Debt Component</u>	Loan Amount	Rs Lacs	441.13
			Moratorium Period	years	0
			Repayment Period(inclod Moratorium)	years	12
			Intrest Rate	%	12.70%
		<u>Equity Component</u>	Equity amount	Rs Lacs	189.06
			Normative ROE (Post-tax)		16%
			Return on Equity for first 10 years	% p.a	20%
			Return on Equity 11th year onwards	% p.a	24.00%
			Weighted average of ROE		22.86%
			Discount Rate		10.67%
4	Financial Assumptions		Income Tax	%	33.990%
		<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13th year onwards	%	0.87%
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
		Intrest On Working Capital		%	13.20%
6	Operation & Maintenance				
		O&M Expenses (2014-15)		Rs Lacs	22.35
		<u>Total O & M Expenses Escalation</u>		%	5.72%
		O&M Expenses (2013-14)			21.14



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	
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	
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		22.35	23.63	24.98	26.41	27.92	29.52	31.20	32.99	34.88	36.87	38.98	41.21	43.57	46.06	48.69	51.48	54.42	57.54	60.83	64.31	67.98	71.87	75.98	80.33	84.92	89.78	94.92	100.35	106.09	112.16	118.57	125.35	132.52	140.10	148.12
Depreciation	Rs Lakh		36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	36.74	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49	5.49
Interest on term loan	Rs Lakh		53.69	49.02	44.35	39.68	35.01	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
Interest on working C	Rs Lakh		4.09	4.06	4.02	4.00	3.97	3.95	3.94	3.93	3.93	3.93	4.11	4.12	3.50	3.63	3.77	3.92	4.08	4.25	4.43	4.62	4.81	5.02	5.25	5.48	5.73	5.99	6.27	6.56	6.87	7.20	7.55	7.91	8.30	8.71	9.14
Return on Equity	Rs Lakh		37.81	37.81	37.81	37.81	37.81	37.81	37.81	37.81	37.81	37.81	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37	45.37
Total Fixed Cost	Rs Lakh		154.68	151.25	147.91	144.64	141.46	138.37	135.37	132.48	129.69	127.02	124.20	121.78	97.93	100.55	103.33	106.27	109.37	112.65	116.12	119.79	123.66	127.76	132.09	136.68	141.52	146.64	152.05	157.77	163.82	170.22	176.98	184.13	191.69	199.68	208.12
Levelling tariff corresponding to Useful life																																					
Per Unit Cost of Ger	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M expn	Rs/kWh	1.52	0.86	0.91	0.96	1.02	1.07	1.13	1.20	1.27	1.34	1.42	1.50	1.58	1.67	1.77	1.87	1.98	2.09	2.21	2.34	2.47	2.61	2.76	2.92	3.09	3.26	3.45	3.65	3.86	4.08	4.31	4.56	4.82	5.09	5.39	5.69
Depreciation	Rs/kWh	1.08	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Int. on term loan	Rs/kWh	0.93	2.06	1.88	1.70	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
Int. on working capital	Rs/kWh	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.13	0.14	0.15	0.15	0.16	0.16	0.17	0.18	0.19	0.19	0.20	0.21	0.22	0.23	0.24	0.25	0.26	0.28	0.29	0.30	0.32	0.33	0.35
RoE	Rs/kWh	1.65	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74
Total COG	Rs/kWh	5.25	5.95	5.81	5.68	5.56	5.44	5.32	5.20	5.09	4.98	4.88	4.80	4.99	3.76	3.86	3.97	4.08	4.20	4.33	4.46	4.60	4.75	4.91	5.08	5.25	5.44	5.64	5.84	6.06	6.30	6.54	6.80	7.08	7.37	7.67	8.00
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146	0.132	0.119	0.108	0.097	0.088	0.079	0.072	0.065	0.059	0.053	0.048	0.043	0.039	0.035	0.032
Levelling Tariff	5.25	Rs/Unit																																			



Determination of Accelerated Depreciation

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	630.2

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	16.64	33.27	33.27	33.27	33.27	33.27	33.27	33.27	33.27	33.27	33.27	33.27	33.27	33.27	33.27	33.27	33.27	18.15	0.00	0.00	0.00	0.00	0.00	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	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	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	315.09	283.58	25.21	5.04	1.01	0.20	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	298.46	250.31	-8.07	-28.23	-32.27	-33.07	-33.23	-33.27	-33.27	-33.27	-33.27	-33.27	-33.27	-33.27	-33.27	-33.27	-33.27	-18.15	0.00	0.00	0.00	0.00	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	101.45	85.08	-2.74	-9.60	-10.97	-11.24	-11.30	-11.31	-11.31	-11.31	-11.31	-11.31	-11.31	-11.31	-11.31	-11.31	-11.31	-6.17	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	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	
Per unit benefit	Rs/Unit	7.80	3.27	-0.11	-0.37	-0.42	-0.43	-0.43	-0.43	-0.43	-0.43	-0.43	-0.43	-0.43	-0.43	-0.43	-0.43	-0.43	-0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.13	0.11	0.10	0.09	0.08	0.08	0.07	0.06	0.06	0.05	0.05	0.04	0.04

Tax Benefit Levellised	10.56
Electricity Generation (Levelled)	2.48
Levelled benefit	0.43 Rs/Unit



Small Hydro: Assumptions Parameters					
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Other States
					5 MW 25 M
1	Power Generation	Capacity	Installed Power Generation Capacity Capacity Utilization Factor Auxiliary Consumption Useful Life	MW % % Years	1 30% 1% 35
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	577.671
3	Sources of Fund	<u>Debt: Equity</u>	Tariff Period	Years	13
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	404.370
			Total Equity Amount	Rs Lacs	173.301
		<u>Debt Component</u>	Loan Amount	Rs Lacs	404.37
			Moratorium Period	years	0
			Repayment Period(inclod Moratorium)	years	12
			Intrest Rate	%	12.70%
		<u>Equity Component</u>	Equity amount	Rs Lacs	173.30
			Normative ROE (Post-tax)		16%
			Return on Equity for first 10 years	% p.a	20%
			Return on Equity 11th year onwards	% p.a	24.00%
			Weighted average of ROE		22.86%
			Discount Rate		10.67%
4	Financial Assumptions		Income Tax	%	33.990%
		<u>Depreciation</u>	Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13th year onwards	%	0.87%
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
		Intrest On Working Capital		%	13.20%
6	Operation & Maintenance				
		O&M Expenses (2014-15)		Rs Lacs	15.65
		<u>Total O & M Expenses Escalation</u>		%	5.72%
		O&M Expenses (2013-14)			14.80



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	
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	
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M Expenses	Rs Lakh		15.65	16.54	17.49	18.49	19.55	20.66	21.85	23.10	24.42	25.81	27.29	28.85	30.50	32.24	34.09	36.04	38.10	40.28	42.58	45.02	47.60	50.32	53.20	56.24	59.46	62.86	66.45	70.25	74.27	78.52	83.01	87.76	92.79	98.09	103.70
Depreciation	Rs Lakh		33.68	33.68	33.68	33.68	33.68	33.68	33.68	33.68	33.68	33.68	33.68	33.68	33.68	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03	5.03
Interest on term loan	Rs Lakh		49.22	44.94	40.66	36.38	32.10	27.82	23.54	19.26	14.98	10.70	6.42	2.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working C	Rs Lakh		3.49	3.44	3.40	3.35	3.31	3.28	3.25	3.22	3.19	3.17	3.31	3.30	2.70	2.79	2.89	2.99	3.11	3.22	3.35	3.48	3.62	3.77	3.92	4.09	4.26	4.44	4.64	4.84	5.06	5.29	5.53	5.79	6.06	6.34	6.65
Return on Equity	Rs Lakh		34.66	34.66	34.66	34.66	34.66	34.66	34.66	34.66	34.66	34.66	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59	41.59
Total Fixed Cost	Rs Lakh		136.69	133.26	129.88	126.56	123.30	120.10	116.97	113.91	110.93	108.02	112.29	109.56	79.82	81.66	83.60	85.66	87.83	90.13	92.66	95.12	97.84	100.71	103.74	106.95	110.34	113.92	117.71	121.72	125.96	130.43	135.17	140.17	145.46	151.06	156.97
Levilled tariff corresponding to Useful life																																					
Per Unit Cost of Ger	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M expn	Rs/kWh	1.07	0.60	0.64	0.67	0.71	0.75	0.79	0.84	0.89	0.94	0.99	1.05	1.11	1.17	1.24	1.31	1.39	1.46	1.55	1.64	1.73	1.83	1.93	2.04	2.16	2.29	2.42	2.55	2.70	2.85	3.02	3.19	3.37	3.57	3.77	3.99
Depreciation	Rs/kWh	0.99	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Int. on term loan	Rs/kWh	0.86	1.89	1.73	1.56	1.40	1.23	1.07	0.90	0.74	0.58	0.41	0.25	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.13	0.13	0.10	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.15	0.16	0.16	0.17	0.18	0.19	0.19	0.20	0.21	0.22	0.23	0.24	0.26
RoE	Rs/kWh	1.42	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Total COG	Rs/kWh	4.47	5.25	5.12	4.99	4.86	4.74	4.62	4.50	4.38	4.26	4.15	4.32	4.21	3.07	3.14	3.21	3.29	3.38	3.46	3.56	3.66	3.76	3.87	3.99	4.11	4.24	4.38	4.52	4.68	4.84	5.01	5.20	5.39	5.59	5.81	6.03
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146	0.132	0.119	0.108	0.097	0.088	0.079	0.072	0.065	0.059	0.053	0.048	0.043	0.039	0.035	0.032
Levilled Tariff	4.47	Rs/Unit																																			



Determination of Accelerated Depreciation

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	577.7

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%	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%
Book Depreciation	Rs Lakh	15.25	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	30.50	16.64	0.00	0.00	0.00	0.00	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	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	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	288.84	259.95	23.11	4.62	0.92	0.18	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	273.58	229.45	-7.39	-25.88	-29.58	-30.32	-30.46	-30.49	-30.50	-30.50	-30.50	-30.50	-30.50	-30.50	-30.50	-30.50	-30.50	-30.50	-16.64	0.00	0.00	0.00	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	92.99	77.99	-2.51	-8.80	-10.05	-10.30	-10.35	-10.36	-10.37	-10.37	-10.37	-10.37	-10.37	-10.37	-10.37	-10.37	-10.37	-10.37	-5.65	0.00	0.00	0.00	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
Per unit benefit	Rs/Unit	7.15	3.00	-0.10	-0.34	-0.39	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.13	0.11	0.10	0.09	0.08	0.08	0.07	0.06	0.06	0.05	0.05	0.04	0.04

Tax Benefit Levelised	9.68
Electricity Generation (Leve	2.48
Levelised benefit	0.39 Rs/Unit



Assumption for Biomass Power Project Parameters			Select State	AP		
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Cap	MW	1	
			Auxillary Consumption during stabl	%	11%	
			Auxillary Consumption after stabl	%	10%	
			PLF(Stablization for 6 months)	%	60%	
			PLF(during first year after Stabl	%	70%	
			PLF(second year onwards)	%	80%	
			Useful Life	Years	20	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/M	544.187	
		3	Financial Assumptions	Debt: Equity	Debt	%
Equity	%				30%	
Total Debt Amount	Rs Lacs				380.931	
Debt Component	Total Equity Amout			Rs Lacs	163.256	
	Loan Amount			Rs Lacs	380.931	
	Moratorium Period			years	0	
	Repayment Period(incl Morator			years	12	
Equity Component	Interest Rate			%	12.70%	
	Equity amount			Rs Lacs	163.256	
	Return on Equity for first 10 year			% p.a	20.00%	
	Return on Equity after 10 years			%	24.00%	
	Weighted average of ROE			%	22.00%	
	Discount Rate (equiv. to WACC)			%	10.67%	
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%	
			Depreciation	Depreciation Rate(power plant)	%	5.830%
				Depreciation Rate 13th year onw	%	2.505%
5	Working Capital	For Fixed Charges	O&M Charges	Months	1	
			Maintenance Spare (% of O&M exepenses)		15%	
			Receivables for Debtors	Months	2	
			For Variable Charges	Biomass Stock	Months	4
				Interest On Working Capital	%	13.20%
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	4200	
			During Stablization Period	Kcal/kwh	4200	
		Biomass	Base Price	Rs/T	2751.20	
			GCV - Biomass	Kcal/kg	3100	
			Biomass Price Escalation Factor		5.00%	
7	Operation & Maintenance	O&M Expenses (2014-15)	O & M Expenses Escalation	%	5.72%	
			O&M Expenses (2013-14)	Rs Lacs	40.00	



Determination of Tariff Component: Biomass Power Projects

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		5.69	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
Auxiliary Consumption	MU		0.63	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Net Generation	MU		5.07	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31

Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		212.24	274.28	287.99	302.39	317.51	333.39	350.06	367.56	385.94	405.24	425.50	446.77	469.11	492.57	517.19	543.05	570.21	598.72	628.65	660.09

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		42.29	44.71	47.26	49.97	52.83	55.85	59.04	62.42	65.99	69.76	73.75	77.97	82.43	87.15	92.13	97.40	102.97	108.87	115.09	121.68
Depreciation	Rs Lakh		31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	13.63	13.63	13.63	13.63	13.63	13.63	13.63	13.63
Interest on term loan	Rs Lakh		46.36	42.33	38.30	34.27	30.24	26.20	22.17	18.14	14.11	10.08	6.05	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		19.10	23.32	24.30	25.32	26.41	27.55	28.76	30.03	31.37	32.79	34.43	36.00	37.30	39.13	41.06	43.09	45.23	47.47	49.83	52.30
Return on Equity	Rs Lakh		32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18
Total Fixed Cost	Rs Lakh		172.12	174.74	174.24	173.94	173.85	173.98	174.35	174.97	175.85	177.01	185.14	186.90	172.54	179.10	186.01	193.31	201.02	209.15	217.73	226.79

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
Variable COG	Rs/kWh	5.85	4.19	4.35	4.57	4.79	5.03	5.29	5.55	5.83	6.12	6.42	6.75	7.08	7.44	7.81	8.20	8.61	9.04	9.49	9.97	10.47
O&M expn	Rs/kWh	1.02	0.83	0.71	0.75	0.79	0.84	0.89	0.94	0.99	1.05	1.11	1.17	1.24	1.31	1.38	1.46	1.54	1.63	1.73	1.82	1.93
Depreciation	Rs/kWh	0.46	0.63	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Int. on term loan	Rs/kWh	0.39	0.91	0.67	0.61	0.54	0.48	0.42	0.35	0.29	0.22	0.16	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.48	0.38	0.37	0.39	0.40	0.42	0.44	0.46	0.48	0.50	0.52	0.55	0.57	0.59	0.62	0.65	0.68	0.72	0.75	0.79	0.83
RoE	Rs/kWh	0.56	0.64	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Total COG	Rs/kWh	8.76	7.58	7.12	7.33	7.55	7.79	8.04	8.31	8.60	8.91	9.23	9.68	10.05	10.17	10.65	11.15	11.68	12.23	12.81	13.42	14.06

Levillised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146

Variable Cost (FY2014-15)	4.19	Rs/kwh
Levillised Tariff (Fixed)	2.91	Rs/kwh
Applicable Tariff (FY2014-15)	7.10	Rs/kwh



Determination of Accelerated Depreciation for Biomass Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional depreciation	20.00%
Income Tax (Normal Rates)	33.99%
Capital Cost	544.187

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	14.37	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	15.67	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	272.09	244.88	21.77	4.35	0.87	0.17	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	257.73	216.15	-6.97	-24.38	-27.86	-28.56	-28.70	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-15.67	0.00	0.00
Tax Benefit	Rs Lakh	87.60	73.47	-2.37	-8.29	-9.47	-9.71	-9.75	-9.76	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-5.33	0.00	0.00
Net Energy generation	MU	2.53	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	3.46	1.16	-0.04	-0.13	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.08	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.13

Levellised benefit **0.17** (Rs/kWh)



Assumption for Biomass Power Project Parameters			Select State	Harayana		
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capa	MW	1	
			Auxillary Consumption during sta	%	11%	
			Auxillary Consumption after stab	%	10%	
			PLF(Stablization for 6 months)	%	60%	
			PLF(during first year after Stabliz	%	70%	
			PLF(second year onwards)	%	80%	
			Useful Life	Years	20	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/M	544.187	
3	Financial Assumptions	Debt: Equity	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	380.931	
			Total Equity Amount	Rs Lacs	163.256	
			Debt Component	Loan Amount	Rs Lacs	380.931
				Moratorium Period	years	0
				Repayment Period(incld Morator	years	12
				Interest Rate	%	12.70%
			Equity Component	Equity amount	Rs Lacs	163.256
				Return on Equity for first 10 year	% p.a	20.00%
Return on Equity after 10 years	%	24.00%				
Weighted average of ROE	%	22.00%				
			Discount Rate (equiv. to WACC)	%	10.67%	
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%	
			Depreciation	Depreciation Rate(power plant)	%	5.830%
				Depreciation Rate 13th year onw	%	2.505%
5	Working Capital	For Fixed Charges	O&M Charges	Months	1	
			Maintenance Spare (% of O&M exepenses)		15%	
			Receivables for Debtors	Months	2	
			For Variable Charges	Biomass Stock	Months	4
				Interest On Working Capital	%	13.20%
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	4200	
			During Stablization Period	Kcal/kwh	4200	
		Biomass	Base Price	Rs/T	3131.50	
			GCV - Biomass	Kcal/kg	3100	
			Biomass Price Escalation Factor		5.00%	
7	Operation & Maintenance	O&M Expenses (2014-15)		Rs Lacs	42.29	
			O & M Expenses Escalation	%	5.72%	
			O&M Expenses (2013-14)	Rs Lacs	40.00	



Determination of Tariff Component: Biomass Power Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		5.69	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
Auxiliary Consumption	MU		0.63	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Net Generation	MU		5.07	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		241.58	312.19	327.80	344.19	361.40	379.47	398.45	418.37	439.29	461.25	484.31	508.53	533.96	560.65	588.69	618.12	649.03	681.48	715.55	751.33
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		42.29	44.71	47.26	49.97	52.83	55.85	59.04	62.42	65.99	69.76	73.75	77.97	82.43	87.15	92.13	97.40	102.97	108.87	115.09	121.68
Depreciation	Rs Lakh		31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	13.63	13.63	13.63	13.63	13.63	13.63	13.63	13.63
Interest on term loan	Rs Lakh		46.36	42.33	38.30	34.27	30.24	26.20	22.17	18.14	14.11	10.08	6.05	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		21.08	25.88	26.98	28.14	29.37	30.66	32.02	33.46	34.97	36.57	38.40	40.17	41.67	43.73	45.89	48.16	50.55	53.05	55.69	58.46
Return on Equity	Rs Lakh		32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18
Total Fixed Cost	Rs Lakh		174.10	177.30	176.92	176.76	176.81	177.09	177.62	178.40	179.45	180.79	189.11	191.06	176.92	183.69	190.84	198.38	206.34	214.73	223.60	232.95
Levallised tariff corresponding to Useful life																						
Per Unit Cost of Generation	Unit	Levallised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	6.65	4.77	4.95	5.20	5.46	5.73	6.02	6.32	6.63	6.96	7.31	7.68	8.06	8.47	8.89	9.33	9.80	10.29	10.80	11.35	11.91
O&M expn	Rs/kWh	1.02	0.83	0.71	0.75	0.79	0.84	0.89	0.94	0.99	1.05	1.11	1.17	1.24	1.31	1.38	1.46	1.54	1.63	1.73	1.82	1.93
Depreciation	Rs/kWh	0.46	0.63	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Int. on term loan	Rs/kWh	0.39	0.91	0.67	0.61	0.54	0.48	0.42	0.35	0.29	0.22	0.16	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.54	0.42	0.41	0.43	0.45	0.47	0.49	0.51	0.53	0.55	0.58	0.61	0.64	0.66	0.69	0.73	0.76	0.80	0.84	0.88	0.93
RoE	Rs/kWh	0.56	0.64	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Total COG	Rs/kWh	9.62	8.20	7.76	8.00	8.26	8.53	8.82	9.13	9.46	9.81	10.18	10.68	11.09	11.27	11.80	12.36	12.95	13.58	14.21	14.89	15.61
Levallised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146
Variable Cost (FY2014-15)	4.77	Rs/kWh																				
Levallised Tariff (Fixed)	2.97	Rs/kWh																				
Applicable Tariff (FY2014-15)	7.73	Rs/kWh																				



Determination of Accelerated Depreciation for Biomass Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional depreciation	20.00%
Income Tax (Normal Rates)	33.99%
Capital Cost	544.187

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	14.37	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	15.67	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	272.09	244.88	21.77	4.35	0.87	0.17	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	257.73	216.15	-6.97	-24.38	-27.86	-28.56	-28.70	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-15.67	0.00	0.00
Tax Benefit	Rs Lakh	87.60	73.47	-2.37	-8.29	-9.47	-9.71	-9.75	-9.76	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-5.33	0.00	0.00
Net Energy generation	MU	2.53	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	3.46	1.16	-0.04	-0.13	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.08	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15

Levellised benefit **0.17** **(Rs/kWh)**



Assumption for Biomass Power Project Parameters			Select State	Maharashtra	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	Power Generation	Capacity	Installed Power Generation Cap	MW	1
			Auxillary Consumption during sta	%	11%
			Auxillary Consumption after stab	%	10%
			PLF(Stablization for 6 months)	%	60%
			PLF(during first year after Stabliz	%	70%
			PLF(second year onwards)	%	80%
			Useful Life	Years	20
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/M	544.187
3	Financial Assumptions	Debt: Equity	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	380.931
			Total Equity Amount	Rs Lacs	163.256
		Debt Component	Loan Amount	Rs Lacs	380.931
			Moratorium Period	years	0
			Repayment Period(inclcd Morator	years	12
			Interest Rate	%	12.70%
		Equity Component	Equity amount	Rs Lacs	163.256
			Return on Equity for first 10 year	% p.a	20.00%
Return on Equity after 10 years	%		24.00%		
Weighted average of ROE	%		22.00%		
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%
			Depreciation	Depreciation Rate(power plant)	%
				Depreciation Rate 13th year onw	%
5	Working Capital	For Fixed Charges	O&M Charges	Months	1
			Maintenance Spare (% of O&M exepenses)		15%
		For Variable Charges	Receivables for Debtors	Months	2
			Biomass Stock	Months	4
			Interest On Working Capital	%	13.20%
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	4200
			During Stablization Period	Kcal/kwh	4200
		Biomass	Base Price	Rs/T	3202.80
			GCV - Biomass	Kcal/kg	3100
			Biomass Price Escalation Factor		5.00%
7	Operation & Maintenance	O&M Expenses (2014-15)	O & M Expenses Escalation	Rs Lacs	42.29
			O&M Expenses (2013-14)	%	5.72%
				Rs Lacs	40.00



Determination of Tariff Component: Biomass Power Projects																							
Units Generation		Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU			5.69	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
Auxiliary Consumption	MU			0.63	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Net Generation	MU			5.07	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Variable Cost		Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh			247.08	319.30	335.27	352.03	369.63	388.11	407.52	427.89	449.29	471.75	495.34	520.11	546.11	573.42	602.09	632.19	663.80	696.99	731.84	768.44
Fixed Cost		Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh			42.29	44.71	47.26	49.97	52.83	55.85	59.04	62.42	65.99	69.76	73.75	77.97	82.43	87.15	92.13	97.40	102.97	108.87	115.09	121.68
Depreciation	Rs Lakh			31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73
Interest on term loan	Rs Lakh			46.36	42.33	38.30	34.27	30.24	26.20	22.17	18.14	14.11	10.08	6.05	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh			21.45	26.36	27.49	28.67	29.92	31.24	32.64	34.10	35.65	37.28	39.14	40.95	42.49	44.59	46.79	49.11	51.54	54.10	56.79	59.61
Return on Equity	Rs Lakh			32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18
Total Fixed Cost	Rs Lakh			174.48	177.78	177.43	177.29	177.36	177.67	178.23	179.04	180.13	181.50	189.85	191.85	177.74	184.55	191.74	199.33	207.33	215.78	224.70	234.10
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
Variable COG	Rs/kWh	6.81		4.88	5.06	5.32	5.58	5.86	6.15	6.46	6.78	7.12	7.48	7.85	8.25	8.66	9.09	9.55	10.02	10.52	11.05	11.60	12.18
O&M expn	Rs/kWh	1.02		0.83	0.71	0.75	0.79	0.84	0.89	0.94	0.99	1.05	1.11	1.17	1.24	1.31	1.38	1.46	1.54	1.63	1.73	1.82	1.93
Depreciation	Rs/kWh	0.46		0.63	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Int. on term loan	Rs/kWh	0.39		0.91	0.67	0.61	0.54	0.48	0.42	0.35	0.29	0.22	0.16	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.55		0.42	0.42	0.44	0.45	0.47	0.50	0.52	0.54	0.57	0.59	0.62	0.65	0.67	0.71	0.74	0.78	0.82	0.86	0.90	0.95
RoE	Rs/kWh	0.56		0.64	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Total COG	Rs/kWh	9.78		8.32	7.88	8.13	8.39	8.67	8.97	9.29	9.62	9.98	10.36	10.86	11.29	11.48	12.02	12.59	13.18	13.81	14.47	15.17	15.90
Levillised Tariff		Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor				1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146
Variable Cost (FY2014-15)	4.88	Rs/Kwh																					
Levillised Tariff (Fixed)	2.98	Rs/Kwh																					
Applicable Tariff (FY2014-15)	7.85	Rs/Kwh																					



Determination of Accelerated Depreciation for Biomass Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional depreciation	20.00%
Income Tax (Normal Rates)	33.99%
Capital Cost	544.187

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	14.37	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	15.67	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	272.09	244.88	21.77	4.35	0.87	0.17	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	257.73	216.15	-6.97	-24.38	-27.86	-28.56	-28.70	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-15.67	0.00	0.00
Tax Benefit	Rs Lakh	87.60	73.47	-2.37	-8.29	-9.47	-9.71	-9.75	-9.76	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-5.33	0.00	0.00
Net Energy generation	MU	2.53	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	3.46	1.16	-0.04	-0.13	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.08	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15

Levillised benefit 0.17 (Rs/kWh)



Assumption for Biomass Power Project Parameters			Select State	Punjab	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	Power Generation	Capacity	Installed Power Generation Cap.	MW	1
			Auxillary Consumption during start up	%	11%
			Auxillary Consumption after start up	%	10%
			PLF(Stablization for 6 months)	%	60%
			PLF(during first year after Stablization)	%	70%
			PLF(second year onwards)	%	80%
			Useful Life	Years	20
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	544.187
3	Financial Assumptions	Debt: Equity	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	380.931
			Total Equity Amount	Rs Lacs	163.256
		Debt Component	Loan Amount	Rs Lacs	380.931
			Moratorium Period	years	0
			Repayment Period(incl'd Moratorium)	years	12
			Interest Rate	%	12.70%
		Equity Component	Equity amount	Rs Lacs	163.256
			Return on Equity for first 10 year	% p.a	20.00%
			Return on Equity after 10 years	%	24.00%
	Weighted average of ROE	%	22.00%		
	Discount Rate (equiv. to WACC)	%	10.67%		
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%
			Depreciation		
			Depreciation Rate(power plant)	%	5.830%
	Depreciation Rate 13th year onwards	%	2.505%		
5	Working Capital	For Fixed Charges	O&M Charges	Months	1
			Maintenance Spare (% of O&M exepenses)		15%
		Receivables for Debtors	Months	2	
		For Variable Charges			
		Biomass Stock	Months	4	
	Interest On Working Capital	%	13.20%		
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	4200
			During Stablization Period	Kcal/kwh	4200
		Biomass	Base Price	Rs/T	3275.29
			GCV - Biomass	Kcal/kg	3100
			Biomass Price Escalation Factor		5.00%
7	Operation & Maintenance	O&M Expenses (2014-15)	Rs Lacs	42.29	
		O & M Expenses Escalation	%	5.72%	
		O&M Expenses (2013-14)	Rs Lacs	40.00	



Determination of Tariff Component: Biomass Power Projects

Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		5.69	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
Auxiliary Consumption	MU		0.63	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Net Generation	MU		5.07	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31

Variable Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		252.67	326.53	342.85	360.00	378.00	396.90	416.74	437.58	459.46	482.43	506.55	531.88	558.47	586.40	615.72	646.50	678.83	712.77	748.41	785.83

Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		42.29	44.71	47.26	49.97	52.83	55.85	59.04	62.42	65.99	69.76	73.75	77.97	82.43	87.15	92.13	97.40	102.97	108.87	115.09	121.68
Depreciation	Rs Lakh		31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.63	31.63	31.63	31.63	31.63	31.63	31.63
Interest on term loan	Rs Lakh		46.36	42.33	38.30	34.27	30.24	26.20	22.17	18.14	14.11	10.08	6.05	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		21.83	26.85	28.00	29.21	30.49	31.84	33.26	34.76	36.33	38.00	39.90	41.74	43.33	45.47	47.71	50.08	52.56	55.17	57.91	60.79
Return on Equity	Rs Lakh		32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18
Total Fixed Cost	Rs Lakh		174.85	178.26	177.94	177.82	177.93	178.27	178.85	179.69	180.81	182.22	190.61	192.64	178.57	185.43	192.66	200.29	208.35	216.84	225.81	235.28

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
Variable COG	Rs/kWh	6.96	4.99	5.18	5.44	5.71	5.99	6.29	6.61	6.94	7.28	7.65	8.03	8.43	8.85	9.30	9.76	10.25	10.76	11.30	11.87	12.46
O&M expn	Rs/kWh	1.02	0.83	0.71	0.75	0.79	0.84	0.89	0.94	0.99	1.05	1.11	1.17	1.24	1.31	1.38	1.46	1.54	1.63	1.73	1.82	1.93
Depreciation	Rs/kWh	0.46	0.63	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Int. on term loan	Rs/kWh	0.39	0.91	0.67	0.61	0.54	0.48	0.42	0.35	0.29	0.22	0.16	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.56	0.43	0.43	0.44	0.46	0.48	0.50	0.53	0.55	0.58	0.60	0.63	0.66	0.69	0.72	0.76	0.79	0.83	0.87	0.92	0.96
RoE	Rs/kWh	0.56	0.64	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Total COG	Rs/kWh	9.95	8.44	8.00	8.26	8.53	8.81	9.12	9.44	9.79	10.15	10.54	11.05	11.49	11.69	12.24	12.82	13.43	14.07	14.74	15.45	16.19

Levillised Tariff	Unit	Year →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146

Variable Cost (FY2014-15)	4.99/Rs/Kwh
Levillised Tariff (Fixed)	2.99/Rs/Kwh
Applicable Tariff (FY2014-15)	7.97/Rs/Kwh



Determination of Accelerated Depreciation for Biomass Power Project																						
Depreciation amount	90%																					
Book Depreciation rate	5.28%																					
Tax Depreciation rate	80%																					
Additional depreciation	20.00%																					
Income Tax (Normal Rates)	33.99%																					
Capital Cost	544.187																					
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	14.37	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	15.67	0.00	0.00
Accelerated Depreciation																						
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	272.09	244.88	21.77	4.35	0.87	0.17	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	257.73	216.15	-6.97	-24.38	-27.86	-28.56	-28.70	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-15.67	0.00	0.00
Tax Benefit	Rs Lakh	87.60	73.47	-2.37	-8.29	-9.47	-9.71	-9.75	-9.76	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-5.33	0.00	0.00
Net Energy generation	MU	2.53	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	3.46	1.16	-0.04	-0.13	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.08	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.15
Levelling benefit	0.17 (Rs/kWh)																					



		Select State	Rajasthan			
Assumption for Biomass Power Project Parameters						
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Cap.	MW	1	
			Auxillary Consumption during sta	%	11%	
			Auxillary Consumption after stab	%	10%	
			PLF(Stablization for 6 months)	%	60%	
			PLF(during first year after Stabliz	%	70%	
			PLF(second year onwards)	%	80%	
			Useful Life	Years	20	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/M	544.187	
3	Financial Assumptions	Debt: Equity	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	380.931	
			Total Equity Amout	Rs Lacs	163.256	
			Debt Component	Loan Amount	Rs Lacs	380.931
				Moratorium Period	years	0
				Repayment Period(incl'd Morator	years	12
			Equity Component	Interest Rate	%	12.70%
				Equity amount	Rs Lacs	163.256
				Return on Equity for first 10 year	% p.a	20.00%
Return on Equity after 10 years	%	24.00%				
Weighted average of ROE	%	22.00%				
Discount Rate (equiv. to WACC)	%	10.67%				
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%	
			Depreciation	Depreciation Rate(power plant)	%	5.830%
				Depreciation Rate 13th year onw	%	2.505%
5	Working Capital	For Fixed Charges	O&M Charges	Months	1	
			Maintenance Spare (% of O&M exepenses)		15%	
			Receivables for Debtors	Months	2	
			For Variable Charges	Biomass Stock	Months	4
				Interest On Working Capital	%	13.20%
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	4200	
			During Stablization Period	Kcal/kwh	4200	
			Biomass	Base Price	Rs/T	2733.37
				GCV - Biomass	Kcal/kg	3100
				Biomass Price Escalation Factor		5.00%
7	Operation & Maintenance	O&M Expenses (2014-15)	O & M Expenses Escalation	%	5.72%	
			O&M Expenses (2013-14)	Rs Lacs	40.00	
				Rs Lacs	42.29	



Determination of Tariff Component: Biomass Power Projects

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		5.69	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
Auxiliary Consumption	MU		0.63	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Net Generation	MU		5.07	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31

Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		210.86	272.50	286.13	300.43	315.45	331.23	347.79	365.18	383.44	402.61	422.74	443.88	466.07	489.37	513.84	539.53	566.51	594.84	624.58	655.81

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		42.29	44.71	47.26	49.97	52.83	55.85	59.04	62.42	65.99	69.76	73.75	77.97	82.43	87.15	92.13	97.40	102.97	108.87	115.09	121.68
Depreciation	Rs Lakh		31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	13.63	13.63	13.63	13.63	13.63	13.63	13.63	13.63
Interest on term loan	Rs Lakh		46.36	42.33	38.30	34.27	30.24	26.20	22.17	18.14	14.11	10.08	6.05	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		19.00	23.20	24.17	25.19	26.27	27.41	28.60	29.87	31.20	32.61	34.24	35.80	37.09	38.92	40.84	42.86	44.98	47.21	49.55	52.01
Return on Equity	Rs Lakh		32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18
Total Fixed Cost	Rs Lakh		172.03	174.62	174.11	173.80	173.71	173.84	174.20	174.81	175.68	176.83	184.95	186.70	172.34	178.88	185.79	193.07	200.77	208.89	217.46	226.50

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
Variable COG	Rs/kWh	5.81	4.16	4.32	4.54	4.76	5.00	5.25	5.51	5.79	6.08	6.38	6.70	7.04	7.39	7.76	8.15	8.55	8.98	9.43	9.90	10.40
O&M expn	Rs/kWh	1.02	0.83	0.71	0.75	0.79	0.84	0.89	0.94	0.99	1.05	1.11	1.17	1.24	1.31	1.38	1.46	1.54	1.63	1.73	1.82	1.93
Depreciation	Rs/kWh	0.46	0.63	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Int. on term loan	Rs/kWh	0.39	0.91	0.67	0.61	0.54	0.48	0.42	0.35	0.29	0.22	0.16	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.48	0.38	0.37	0.38	0.40	0.42	0.43	0.45	0.47	0.49	0.52	0.54	0.57	0.59	0.62	0.65	0.68	0.71	0.75	0.79	0.82
RoE	Rs/kWh	0.56	0.64	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Total COG	Rs/kWh	8.72	7.56	7.09	7.30	7.52	7.76	8.01	8.28	8.56	8.86	9.19	9.63	10.00	10.12	10.60	11.09	11.62	12.17	12.74	13.35	13.99

Levillised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146

Variable Cost (FY2014-15)	4.16	Rs/Kwh
Levillised Tariff (Fixed)	2.91	Rs/Kwh
Applicable Tariff (FY2014-15)	7.07	Rs/Kwh



Determination of Accelerated Depreciation for Biomass Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional depreciation	20.00%
Income Tax (Normal Rates)	33.99%
Capital Cost	544.187

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	14.37	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	15.67	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	272.09	244.88	21.77	4.35	0.87	0.17	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	257.73	216.15	-6.97	-24.38	-27.86	-28.56	-28.70	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-15.67	0.00	0.00
Tax Benefit	Rs Lakh	87.60	73.47	-2.37	-8.29	-9.47	-9.71	-9.75	-9.76	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-5.33	0.00	0.00
Net Energy generation	MU	2.53	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	3.46	1.16	-0.04	-0.13	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.08	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.15

Levellised benefit 0.17 (Rs/kWh)



Assumption for Biomass Power Project Parameters				Select State	TN	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Cap	MW	1	
			Auxillary Consumption during sta	%	11%	
			Auxillary Consumption after stab	%	10%	
			PLF(Stablization for 6 months)	%	60%	
			PLF(during first year after Stabliz	%	70%	
			PLF(second year onwards)	%	80%	
			Useful Life	Years	20	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/M	544.187	
3	Financial Assumptions	Debt: Equity	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	380.931	
			Total Equity Amout	Rs Lacs	163.256	
			Debt Component	Loan Amount	Rs Lacs	380.931
				Moratorium Period	years	0
				Repayment Period(incl'd Morator	years	12
			Equity Component	Interest Rate	%	12.70%
				Equity amount	Rs Lacs	163.256
				Return on Equity for first 10 year	% p.a	20.00%
				Return on Equity after 10 years	%	24.00%
Weighted average of ROE	%	22.00%				
Discount Rate (equiv. to WACC)	%	10.67%				
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%	
			Depreciation	Depreciation Rate(power plant)	%	5.830%
				Depreciation Rate 13th year onw	%	2.505%
5	Working Capital	For Fixed Charges	O&M Charges	Months	1	
			Maintenance Spare (% of O&M exepenses)		15%	
			Receivables for Debtors	Months	2	
			For Variable Charges	Biomass Stock	Months	4
				Interest On Working Capital	%	13.20%
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	4200	
			During Stablization Period	Kcal/kwh	4200	
		Biomass	Base Price	Rs/T	2706.03	
			GCV - Biomass	Kcal/kg	3100	
			Biomass Price Escalation Factor		5.00%	
7	Operation & Maintenance	O&M Expenses (2014-15)	O & M Expenses Escalation	%	5.72%	
			O&M Expenses (2013-14)	Rs Lacs	40.00	
				Rs Lacs	42.29	



Determination of Tariff Component: Biomass Power Projects																						
Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		5.69	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
Auxiliary Consumption	MU		0.63	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Net Generation	MU		5.07	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Variable Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		208.76	269.78	283.26	297.43	312.30	327.91	344.31	361.53	379.60	398.58	418.51	439.44	461.41	484.48	508.70	534.14	560.85	588.89	618.33	649.25
Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		42.29	44.71	47.26	49.97	52.83	55.85	59.04	62.42	65.99	69.76	73.75	77.97	82.43	87.15	92.13	97.40	102.97	108.87	115.09	121.68
Depreciation	Rs Lakh		31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	13.63	13.63	13.63	13.63	13.63	13.63	13.63	13.63
Interest on term loan	Rs Lakh		46.36	42.33	38.30	34.27	30.24	26.20	22.17	18.14	14.11	10.08	6.05	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		18.86	23.02	23.98	24.99	26.06	27.18	28.37	29.62	30.95	32.34	33.96	35.51	36.78	38.59	40.49	42.49	44.60	46.81	49.13	51.57
Return on Equity	Rs Lakh		32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18
Total Fixed Cost	Rs Lakh		171.89	174.43	173.92	173.60	173.50	173.61	173.96	174.56	175.42	176.56	184.67	186.40	172.02	178.55	185.44	192.71	200.38	208.48	217.04	226.06
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
Variable COG	Rs/kWh	5.75	4.12	4.28	4.49	4.72	4.95	5.20	5.46	5.73	6.02	6.32	6.64	6.97	7.32	7.68	8.07	8.47	8.89	9.34	9.80	10.29
O&M expn	Rs/kWh	1.02	0.83	0.71	0.75	0.79	0.84	0.89	0.94	0.99	1.05	1.11	1.17	1.24	1.31	1.38	1.46	1.54	1.63	1.73	1.82	1.93
Depreciation	Rs/kWh	0.46	0.63	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Int. on term loan	Rs/kWh	0.39	0.91	0.67	0.61	0.54	0.48	0.42	0.35	0.29	0.22	0.16	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.47	0.37	0.36	0.38	0.40	0.41	0.43	0.45	0.47	0.49	0.51	0.54	0.56	0.58	0.61	0.64	0.67	0.71	0.74	0.78	0.82
RoE	Rs/kWh	0.56	0.64	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Total COG	Rs/kWh	8.65	7.51	7.04	7.25	7.47	7.70	7.95	8.22	8.50	8.80	9.12	9.56	9.92	10.04	10.51	11.01	11.52	12.07	12.64	13.24	13.88
Levillised Tariff	Unit	Year →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146
Variable Cost (FY2014-15)	4.12	Rs/Kwh																				
Levillised Tariff (Fixed)	2.90	Rs/Kwh																				
Applicable Tariff (FY2014-15)	7.02	Rs/Kwh																				



Determination of Accelerated Depreciation for Biomass Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional depreciation	20.00%
Income Tax (Normal Rates)	33.99%
Capital Cost	544.187

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	14.37	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	15.67	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	272.09	244.88	21.77	4.35	0.87	0.17	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	257.73	216.15	-6.97	-24.38	-27.86	-28.56	-28.70	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-15.67	0.00	0.00	
Tax Benefit	Rs Lakh	87.60	73.47	-2.37	-8.29	-9.47	-9.71	-9.75	-9.76	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-5.33	0.00	0.00
Net Energy generation	MU	2.53	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	3.46	1.16	-0.04	-0.13	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.08	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15		

Levellised benefit	0.17 (Rs/kWh)
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Assumption for Biomass Power Project Parameters				Select State	UP	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Cap	MW	1	
			Auxillary Consumption during sta	%	11%	
			Auxillary Consumption after stab	%	10%	
			PLF(Stablization for 6 months)	%	60%	
			PLF(during first year after Stabliz	%	70%	
			PLF(second year onwards)	%	80%	
			Useful Life	Years	20	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/M	544.187	
3	Financial Assumptions	Debt: Equity	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	380.931	
			Total Equity Amout	Rs Lacs	163.256	
			Debt Component	Loan Amount	Rs Lacs	380.931
				Moratorium Period	years	0
				Repayment Period(inclد Morator	years	12
				Interest Rate	%	12.70%
			Equity Component	Equity amount	Rs Lacs	163.256
				Return on Equity for first 10 year	% p.a	20.00%
Return on Equity after 10 years	%	24.00%				
Weighted average of ROE	%	22.00%				
			Discount Rate (equiv. to WACC)	%	10.67%	
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%	
			Depreciation	Depreciation Rate(power plant)	%	5.830%
				Depreciation Rate 13th year onw	%	2.505%
5	Working Capital	For Fixed Charges	O&M Charges	Months	1	
			Maintenance Spare (% of O&M expenses)		15%	
			Receivables for Debtors	Months	2	
			For Variable Charges	Biomass Stock	Months	4
				Interest On Working Capital	%	13.20%
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	4200	
			During Stablization Period	Kcal/kwh	4200	
		Biomass	Base Price	Rs/T	2798.73	
			GCV - Biomass	Kcal/kg	3100	
			Biomass Price Escalation Factor		5.00%	
7	Operation & Maintenance	O&M Expenses (2014-15)	O & M Expenses Escalation	%	5.72%	
			O&M Expenses (2013-14)	Rs Lacs	40.00	
				Rs Lacs	42.29	



Determination of Tariff Component: Biomass Power Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		5.69	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
Auxiliary Consumption	MU		0.63	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Net Generation	MU		5.07	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		215.91	279.02	292.97	307.62	323.00	339.15	356.11	373.91	392.61	412.24	432.85	454.49	477.22	501.08	526.13	552.44	580.06	609.06	639.51	671.49
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		42.29	44.71	47.26	49.97	52.83	55.85	59.04	62.42	65.99	69.76	73.75	77.97	82.43	87.15	92.13	97.40	102.97	108.87	115.09	121.68
Depreciation	Rs Lakh		31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	13.63	13.63	13.63	13.63	13.63	13.63	13.63	13.63
Interest on term loan	Rs Lakh		46.36	42.33	38.30	34.27	30.24	26.20	22.17	18.14	14.11	10.08	6.05	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		19.34	23.64	24.63	25.68	26.78	27.94	29.17	30.46	31.82	33.26	34.92	36.52	37.84	39.71	41.67	43.73	45.89	48.17	50.56	53.07
Return on Equity	Rs Lakh		32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18
Total Fixed Cost	Rs Lakh		172.37	175.06	174.57	174.29	174.22	174.37	174.76	175.40	176.30	177.48	185.63	187.42	173.09	179.67	186.61	193.94	201.68	209.85	218.46	227.56
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
Variable COG	Rs/kWh	5.95	4.26	4.42	4.64	4.88	5.12	5.38	5.65	5.93	6.22	6.54	6.86	7.21	7.57	7.94	8.34	8.76	9.20	9.66	10.14	10.65
O&M expn	Rs/kWh	1.02	0.83	0.71	0.75	0.79	0.84	0.89	0.94	0.99	1.05	1.11	1.17	1.24	1.31	1.38	1.46	1.54	1.63	1.73	1.82	1.93
Depreciation	Rs/kWh	0.46	0.63	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Int. on term loan	Rs/kWh	0.39	0.91	0.67	0.61	0.54	0.48	0.42	0.35	0.29	0.22	0.16	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.49	0.38	0.37	0.39	0.41	0.42	0.44	0.46	0.48	0.50	0.53	0.55	0.58	0.60	0.63	0.66	0.69	0.73	0.76	0.80	0.84
RoE	Rs/kWh	0.56	0.64	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Total COG	Rs/kWh	8.86	7.66	7.20	7.41	7.64	7.88	8.14	8.42	8.71	9.02	9.35	9.81	10.18	10.31	10.79	11.30	11.83	12.39	12.98	13.60	14.25
Levillised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146
Variable Cost (FY2014-15)	4.26	Rs/Kwh																				
Levillised Tariff (Fixed)	2.92	Rs/Kwh																				
Applicable Tariff (FY2014-15)	7.18	Rs/Kwh																				



Determination of Accelerated Depreciation for Biomass Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional depreciation	20.00%
Income Tax (Normal Rates)	33.99%
Capital Cost	544.187

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	14.37	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	15.67	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	272.09	244.88	21.77	4.35	0.87	0.17	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	257.73	216.15	-6.97	-24.38	-27.86	-28.56	-28.70	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-15.67	0.00	0.00
Tax Benefit	Rs Lakh	87.60	73.47	-2.37	-8.29	-9.47	-9.71	-9.75	-9.76	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-5.33	0.00	0.00
Net Energy generation	MU	2.53	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	3.46	1.16	-0.04	-0.13	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.08	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15

Levelised benefit	0.17	(Rs/kWh)
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Assumption for Biomass Power Project Parameters			Select State	Others	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	Power Generation	Capacity	Installed Power Generation Cap.	MW	1
			Auxillary Consumption during sta	%	11%
			Auxillary Consumption after stabl	%	10%
			PLF(Stablization for 6 months)	%	60%
			PLF(during first year after Stabliz	%	70%
			PLF(second year onwards)	%	80%
			Useful Life	Years	20
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/M	544.187
3	Financial Assumptions	Debt: Equity	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	380.931
			Total Equity Amount	Rs Lacs	163.256
		Debt Component	Loan Amount	Rs Lacs	380.931
			Moratorium Period	years	0
			Repayment Period(inclد Morator	years	12
		Equity Component	Interest Rate	%	12.70%
			Equity amount	Rs Lacs	163.256
			Return on Equity for first 10 year	% p.a	20.00%
	Return on Equity after 10 years	%	24.00%		
	Weighted average of ROE	%	22.00%		
	Discount Rate (equiv. to WACC)	%	10.67%		
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%
			Depreciation		
		Depreciation Rate(power plant)	%	5.830%	
	Depreciation Rate 13th year onw	%	2.505%		
5	Working Capital	For Fixed Charges	O&M Charges	Months	1
			Maintenance Spare (% of O&M exepenses)		15%
		Receivables for Debtors	Months	2	
		For Variable Charges			
		Biomass Stock	Months	4	
	Interest On Working Capital	%	13.20%		
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	4200
			During Stablization Period	Kcal/kwh	4200
		Biomass	Base Price	Rs/T	2942.54
			GCV - Biomass	Kcal/kg	3100
	Biomass Price Escalation Factor		5.00%		
7	Operation & Maintenance	O&M Expenses (2014-15)	Rs Lacs	42.29	
		O & M Expenses Escalation	%	5.72%	
		O&M Expenses (2013-14)	Rs Lacs	40.00	



Determination of Tariff Component: Biomass Power Projects																						
Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		5.69	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
Auxiliary Consumption	MU		0.63	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Net Generation	MU		5.07	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Variable Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		227.00	293.35	308.02	323.42	339.59	356.57	374.40	393.12	412.78	433.42	455.09	477.84	501.74	526.82	553.16	580.82	609.86	640.36	672.37	705.99
Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		42.29	44.71	47.26	49.97	52.83	55.85	59.04	62.42	65.99	69.76	73.75	77.97	82.43	87.15	92.13	97.40	102.97	108.87	115.09	121.68
Depreciation	Rs Lakh		31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	13.63	13.63	13.63	13.63	13.63	13.63	13.63	13.63
Interest on term loan	Rs Lakh		46.36	42.33	38.30	34.27	30.24	26.20	22.17	18.14	14.11	10.08	6.05	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		20.09	24.61	25.65	26.74	27.90	29.12	30.40	31.76	33.18	34.69	36.42	38.10	39.50	41.45	43.49	45.64	47.90	50.29	52.78	55.40
Return on Equity	Rs Lakh		32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	32.65	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18	39.18
Total Fixed Cost	Rs Lakh		173.12	176.03	175.59	175.36	175.34	175.55	175.99	176.69	177.66	178.91	187.13	188.99	174.74	181.41	188.44	195.86	203.69	211.96	220.68	229.89
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
Variable COG	Rs/kWh	6.25	4.48	4.65	4.88	5.13	5.38	5.65	5.94	6.23	6.54	6.87	7.22	7.58	7.95	8.35	8.77	9.21	9.67	10.15	10.66	11.19
O&M expn	Rs/kWh	1.02	0.83	0.71	0.75	0.79	0.84	0.89	0.94	0.99	1.05	1.11	1.17	1.24	1.31	1.38	1.46	1.54	1.63	1.73	1.82	1.93
Depreciation	Rs/kWh	0.46	0.63	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Int. on term loan	Rs/kWh	0.39	0.91	0.67	0.61	0.54	0.48	0.42	0.35	0.29	0.22	0.16	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.51	0.40	0.39	0.41	0.42	0.44	0.46	0.48	0.50	0.53	0.55	0.58	0.60	0.63	0.66	0.69	0.72	0.76	0.80	0.84	0.88
RoE	Rs/kWh	0.56	0.64	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Total COG	Rs/kWh	9.19	7.90	7.44	7.67	7.91	8.16	8.44	8.73	9.03	9.36	9.71	10.18	10.57	10.73	11.23	11.76	12.31	12.90	13.51	14.16	14.84
Levillised Tariff	Unit	Year →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146
Variable Cost (FY2014-15)	4.48	Rs/kwh																				
Levillised Tariff (Fixed)	2.94	Rs/kwh																				
Applicable Tariff (FY2014-15)	7.42	Rs/kwh																				



Determination of Accelerated Depreciation for Biomass Power Project																					
Depreciation amount	90%																				
Book Depreciation rate	5.28%																				
Tax Depreciation rate	80%																				
Additional depreciation	20.00%																				
Income Tax (Normal Rates)	33.99%																				
Capital Cost	544.187																				
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	14.37	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	28.73	15.67	0.00	0.00
Accelerated Depreciation																					
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	272.09	244.88	21.77	4.35	0.87	0.17	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	257.73	216.15	-6.97	-24.38	-27.86	-28.56	-28.70	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-28.73	-15.67	0.00	0.00
Tax Benefit	Rs Lakh	87.60	73.47	-2.37	-8.29	-9.47	-9.71	-9.75	-9.76	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-9.77	-5.33	0.00	0.00
Net Energy generation	MU	2.53	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	3.46	1.16	-0.04	-0.13	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.08	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15
Levelling benefit	0.17 (Rs/kWh)																				



Non Fossil Fuel based co-generation Projects			Select State	AP	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	73	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Auxillary Consumption during stabilisation	%	8.50%
			Auxillary Consumption after stabilisation	%	8.50%
			PLF(Stablization for 6 months)	%	45%
			PLF(during first year after Stablization)	%	45%
			PLF(second year onwards)	%	45%
			Useful Life	Years	20
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	440.708
3	Financial Assumptions	Debt: Equity	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	308.496
			Total Equity Amout	Rs Lacs	132.212
		Debt Component	Loan Amount	Rs Lacs	308.50
			Moratorium Period	years	0
			Repayment Period(incld Moratorium)	years	12
			Interest Rate	%	12.70%
		Equity Component	Equity amount	Rs Lacs	132.21
			Return on Equity for first 10 years	% p.a	20.00%
			Return on Equity after 10 years	%	24.00%
			Weighted average of ROE	%	22.00%
			Discount Rate (equiv. to WACC)	%	10.67%
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%
		Depreciation	Depreciation Rate(power plant)	%	5.83%
			Depreciation Rate 13th year onwards	%	2.51%
5	Working Capital	For Fixed Charges	O&M Charges	Months	1
			Maintenance Spare	(% of O&M expenses)	15%
			Receivables for Debtors	Months	2
		For Variable Charges	Biomass Stock	Months	4
			Interest On Working Capital	%	13.20%
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	3600
			During Stablization Period	Kcal/kwh	3600
		Biomass	Bagasse Price	Rs/T	1553.27
			GCV - Bagasse	Kcal/kg	2250
			Bagasse Price Escalation Factor		5.00%
	Operation & Maintenance	O&M Expenses (2014-15)		Rs. Lacs	17.89
		O & M Expenses Escalation		%	5.72%
7		O&M Expenses (2013-14)		Rs. Lacs	16.92



Determination of Tariff for non-fossil fuel based co-generation Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94
Auxiliary Consumption	MU		0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Net Generation	MU		3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		17.89	18.91	19.99	21.14	22.35	23.62	24.97	26.40	27.91	29.51	31.20	32.98	34.87	36.86	38.97	41.20	43.56	46.05	48.68	51.47
Depreciation	Rs Lakh		25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	11.04	11.04	11.04	11.04	11.04	11.04	11.04	11.04
Interest on term loan	Rs Lakh		37.55	34.28	31.02	27.75	24.49	21.22	17.96	14.69	11.43	8.16	4.90	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		9.59	9.91	10.24	10.59	10.97	11.38	11.78	12.23	12.70	13.21	13.88	14.42	14.72	15.42	16.16	16.93	17.75	18.60	19.50	20.45
Return on Equity	Rs Lakh		26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73
Total Fixed Cost	Rs Lakh		117.16	115.24	113.38	111.62	109.93	108.34	106.85	105.46	104.18	103.01	107.38	106.46	92.36	95.05	97.90	100.90	104.07	107.42	110.96	114.69
Levallised tariff corresponding to Useful life																						
Per Unit Cost of Generation	Unit	Levallised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	3.83	2.72	2.85	2.99	3.14	3.30	3.47	3.64	3.82	4.01	4.21	4.42	4.65	4.88	5.12	5.38	5.65	5.93	6.23	6.54	6.86
O&M expn	Rs/kWh	0.74	0.50	0.52	0.55	0.59	0.62	0.65	0.69	0.73	0.77	0.82	0.86	0.91	0.97	1.02	1.08	1.14	1.21	1.28	1.35	1.43
Depreciation	Rs/kWh	0.64	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
Int. on term loan	Rs/kWh	0.53	1.04	0.95	0.86	0.77	0.68	0.59	0.50	0.41	0.32	0.23	0.14	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.34	0.27	0.27	0.28	0.29	0.30	0.32	0.33	0.34	0.35	0.37	0.38	0.40	0.41	0.43	0.45	0.47	0.49	0.52	0.54	0.57
RoE	Rs/kWh	0.77	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Total COG	Rs/kWh	6.84	5.96	6.05	6.14	6.24	6.35	6.47	6.60	6.75	6.90	7.07	7.40	7.60	7.44	7.76	8.09	8.44	8.81	9.20	9.61	10.04
Levallised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146
Variable Cost (FY2014-15)	2.72	Rs/kwh																				
Levallised Tariff (Fixed)	3.01	Rs/kwh																				
Applicable Tariff (FY2014-15)	5.73	Rs/kwh																				



Determination of Accelerated Depreciation for non-fossil fuel based co-generation project																						
Depreciation amount		90%																				
Book Depreciation rate		5.28%																				
Tax Depreciation rate		80%																				
Additional Depreciation		20.00%																				
Income Tax (Normal Rates)		33.990%																				
Capital Cost Rs. Lakh		440.708																				
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	11.63	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	12.69	0.00	0.00
Accelerated Depreciation																						
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	220.35	198.32	17.63	3.53	0.71	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	208.72	175.05	-5.64	-19.74	-22.56	-23.13	-23.24	-23.26	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-12.69	0.00	0.00
Tax Benefit	Rs Lakh	70.94	59.50	-1.92	-6.71	-7.67	-7.86	-7.90	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-4.31	0.00	0.00
Net Energy generation	MU	1.80	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61
Per unit benefit	Rs/Unit	3.93	1.65	-0.05	-0.19	-0.21	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.12	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	
Levellised benefit	0.24	(Rs/kWh)																				



Non Fossil Fuel based co-generation Projects			Select State	Harayana	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	73	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Auxillary Consumption during stabilisation	%	8.50%
			Auxillary Consumption after stabilisation	%	8.50%
			PLF(Stablization for 6 months)	%	53%
			PLF(during first year after Stablization)	%	53%
			PLF(second year onwards)	%	53%
			Useful Life	Years	20
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	440.708
3	Financial Assumptions	Debt: Equity	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	308.496
			Total Equity Amout	Rs Lacs	132.212
		Debt Component	Loan Amount	Rs Lacs	308.50
			Moratorium Period	years	0
			Repayment Period(incld Moratorium)	years	12
			Interest Rate	%	12.70%
		Equity Component	Equity amount	Rs Lacs	132.21
			Return on Equity for first 10 years	% p.a	20.00%
			Return on Equity after 10 years	%	24.00%
			Weighted average of ROE	%	22.00%
			Discount Rate (equiv. to WACC)	%	10.67%
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%
		Depreciation	Depreciation Rate(power plant)	%	5.83%
			Depreciation Rate 13th year onwards	%	2.51%
5	Working Capital	For Fixed Charges		Months	1
		O&M Charges	(% of O&M exepenses)		15%
		Maintenance Spare		Months	2
		Receivables for Debtors		Months	4
		For Variable Charges		Months	4
		Biomass Stock		Months	4
		Interest On Working Capital		%	13.20%
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	3600
			During Stablization Period	Kcal/kwh	3600
		Biomass	Bagasse Price	Rs/T	2209.27
			GCV - Bagasse	Kcal/kg	2250
			Bagasse Price Escalation Factor		5.00%
	Operation & Maintenance				
		O&M Expenses (2014-15)		Rs. Lacs	17.89
		O & M Expenses Escalation		%	5.72%
7		O&M Expenses (2013-14)		Rs. Lacs	16.92



Determination of Tariff for non-fossil fuel based co-generation Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64
Auxiliary Consumption	MU		0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Net Generation	MU		4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		17.89	18.91	19.99	21.14	22.35	23.62	24.97	26.40	27.91	29.51	31.20	32.98	34.87	36.86	38.97	41.20	43.56	46.05	48.68	51.47
Depreciation	Rs Lakh		25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	11.04	11.04	11.04	11.04	11.04	11.04	11.04	11.04
Interest on term loan	Rs Lakh		37.55	34.28	31.02	27.75	24.49	21.22	17.96	14.69	11.43	8.16	4.90	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		14.06	14.59	15.16	15.76	16.39	17.06	17.77	18.51	19.30	20.13	21.13	22.05	22.73	23.84	24.99	26.21	27.49	28.83	30.24	31.73
Return on Equity	Rs Lakh		26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73
Total Fixed Cost	Rs Lakh		121.63	119.92	118.31	116.78	115.36	114.04	112.83	111.74	110.78	109.94	114.65	114.09	100.37	103.47	106.74	110.18	113.82	117.65	121.70	125.97
Levelling 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
Variable COG	Rs/kWh	5.45	3.86	4.06	4.26	4.47	4.70	4.93	5.18	5.44	5.71	5.99	6.29	6.61	6.94	7.28	7.65	8.03	8.43	8.85	9.30	9.76
O&M expn	Rs/kWh	0.63	0.42	0.45	0.47	0.50	0.53	0.56	0.59	0.62	0.66	0.69	0.73	0.78	0.82	0.87	0.92	0.97	1.03	1.08	1.15	1.21
Depreciation	Rs/kWh	0.54	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Int. on term loan	Rs/kWh	0.45	0.88	0.81	0.73	0.65	0.58	0.50	0.42	0.35	0.27	0.19	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.44	0.33	0.34	0.36	0.37	0.39	0.40	0.42	0.44	0.45	0.47	0.50	0.52	0.54	0.56	0.59	0.62	0.65	0.68	0.71	0.75
RoE	Rs/kWh	0.66	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Total COG	Rs/kWh	8.16	6.73	6.88	7.04	7.22	7.41	7.62	7.83	8.07	8.32	8.58	8.99	9.29	9.30	9.72	10.16	10.63	11.11	11.62	12.16	12.73
Levelling Tariff	Unit	Year ->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146
Variable Cost (FY2014-15)	3.86	Rs/Kwh																				
Levelling Tariff (Fixed)	2.71	Rs/Kwh																				
Applicable Tariff (FY2014-15)	6.57	Rs/Kwh																				



Determination of Accelerated Depreciation for non-fossil fuel based co-generation project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost Rs. Lakh	440.708

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	11.63	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	12.69	0.00	0.00
Accelerated Depreciation																					
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	220.35	198.32	17.63	3.53	0.71	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	208.72	175.05	-5.64	-19.74	-22.56	-23.13	-23.24	-23.26	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-12.69	0.00	0.00
Tax Benefit	Rs Lakh	70.94	59.50	-1.92	-6.71	-7.67	-7.86	-7.90	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-4.31	0.00	0.00
Net Energy generation	MU	1.80	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61
Per unit benefit	Rs/Unit	3.93	1.65	-0.05	-0.19	-0.21	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.12	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15
Levellised benefit	0.24 (Rs/kWh)																				



Non Fossil Fuel based co-generation Projects			Select State	Maharashtra	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	73	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity Auxillary Consumption during stabilisation Auxillary Consumption after stabilisation PLF(Stablization for 6 months) PLF(during first year after Stablization) PLF(second year onwards) Useful Life	MW % % % % % Years	1 8.50% 8.50% 60% 60% 60% 20
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	440.708
3	Financial Assumptions	Debt: Equity Debt Component Equity Component	Debt Equity Total Debt Amount Total Equity Amount Loan Amount Moratorium Period Repayment Period(incl'd Moratorium) Interest Rate Equity amount Return on Equity for first 10 years Return on Equity after 10 years Weighted average of ROE Discount Rate (equiv. to WACC)	% % Rs Lacs Rs Lacs Rs Lacs years years % Rs Lacs % p.a % % %	70% 30% 308.496 132.212 308.50 0 12 12.70% 132.21 20.00% 24.00% 22.00% 10.67%
4	Financial Assumptions	Fiscal Assumptions Depreciation	Income Tax Depreciation Rate(power plant) Depreciation Rate 13th year onwards	% % %	33.990% 5.83% 2.51%
5	Working Capital	For Fixed Charges O&M Charges Maintenance Spare Receivables for Debtors For Variable Charges Biomass Stock Interest On Working Capital	(% of O&M exepenses)	Months Months Months %	1 15% 2 4 13.20%
6	Fuel Related Assumptions	Heat Rate Biomass	After Stabilisation period During Stablization Period Bagasse Price GCV - Bagasse Bagasse Price Escalation Factor	Kcal/kwh Kcal/kwh Rs/T Kcal/kg	3600 3600 2177.19 2250 5.00%
7	Operation & Maintenance	O&M Expenses (2014-15) O & M Expenses Escalation O&M Expenses (2013-14)		Rs. Lacs % Rs. Lacs	17.89 5.72% 16.92



Determination of Tariff for non-fossil fuel based co-generation Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26
Auxiliary Consumption	MU		0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Net Generation	MU		4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		17.89	18.91	19.99	21.14	22.35	23.62	24.97	26.40	27.91	29.51	31.20	32.98	34.87	36.86	38.97	41.20	43.56	46.05	48.68	51.47
Depreciation	Rs Lakh		25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	11.04	11.04	11.04	11.04	11.04	11.04	11.04	11.04
Interest on term loan	Rs Lakh		37.55	34.28	31.02	27.75	24.49	21.22	17.96	14.69	11.43	8.16	4.90	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		15.34	15.94	16.57	17.24	17.95	18.70	19.48	20.31	21.19	22.12	23.21	24.24	25.03	26.25	27.53	28.87	30.29	31.77	33.33	34.96
Return on Equity	Rs Lakh		26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73
Total Fixed Cost	Rs Lakh		122.91	121.27	119.72	118.27	116.92	115.68	114.55	113.55	112.67	111.93	116.73	116.28	102.67	105.89	109.27	112.85	116.61	120.59	124.78	129.20
Levallised tariff corresponding to Useful life																						
Per Unit Cost of Generation	Unit	Levallised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	5.37	3.81	4.00	4.20	4.41	4.63	4.86	5.10	5.36	5.62	5.91	6.20	6.51	6.84	7.18	7.54	7.91	8.31	8.73	9.16	9.62
O&M expn	Rs/kWh	0.55	0.37	0.39	0.42	0.44	0.46	0.49	0.52	0.55	0.58	0.61	0.65	0.69	0.73	0.77	0.81	0.86	0.91	0.96	1.01	1.07
Depreciation	Rs/kWh	0.48	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Int. on term loan	Rs/kWh	0.39	0.78	0.71	0.64	0.58	0.51	0.44	0.37	0.31	0.24	0.17	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.42	0.32	0.33	0.34	0.36	0.37	0.39	0.41	0.42	0.44	0.46	0.48	0.50	0.52	0.55	0.57	0.60	0.63	0.66	0.69	0.73
RoE	Rs/kWh	0.58	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Total COG	Rs/kWh	7.80	6.36	6.52	6.69	6.87	7.06	7.26	7.48	7.72	7.97	8.23	8.63	8.93	8.97	9.38	9.81	10.26	10.74	11.23	11.76	12.31
Levallised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146
Variable Cost (FY2014-15)	3.81	Rs/kwh																				
Levallised Tariff (Fixed)	2.43	Rs/kwh																				
Applicable Tariff (FY2014-15)	6.24	Rs/kwh																				



Determination of Accelerated Depreciation for non-fossil fuel based co-generation project																						
Depreciation amount		90%																				
Book Depreciation rate		5.28%																				
Tax Depreciation rate		80%																				
Additional Depreciation		20.00%																				
Income Tax (Normal Rates)		33.990%																				
Capital Cost Rs. Lakh		440.708																				
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	11.63	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	12.69	0.00	0.00
Accelerated Depreciation																						
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	220.35	198.32	17.63	3.53	0.71	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	208.72	175.05	-5.64	-19.74	-22.56	-23.13	-23.24	-23.26	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-12.69	0.00	0.00
Tax Benefit	Rs Lakh	70.94	59.50	-1.92	-6.71	-7.67	-7.86	-7.90	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-4.31	0.00	0.00
Net Energy generation	MU	1.80	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61
Per unit benefit	Rs/Unit	3.93	1.65	-0.05	-0.19	-0.21	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.12	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	
Levellised benefit	0.24	(Rs/kWh)																				



Non Fossil Fuel based co-generation Projects			Select State	Punjab		
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	73	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Auxillary Consumption during stabilisation	%	8.50%	
			Auxillary Consumption after stabilisation	%	8.50%	
			PLF(Stablization for 6 months)	%	53%	
			PLF(during first year after Stablization)	%	53%	
			PLF(second year onwards)	%	53%	
			Useful Life	Years	20	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	440.708	
3	Financial Assumptions	Debt: Equity	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	308.496	
			Total Equity Amout	Rs Lacs	132.212	
			Debt Component	Loan Amount	Rs Lacs	308.50
				Moratorium Period	years	0
				Repayment Period(incld Moratorium)	years	12
				Interest Rate	%	12.70%
			Equity Component	Equity amount	Rs Lacs	132.21
				Return on Equity for first 10 years	% p.a	20.00%
Return on Equity after 10 years	%	24.00%				
Weighted average of ROE	%	22.00%				
Discount Rate (equiv. to WACC)	%	10.67%				
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%	
			Depreciation	Depreciation Rate(power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.51%
5	Working Capital	For Fixed Charges O&M Charges Maintenance Spare Receivables for Debtors For Variable Charges Biomass Stock Interest On Working Capital	(% of O&M exepenses)	Months	1	
				15%		
				Months	2	
				Months	4	
				%	13.20%	
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	3600	
			During Stablization Period	Kcal/kwh	3600	
			Biomass	Bagasse Price	Rs/T	1944.26
				GCV - Bagasse	Kcal/kg	2250
				Bagasse Price Escalation Factor	%	5.00%
7	Operation & Maintenance	O&M Expenses (2014-15) O & M Expenses Escalation O&M Expenses (2013-14)	Rs. Lacs	17.89		
			%	5.72%		
			Rs. Lacs	16.92		



Determination of Tariff for non-fossil fuel based co-generation Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64
Auxiliary Consumption	MU		0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Net Generation	MU		4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		17.89	18.91	19.99	21.14	22.35	23.62	24.97	26.40	27.91	29.51	31.20	32.98	34.87	36.86	38.97	41.20	43.56	46.05	48.68	51.47
Depreciation	Rs Lakh		25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	11.04	11.04	11.04	11.04	11.04	11.04	11.04	11.04
Interest on term loan	Rs Lakh		37.55	34.28	31.02	27.75	24.49	21.22	17.96	14.69	11.43	8.16	4.90	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		12.73	13.20	13.70	14.22	14.78	15.37	15.99	16.64	17.34	18.07	18.96	19.78	20.35	21.33	22.36	23.45	24.59	25.79	27.05	28.37
Return on Equity	Rs Lakh		26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73
Total Fixed Cost	Rs Lakh		120.30	118.53	116.84	115.25	113.75	112.35	111.05	109.87	108.81	107.88	112.48	111.82	97.99	100.97	104.11	107.42	110.92	114.61	118.50	122.61
Levellised tariff corresponding to Useful life																						
Per Unit Cost of Generation	Unit	Levellised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	4.79	3.40	3.57	3.75	3.94	4.13	4.34	4.56	4.78	5.02	5.27	5.54	5.81	6.11	6.41	6.73	7.07	7.42	7.79	8.18	8.59
O&M expn	Rs/kWh	0.63	0.42	0.45	0.47	0.50	0.53	0.56	0.59	0.62	0.66	0.69	0.73	0.78	0.82	0.87	0.92	0.97	1.03	1.08	1.15	1.21
Depreciation	Rs/kWh	0.54	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Int. on term loan	Rs/kWh	0.45	0.88	0.81	0.73	0.65	0.58	0.50	0.42	0.35	0.27	0.19	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.39	0.30	0.31	0.32	0.33	0.35	0.36	0.38	0.39	0.41	0.43	0.45	0.47	0.48	0.50	0.53	0.55	0.58	0.61	0.64	0.67
RoE	Rs/kWh	0.66	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Total COG	Rs/kWh	7.46	6.23	6.36	6.50	6.65	6.81	6.98	7.17	7.37	7.58	7.81	8.19	8.45	8.41	8.79	9.18	9.60	10.03	10.49	10.97	11.48
Levellised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146
Variable Cost (FY2014-15)	3.40	Rs/Kwh																				
Levellised Tariff (Fixed)	2.66	Rs/Kwh																				
Applicable Tariff (FY2014-15)	6.06	Rs/Kwh																				



Determination of Accelerated Depreciation for non-fossil fuel based co-generation project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost Rs. Lakh	440.708

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	11.63	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	12.69	0.00	0.00
Accelerated Depreciation																					
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	220.35	198.32	17.63	3.53	0.71	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	208.72	175.05	-5.64	-19.74	-22.56	-23.13	-23.24	-23.26	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-12.69	0.00	0.00
Tax Benefit	Rs Lakh	70.94	59.50	-1.92	-6.71	-7.67	-7.86	-7.90	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-4.31	0.00	0.00
Net Energy generation	MU	1.80	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61
Per unit benefit	Rs/Unit	3.93	1.65	-0.05	-0.19	-0.21	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.12	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15
Levillised benefit	0.24 (Rs/kWh)																				



Non Fossil Fuel based co-generation Projects			Select State	TN	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	73	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Auxillary Consumption during stabilisation	%	8.50%
			Auxillary Consumption after stabilisation	%	8.50%
			PLF(Stablization for 6 months)	%	60%
			PLF(during first year after Stablization)	%	60%
			PLF(second year onwards)	%	60%
			Useful Life	Years	20
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	440.708
3	Financial Assumptions	Debt: Equity	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	308.496
			Total Equity Amount	Rs Lacs	132.212
		Debt Component	Loan Amount	Rs Lacs	308.50
			Moratorium Period	years	0
			Repayment Period(incl'd Moratorium)	years	12
			Interest Rate	%	12.70%
		Equity Component	Equity amount	Rs Lacs	132.21
			Return on Equity for first 10 years	% p.a	20.00%
			Return on Equity after 10 years	%	24.00%
			Weighted average of ROE	%	22.00%
			Discount Rate (equiv. to WACC)	%	10.67%
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%
		Depreciation	Depreciation Rate(power plant)	%	5.83%
			Depreciation Rate 13th year onwards	%	2.51%
5	Working Capital	For Fixed Charges			
		O&M Charges	(% of O&M exepenses)	Months	1
		Maintenance Spare			15%
		Receivables for Debtors		Months	2
		For Variable Charges			
		Biomass Stock		Months	4
		Interest On Working Capital		%	13.20%
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	3600
			During Stablization Period	Kcal/kwh	3600
		Biomass	Bagasse Price	Rs/T	1673.30
			GCV - Bagasse	Kcal/kg	2250
			Bagasse Price Escalation Factor		5.00%
	Operation & Maintenance				
		O&M Expenses (2014-15)		Rs. Lacs	17.89
		O & M Expenses Escalation		%	5.72%
7		O&M Expenses (2013-14)		Rs. Lacs	16.92

Determination of Tariff for non-fossil fuel based co-generation Projects																							
Units Generation		Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU			5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26
Auxiliary Consumption	MU			0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Net Generation	MU			4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81
Fixed Cost																							
O&M Expenses	Rs Lakh			17.89	18.91	19.99	21.14	22.35	23.62	24.97	26.40	27.91	29.51	31.20	32.98	34.87	36.86	38.97	41.20	43.56	46.05	48.68	51.47
Depreciation	Rs Lakh			25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	11.04	11.04	11.04	11.04	11.04	11.04	11.04	11.04
Interest on term loan	Rs Lakh			37.55	34.28	31.02	27.75	24.49	21.22	17.96	14.69	11.43	8.16	4.90	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh			12.48	12.94	13.42	13.93	14.47	15.05	15.65	16.29	16.97	17.68	18.55	19.35	19.90	20.86	21.87	22.93	24.04	25.21	26.44	27.74
Return on Equity	Rs Lakh			26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73
Total Fixed Cost	Rs Lakh			120.05	118.26	116.56	114.96	113.44	112.03	110.72	109.52	108.44	107.49	112.07	111.39	97.54	100.49	103.61	106.90	110.37	114.03	117.90	121.98
Levallised tariff corresponding to Useful life																							
Per Unit Cost of Generation		Unit	Levallised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	4.13		2.93	3.07	3.23	3.39	3.56	3.73	3.92	4.12	4.32	4.54	4.77	5.00	5.25	5.52	5.79	6.08	6.39	6.71	7.04	7.39
O&M expn	Rs/kWh	0.55		0.37	0.39	0.42	0.44	0.46	0.49	0.52	0.55	0.58	0.61	0.65	0.69	0.73	0.77	0.81	0.86	0.91	0.96	1.01	1.07
Depreciation	Rs/kWh	0.48		0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Int. on term loan	Rs/kWh	0.39		0.78	0.71	0.64	0.58	0.51	0.44	0.37	0.31	0.24	0.17	0.10	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.34		0.26	0.27	0.28	0.29	0.30	0.31	0.33	0.34	0.35	0.37	0.39	0.40	0.41	0.43	0.45	0.48	0.50	0.52	0.55	0.58
RoE	Rs/kWh	0.58		0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Total COG	Rs/kWh	6.47		5.42	5.53	5.65	5.78	5.92	6.06	6.22	6.39	6.58	6.77	7.10	7.32	7.28	7.61	7.95	8.31	8.68	9.08	9.49	9.93
Levallised Tariff																							
Discount Factor	Unit	Year -->		1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146
Variable Cost (FY2014-15)		2.93	Rs/kwh																				
Levallised Tariff (Fixed)		2.35	Rs/kwh																				
Applicable Tariff (FY2014-15)		5.27	Rs/kwh																				



Determination of Accelerated Depreciation for non-fossil fuel based co-generation project																						
Depreciation amount		90%																				
Book Depreciation rate		5.28%																				
Tax Depreciation rate		80%																				
Additional Depreciation		20.00%																				
Income Tax (Normal Rates)		33.990%																				
Capital Cost Rs. Lakh		440.708																				
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	11.63	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	12.69	0.00	0.00
Accelerated Depreciation																						
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	220.35	198.32	17.63	3.53	0.71	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	208.72	175.05	-5.64	-19.74	-22.56	-23.13	-23.24	-23.26	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-12.69	0.00	0.00
Tax Benefit	Rs Lakh	70.94	59.50	-1.92	-6.71	-7.67	-7.86	-7.90	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-4.31	0.00	0.00
Net Energy generation	MU	1.80	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61
Per unit benefit	Rs/Unit	3.93	1.65	-0.05	-0.19	-0.21	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.12	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	
Levellised benefit	0.24	(Rs/kWh)																				



Non Fossil Fuel based co-generation Projects			Select State	UP	
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	73	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity Auxillary Consumption during stabilisation Auxillary Consumption after stabilisation PLF(Stablization for 6 months) PLF(during first year after Stablization) PLF(second year onwards) Useful Life	MW % % % % % Years	1 8.50% 8.50% 45% 45% 45% 20
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	440.708
3	Financial Assumptions	Debt: Equity	Debt Equity Total Debt Amount Total Equity Amount	% % Rs Lacs Rs Lacs	70% 30% 308.496 132.212
		Debt Component	Loan Amount Moratorium Period Repayment Period(incl'd Moratorium) Interest Rate	Rs Lacs years years %	308.50 0 12 12.70%
		Equity Component	Equity amount Return on Equity for first 10 years Return on Equity after 10 years Weighted average of ROE Discount Rate (equiv. to WACC)	Rs Lacs % p.a % % %	132.21 20.00% 24.00% 22.00% 10.67%
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%
		Depreciation	Depreciation Rate(power plant) Depreciation Rate 13th year onwards	% %	5.83% 2.51%
5	Working Capital	For Fixed Charges O&M Charges Maintenance Spare Receivables for Debtors For Variable Charges Biomass Stock Interest On Working Capital	(% of O&M exepenses)	Months % Months Months %	1 15% 2 4 13.20%
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period During Stablization Period	Kcal/kwh Kcal/kwh	3600 3600
		Biomass	Bagasse Price GCV - Bagasse Bagasse Price Escalation Factor	Rs/T Kcal/kg	1732.72 2250 5.00%
	Operation & Maintenance	O&M Expenses (2014-15) O & M Expenses Escalation O&M Expenses (2013-14)		Rs. Lacs % Rs. Lacs	17.89 5.72% 16.92
7					



Determination of Tariff for non-fossil fuel based co-generation Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94
Auxiliary Consumption	MU		0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Net Generation	MU		3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		17.89	18.91	19.99	21.14	22.35	23.62	24.97	26.40	27.91	29.51	31.20	32.98	34.87	36.86	38.97	41.20	43.56	46.05	48.68	51.47
Depreciation	Rs Lakh		25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	11.04	11.04	11.04	11.04	11.04	11.04	11.04
Interest on term loan	Rs Lakh		37.55	34.28	31.02	27.75	24.49	21.22	17.96	14.69	11.43	8.16	4.90	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		10.36	10.71	11.08	11.48	11.89	12.34	12.81	13.31	13.83	14.39	15.10	15.72	16.09	16.86	17.67	18.52	19.41	20.35	21.34	22.38
Return on Equity	Rs Lakh		26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73
Total Fixed Cost	Rs Lakh		117.93	116.04	114.23	112.50	110.86	109.32	107.88	106.54	105.31	104.20	103.20	102.36	101.67	101.13	100.73	100.46	100.31	100.26	100.31	100.46
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
Variable COG	Rs/kWh	4.27	3.03	3.18	3.34	3.51	3.68	3.87	4.06	4.26	4.48	4.70	4.94	5.18	5.44	5.71	6.00	6.30	6.61	6.94	7.29	7.66
O&M expn	Rs/kWh	0.74	0.50	0.52	0.55	0.59	0.62	0.65	0.69	0.73	0.77	0.82	0.86	0.91	0.97	1.02	1.08	1.14	1.21	1.28	1.35	1.43
Depreciation	Rs/kWh	0.64	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
Int. on term loan	Rs/kWh	0.53	1.04	0.95	0.86	0.77	0.68	0.59	0.50	0.41	0.32	0.23	0.14	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.37	0.29	0.30	0.31	0.32	0.33	0.34	0.36	0.37	0.38	0.40	0.42	0.44	0.45	0.47	0.49	0.51	0.54	0.56	0.59	0.62
RoE	Rs/kWh	0.77	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Total COG	Rs/kWh	7.32	6.30	6.40	6.51	6.63	6.76	6.90	7.05	7.22	7.40	7.59	7.95	8.17	8.04	8.39	8.76	9.14	9.55	9.97	10.42	10.89
Levillised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146
Variable Cost (FY2014-15)	3.03	Rs/Kwh																				
Levillised Tariff (Fixed)	3.04	Rs/kwh																				
Applicable Tariff (FY2014-15)	6.07	Rs/Kwh																				



Determination of Accelerated Depreciation for non-fossil fuel based co-generation project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost Rs. Lakh	440.708

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	11.63	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	12.69	0.00	0.00
Accelerated Depreciation																						
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Accelerated Deprn.	Rs Lakh	220.35	198.32	17.63	3.53	0.71	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Net Depreciation Benefit	Rs Lakh	208.72	175.05	-5.64	-19.74	-22.56	-23.13	-23.24	-23.26	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-12.69	0.00	0.00	
Tax Benefit	Rs Lakh	70.94	59.50	-1.92	-6.71	-7.67	-7.86	-7.90	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-4.31	0.00	0.00	
Net Energy generation	MU	1.80	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	
Per unit benefit	Rs/Unit	3.93	1.65	-0.05	-0.19	-0.21	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.12	0.00	0.00	
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	
Levellised benefit	0.24 (Rs/kWh)																					



Non Fossil Fuel based co-generation Projects			Select State	Others		
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	73	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Auxillary Consumption during stabilisation	%	8.50%	
			Auxillary Consumption after stabilisation	%	8.50%	
			PLF(Stablization for 6 months)	%	53%	
			PLF(during first year after Stablization)	%	53%	
			PLF(second year onwards)	%	53%	
			Useful Life	Years	20	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	440.708	
3	Financial Assumptions	Debt: Equity	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	308.496	
			Total Equity Amout	Rs Lacs	132.212	
		Debt Component	Loan Amount	Rs Lacs	308.50	
			Moratorium Period	years	0	
			Repayment Period(incld Moratorium)	years	12	
			Interest Rate	%	12.70%	
		Equity Component	Equity amount	Rs Lacs	132.21	
			Return on Equity for first 10 years	% p.a	20.00%	
Return on Equity after 10 years	%		24.00%			
Weighted average of ROE	%		22.00%			
			Discount Rate (equiv. to WACC)	%	10.67%	
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%	
			Depreciation	Depreciation Rate(power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.51%
5	Working Capital	For Fixed Charges	O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			For Variable Charges			
			Biomass Stock	Months	4	
			Interest On Working Capital	%	13.20%	
6	Fuel Related Assumptions	Heat Rate	After Stabilisation period	Kcal/kwh	3600	
			During Stablization Period	Kcal/kwh	3600	
		Biomass	Bagasse Price	Rs/T	1881.27	
			GCV - Bagasse	Kcal/kg	2250	
			Bagasse Price Escalation Factor		5.00%	
7	Operation & Maintenance	O&M Expenses (2014-15)		Rs. Lacs	17.89	
			O & M Expenses Escalation	%	5.72%	
			O&M Expenses (2013-14)	Rs. Lacs	16.92	



Determination of Tariff for non-fossil fuel based co-generation Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.64
Auxiliary Consumption	MU		0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Net Generation	MU		4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
Fixed Cost																						
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		17.89	18.91	19.99	21.14	22.35	23.62	24.97	26.40	27.91	29.51	31.20	32.98	34.87	36.86	38.97	41.20	43.56	46.05	48.68	51.47
Depreciation	Rs Lakh		25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	25.69	11.04	11.04	11.04	11.04	11.04	11.04	11.04	11.04
Interest on term loan	Rs Lakh		37.55	34.28	31.02	27.75	24.49	21.22	17.96	14.69	11.43	8.16	4.90	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		12.41	12.87	13.35	13.86	14.39	14.96	15.56	16.20	16.87	17.58	18.45	19.24	19.78	20.74	21.74	22.79	23.90	25.06	26.29	27.57
Return on Equity	Rs Lakh		26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73	31.73
Total Fixed Cost	Rs Lakh		119.98	118.20	116.49	114.88	113.36	111.94	110.63	109.43	108.35	107.39	111.97	111.28	97.42	100.37	103.48	106.77	110.23	113.88	117.74	121.81
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
Variable COG	Rs/kWh	4.64	3.29	3.45	3.63	3.81	4.00	4.20	4.41	4.63	4.86	5.10	5.36	5.63	5.91	6.20	6.51	6.84	7.18	7.54	7.92	8.31
O&M expn	Rs/kWh	0.63	0.42	0.45	0.47	0.50	0.53	0.56	0.59	0.62	0.66	0.69	0.73	0.78	0.82	0.87	0.92	0.97	1.03	1.08	1.15	1.21
Depreciation	Rs/kWh	0.54	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Int. on term loan	Rs/kWh	0.45	0.88	0.81	0.73	0.65	0.58	0.50	0.42	0.35	0.27	0.19	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.38	0.29	0.30	0.31	0.33	0.34	0.35	0.37	0.38	0.40	0.41	0.43	0.45	0.47	0.49	0.51	0.54	0.56	0.59	0.62	0.65
RoE	Rs/kWh	0.66	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Total COG	Rs/kWh	7.29	6.11	6.24	6.37	6.51	6.67	6.83	7.01	7.20	7.41	7.63	7.99	8.25	8.20	8.57	8.95	9.35	9.78	10.22	10.69	11.18
Levillised Tariff																						
Levillised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146
Variable Cost (FY2014-15)	3.29	Rs/Kwh																				
Levillised Tariff (Fixed)	2.65	Rs/Kwh																				
Applicable Tariff (FY2014-15)	5.94	Rs/Kwh																				



Determination of Accelerated Depreciation for non-fossil fuel based co-generation project																						
Depreciation amount	90%																					
Book Depreciation rate	5.28%																					
Tax Depreciation rate	80%																					
Additional Depreciation	20.00%																					
Income Tax (Normal Rates)	33.990%																					
Capital Cost Rs. Lakh	440.708																					
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	11.63	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	23.27	12.69	0.00	0.00
Accelerated Depreciation																						
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	220.35	198.32	17.63	3.53	0.71	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	208.72	175.05	-5.64	-19.74	-22.56	-23.13	-23.24	-23.26	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-23.27	-12.69	0.00	0.00
Tax Benefit	Rs Lakh	70.94	59.50	-1.92	-6.71	-7.67	-7.86	-7.90	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-7.91	-4.31	0.00	0.00
Net Energy generation	MU	2.12	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
Per unit benefit	Rs/Unit	3.34	1.40	-0.05	-0.16	-0.18	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.10	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	
Levellised benefit	0.21	(Rs/kWh)																				



Assumption for Solar PV Power Projects Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Asumptions
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Auxiliary Consumption	%	0.00%
			Capacity Utilization Factor	%	19.0%
			Useful Life	Years	25
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	691
3	Financial Assumptions		Tariff Period	Years	25
			<u>Debt: Equity</u>		
			Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	483.70
			Total Equity Amout	Rs Lacs	207.30
			<u>Debt Component</u>		
			Loan Amount	Rs Lacs	483.70
			Moratorium Period	years	0
			Repayment Period(incld Moratorium)	years	12
			Interest Rate	%	12.70%
			<u>Equity Component</u>		
			Equity amount	Rs Lacs	207.30
Return on Equity for first 10 years	% p.a	20.00%			
Return on Equity 11th year onwards	% p.a	24.00%			
Weighted average of ROE		22.40%			
Discount Rate		10.67%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%
			<u>Depreciation</u>		
			Depreciation Rate for first 12 years	%	5.83%
			Depreciation Rate 13th year onwards	%	1.54%
5	Working Capital	<u>For Fixed Charges</u>			
		O&M Charges	(% of O&M exepenses)	Months	1
		Maintenance Spare		%	15%
		Receivables for Debtors		Months	2
		<u>For Variable Charges</u>			
		Interest On Working Capital		%	13.20%
6	Operation & Maintenance	O&M Expenses (2014-15)		Rs. Lacs	12.30
		O & M Expenses Escalation		%	5.72%
		O&M Expenses (2013-14)		Rs. Lacs	11.63



Determination of Tariff for Solar PV																											
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		1.664	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
Auxiliary Consumption	MU		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Net Generation			1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664	1.664
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		12.30	13.00	13.74	14.53	15.36	16.24	17.17	18.15	19.19	20.28	21.44	22.67	23.97	25.34	26.79	28.32	29.94	31.65	33.46	35.38	37.40	39.54	41.80	44.19	46.72
Depreciation	Rs Lakh		40.29	40.29	40.29	40.29	40.29	40.29	40.29	40.29	40.29	40.29	40.29	40.29	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65	10.65
Interest on term loan	Rs Lakh		58.87	53.75	48.63	43.51	38.39	33.27	28.16	23.04	17.92	12.80	7.68	2.56	0.00	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		3.83	3.75	3.67	3.60	3.53	3.46	3.40	3.34	3.28	3.22	3.36	3.31	2.65	2.73	2.80	2.89	2.98	3.07	3.17	3.27	3.38	3.49	3.62	3.74	3.88
Return on Equity	Rs Lakh		41.46	41.46	41.46	41.46	41.46	41.46	41.46	41.46	41.46	41.46	49.75	49.75	49.75	49.75	49.75	49.75	49.75	49.75	49.75	49.75	49.75	49.75	49.75	49.75	49.75
Total Fixed Cost	Rs Lakh		156.74	152.24	147.79	143.39	139.03	134.72	130.47	126.27	122.13	118.05	122.52	118.57	87.02	88.47	90.00	91.61	93.32	95.12	97.03	99.05	101.18	103.44	105.82	108.34	111.01
Levellised COG																											
Per Unit Cost of Generatio	Unit	Levellised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh	1.18	0.74	0.78	0.83	0.87	0.92	0.98	1.03	1.09	1.15	1.22	1.29	1.36	1.44	1.52	1.61	1.70	1.80	1.90	2.01	2.13	2.25	2.38	2.51	2.66	2.81
Depreciation	Rs/kWh	2.00	2.42	2.42	2.42	2.42	2.42	2.42	2.42	2.42	2.42	2.42	2.42	2.42	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Int. on term loan	Rs/kWh	1.69	3.54	3.23	2.92	2.61	2.31	2.00	1.69	1.38	1.08	0.77	0.46	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.21	0.23	0.23	0.22	0.22	0.21	0.20	0.20	0.20	0.19	0.20	0.20	0.20	0.16	0.16	0.17	0.17	0.18	0.18	0.19	0.20	0.20	0.21	0.22	0.22	0.23
RoE	Rs/kWh	2.64	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.99	2.99	2.99	2.99	2.99	2.99	2.99	2.99	2.99	2.99	2.99	2.99	2.99	2.99	2.99
Total COG	Rs/kWh		9.42	9.15	8.88	8.62	8.35	8.09	7.84	7.59	7.34	7.09	7.36	7.12	5.23	5.32	5.41	5.50	5.61	5.72	5.83	5.95	6.08	6.21	6.36	6.51	6.67
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146	0.132	0.119	0.108	0.097	0.088
Levellised Tariff	7.72	Rs/Unit																									



Determination of Accelerated Depreciation Benefit for Solar PV Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	691.0

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	18.24	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	36.48	19.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0%	0%	0%	0%	0%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50%	5%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	345.50	310.95	27.64	5.53	1.11	0.22	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	327.26	274.47	-8.84	-30.96	-35.38	-36.26	-36.44	-36.48	-36.48	-36.48	-36.48	-36.48	-36.48	-36.48	-36.48	-36.48	-36.48	-19.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	111.23	93.29	-3.01	-10.52	-12.03	-12.33	-12.39	-12.40	-12.40	-12.40	-12.40	-12.40	-12.40	-12.40	-12.40	-12.40	-12.40	-6.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	0.83	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.13	0.11	0.10	0.09

Levillised benefit	0.77	Rs/Unit
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Assumptions for Solar Thermal Power Projects Parameters						
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Capacity Utilization Factor	%	23.0%	
			Auxiliary Consumption Factor	%	10.0%	
			Useful Life	Years	25	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	1200.00	
3	Sources of Fund		Tariff Period	Years	25	
			<u>Debt: Equity</u>			
			Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	840	
			Total Equity Amount	Rs Lacs	360	
			<u>Debt Component</u>			
			Loan Amount	Rs Lacs	840.00	
			Moratorium Period	years	0	
			Repayment Period(incld Moratorium)	years	12	
			Interest Rate	%	12.70%	
			<u>Equity Component</u>			
			Equity amount	Rs Lacs	360.00	
Return on Equity for first 10 years	% p.a	20.00%				
Return on Equity 11th year onwards	% p.a	24.00%				
Weighted average of ROE	%	22.40%				
Discount Rate	%	10.67%				
4	Financial Assumptions		<u>Fiscal Assumptions</u>			
			Income Tax	%	33.990%	
			<u>Depreciation</u>			
			Depreciation Rate for first 12 years	%	5.83%	
			Depreciation Rate 13th year onwards	%	1.54%	
5	Working Capital		<u>For Fixed Charges</u>			
			O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	%	15%
			Receivables for Debtors	Months	2	
			<u>For Variable Charges</u>			
Interest On Working Capital	%	13.20%				
6	Operation & Maintenance		O&M Expenses (2014-15)	Rs Lacs	16.77	
			O & M Expenses Escalation	%	5.72%	
			O&M Expenses (2013-14)	Rs Lacs	15.86	



Determination of Tariff Component - (Solar Thermal)																											
Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Net Generation	MU		1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		16.77	17.73	18.74	19.81	20.95	22.14	23.41	24.75	26.16	27.66	29.24	30.92	32.68	34.55	36.53	38.62	40.83	43.17	45.63	48.24	51.00	53.92	57.01	60.27	63.71
Depreciation	Rs Lakh		69.96	69.96	69.96	69.96	69.96	69.96	69.96	69.96	69.96	69.96	69.96	69.96	69.96	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50
Interest on term loan	Rs Lakh		102.24	93.35	84.46	75.57	66.68	57.79	48.90	40.01	31.12	22.23	13.34	4.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		6.40	6.25	6.10	5.96	5.82	5.69	5.56	5.43	5.31	5.19	5.40	5.29	4.12	4.23	4.33	4.44	4.56	4.69	4.82	4.96	5.11	5.27	5.44	5.61	5.80
Return on Equity	Rs Lakh		72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40	86.40
Total Fixed Cost	Rs Lakh		267.36	259.26	251.26	243.30	235.40	227.58	219.82	212.14	204.55	197.03	204.33	197.01	141.71	143.68	145.76	147.96	150.29	152.75	155.36	158.11	161.02	164.09	167.34	170.78	174.41
Levilled COG																											
Per Unit Cost of Generation	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M expn	Rs/kWh	1.46	0.92	0.98	1.03	1.09	1.16	1.22	1.29	1.36	1.44	1.53	1.61	1.70	1.80	1.91	2.01	2.13	2.25	2.38	2.52	2.66	2.81	2.97	3.14	3.32	3.51
Depreciation	Rs/kWh	3.19	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Int. on term loan	Rs/kWh	2.69	5.64	5.15	4.66	4.17	3.68	3.19	2.70	2.21	1.72	1.23	0.74	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.31	0.35	0.34	0.34	0.33	0.32	0.31	0.31	0.30	0.29	0.29	0.30	0.29	0.23	0.23	0.24	0.25	0.25	0.26	0.27	0.27	0.28	0.29	0.30	0.31	0.32
RoE	Rs/kWh	4.22	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	3.97	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76	4.76
Total COG	Rs/kWh	11.88	14.74	14.30	13.86	13.42	12.98	12.55	12.12	11.70	11.28	10.87	11.27	10.86	7.81	7.92	8.04	8.16	8.29	8.42	8.57	8.72	8.88	9.05	9.23	9.42	9.62
Levilled Tariff	11.88	Rs/Unit																									



Determination of Accelerated Depreciation Benefit for Solar Thermal Power Projects

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	1200.0

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	31.68	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	63.36	34.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.002%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50.00%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.001%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.000%	0.00%	0.00%	0.00%	0.00%	0.00%	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	600.00	540.00	48.00	9.60	1.92	0.38	0.08	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	568.32	476.64	-15.36	-53.76	-61.44	-62.98	-63.28	-63.34	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-63.36	-34.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	193.17	162.01	-5.22	-18.27	-20.88	-21.41	-21.51	-21.53	-21.54	-21.54	-21.54	-21.54	-21.54	-21.54	-21.54	-21.54	-21.54	-11.75	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	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.13	0.11	0.10	0.09

Levellised benefit	123	Rs/Unit
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Select State

AP

Assumption for Biomass Gasifier Power Project Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Auxillary Consumption during stabilisation	%	10%	
			Auxillary Consumption after stabilisation	%	10%	
			PLF(Stabilization for 6 months)	%	85%	
			PLF(during first year after Stabilization)	%	85%	
			PLF(second year onwards)	%	85%	
			Useful Life	Years	20	
2	Project Cost		Power Plant Cost (before subsidy)		577.118	
		Capital Cost/MW	Power Plant Cost (after subsidy)	Rs Lacs/MW	427.118	
3	Financial Assumptions	<u>Debt: Equity</u>	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	298.983	
			Total Equity Amount	Rs Lacs	128.135	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	298.98
				Moratorium Period	years	0
				Repayment Period(inclcd Moratorium)	years	12
				Interest Rate	%	12.70%
			<u>Equity Component</u>	Equity amount	Rs Lacs	128.14
				Return on Equity for first 10 years	% p.a	20.00%
				Return on Equity after 10 years		24.00%
Weighted average of ROE		22.00%				
		Discount Rate (equiv. to WACC)		10.67%		
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%	
			<u>Depreciation</u>	Depreciation Rate(power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.51%
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>	Biomass Stock	Months	4
				Interest On Working Capital	%	13.20%
6	Fuel Related Assumptions	<u>Biomass</u>	Specific Fuel Consumption	kg/kWh	1.25	
			Base Price	Rs/T	2751.20	
			Biomass Price Escalation Factor		5.00%	
7	Operation & Maintenance	O & M Expemses (2014-15)	Rs Lacs	44.71		
		O & M Expemses Escalation	%	5.72%		
		O & M Expemses (2013-14)	Rs Lacs	42.29		



Determination of Tariff Component: Biomass Gasifier Power Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Gross Generation	MU		7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	
Auxiliary Consumption	MU		0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	
Net Generation	MU		6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	
Vaible Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		256.07	268.87	282.31	296.43	311.25	326.81	343.15	360.31	378.33	397.24	417.11	437.96	459.86	482.85	507.00	532.35	558.96	586.91	616.26	647.07
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		44.71	47.27	49.97	52.83	55.85	59.04	62.42	65.99	69.77	73.76	77.98	82.44	87.15	92.14	97.41	102.98	108.87	115.10	121.68	128.64
Depreciation	Rs Lakh		24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70
Interest on term loan	Rs Lakh		36.39	33.22	30.06	26.90	23.73	20.57	17.40	14.24	11.07	7.91	4.75	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		21.65	22.58	23.56	24.60	25.69	26.84	28.06	29.34	30.68	32.10	33.72	35.29	36.67	38.49	40.41	42.42	44.53	46.75	49.09	51.54
Return on Equity	Rs Lakh		25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75
Total Fixed Cost	Rs Lakh		163.28	163.60	164.12	164.86	165.80	166.98	168.41	160.09	162.06	164.30	172.09	174.97	166.28	172.08	179.27	186.86	194.86	203.30	212.22	221.64
Levallised tariff corresponding to Useful life																						
Per Unit Cost of Generation	Unit	Levallised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	6.39	3.82	4.01	4.21	4.42	4.64	4.88	5.12	5.38	5.65	5.93	6.22	6.54	6.86	7.21	7.57	7.94	8.34	8.76	9.20	9.66
O&M expn	Rs/kWh	0.99	0.67	0.71	0.75	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30	1.37	1.45	1.54	1.62	1.72	1.82	1.92
Depreciation	Rs/kWh	0.33	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Int. on term loan	Rs/kWh	0.27	0.54	0.50	0.45	0.40	0.35	0.31	0.26	0.21	0.17	0.12	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.44	0.32	0.34	0.35	0.37	0.38	0.40	0.42	0.44	0.46	0.48	0.50	0.53	0.55	0.57	0.60	0.63	0.66	0.70	0.73	0.77
RoE	Rs/kWh	0.40	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total COG	Rs/kWh	7.83	6.11	6.30	6.61	6.73	6.97	7.22	7.48	7.77	8.06	8.38	8.79	9.16	9.33	9.77	10.24	10.73	11.26	11.79	12.36	12.96
Levallised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.90	0.82	0.74	0.67	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.30	0.27	0.24	0.22	0.20	0.18	0.16	0.15
Variable Cost (FY 2014-15)	3.82	Rs/kwh																				
Levallised Tariff (Fixed)	2.44	Rs/kwh																				
Applicable Tariff (FY2014-16)	6.26	Rs/kwh																				



Determination of Accelerated Depreciation for Biomass Gasifier Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	427.118

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	11.28	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	12.30	0.00	0.00
Accelerated Depreciation																					
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	213.56	192.20	17.08	3.42	0.68	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	202.28	169.65	-5.47	-19.13	-21.87	-22.42	-22.52	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-12.30	0.00	0.00
Tax Benefit	Rs Lakh	68.76	57.66	-1.86	-6.50	-7.43	-7.62	-7.66	-7.66	-7.66	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-4.18	0.00	0.00
Net Energy generation	MU	3.35	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Per unit benefit	Rs/Unit	2.05	0.86	-0.03	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.06	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15
Levellised benefit	0.13 (Rs/kWh)																				



Select State

Hararyana

Assumption for Biomass Gasifier Power Project Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Auxillary Consumption during stabilisation	%	10%	
			Auxillary Consumption after stabilisation	%	10%	
			PLF(Stabilization for 6 months)	%	85%	
			PLF(during first year after Stabilization)	%	85%	
			PLF(second year onwards)	%	85%	
			Useful Life	Years	20	
			2	Project Cost	Capital Cost/MW	Power Plant Cost (before subsidy) Power Plant Cost (after subsidy)
3	Financial Assumptions	<u>Debt: Equity</u>	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	298.983	
			Total Equity Amount	Rs Lacs	128.135	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	298.98
				Moratorium Period	years	0
				Repayment Period(incl. Moratorium)	years	12
				Interest Rate	%	12.70%
			<u>Equity Component</u>	Equity amount	Rs Lacs	128.14
				Return on Equity for first 10 years	% p.a	20.00%
				Return on Equity after 10 years		24.00%
				Weighted average of ROE		22.00%
Discount Rate (equiv. to WACC)		10.67%				
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%	
			<u>Depreciation</u>	Depreciation Rate(power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.51%
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>	Biomass Stock	Months	4
				Interest On Working Capital	%	13.20%
			6	Fuel Related Assumptions	<u>Biomass</u>	Specific Fuel Consumption
Base Price	Rs/T	3131.50				
Biomass Price Escalation Factor		5.00%				
7	Operation & Maintenance	O & M Expenses (2014-15)				Rs Lacs
		O & M Expenses Escalation	%	5.72%		
		O & M Expenses (2013-14)	Rs Lacs	42.29		



Determination of Tariff Component: Biomass Gasifier Power Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45
Auxiliary Consumption	MU		0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Net Generation	MU		6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		291.46	306.04	321.34	337.41	354.28	371.99	390.59	410.12	430.63	452.16	474.76	498.50	523.43	549.60	577.08	605.93	636.23	668.04	701.44	736.52
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		44.71	47.27	49.97	52.83	55.85	59.04	62.42	65.99	69.77	73.76	77.98	82.44	87.15	92.14	97.41	102.98	108.87	115.10	121.68	128.64
Depreciation	Rs Lakh		24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70
Interest on term loan	Rs Lakh		36.39	33.22	30.06	26.90	23.73	20.57	17.40	14.24	11.07	7.91	4.75	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		24.04	25.09	26.20	27.36	28.59	29.89	31.26	32.70	34.21	35.81	37.61	39.38	40.96	43.00	45.14	47.38	49.75	52.23	54.84	57.58
Return on Equity	Rs Lakh		25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75
Total Fixed Cost	Rs Lakh		155.66	156.11	156.76	157.62	158.70	160.03	161.61	163.46	165.58	168.01	170.98	173.05	169.57	176.69	184.00	191.81	200.07	208.78	217.97	227.67
Levallised tariff corresponding to Useful life																						
Per Unit Cost of Generation	Unit	Levallised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	6.13	4.35	4.57	4.80	5.03	5.29	5.55	5.83	6.12	6.43	6.75	7.08	7.44	7.81	8.20	8.61	9.04	9.49	9.97	10.47	10.99
O&M expn	Rs/kWh	0.99	0.67	0.71	0.75	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30	1.37	1.45	1.54	1.62	1.72	1.82	1.92
Depreciation	Rs/kWh	0.33	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Int. on term loan	Rs/kWh	0.27	0.54	0.50	0.45	0.40	0.35	0.31	0.26	0.21	0.17	0.12	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.49	0.36	0.37	0.39	0.41	0.43	0.45	0.47	0.49	0.51	0.53	0.56	0.59	0.61	0.64	0.67	0.71	0.74	0.78	0.82	0.86
RoE	Rs/kWh	0.40	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total COG	Rs/kWh	8.63	6.67	6.90	7.13	7.39	7.66	7.94	8.24	8.66	9.00	9.26	9.71	10.11	10.34	10.84	11.36	11.90	12.48	13.08	13.72	14.39
Levallised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.90	0.82	0.74	0.67	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.30	0.27	0.24	0.22	0.20	0.18	0.16	0.15
Variable Cost (FY 2014-15)	4.35	Rs/kWh																				
Levallised Tariff (Fixed)	2.49	Rs/kWh																				
Applicable Tariff (FY2014-16)	6.84	Rs/kWh																				



Determination of Accelerated Depreciation for Biomass Gasifier Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	427.118

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	11.28	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	12.30	0.00	0.00
Accelerated Depreciation																					
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	213.56	192.20	17.08	3.42	0.68	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	202.28	169.65	-5.47	-19.13	-21.87	-22.42	-22.52	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-12.30	0.00	0.00
Tax Benefit	Rs Lakh	68.76	57.66	-1.86	-6.50	-7.43	-7.62	-7.66	-7.66	-7.66	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-4.18	0.00	0.00
Net Energy generation	MU	3.35	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Per unit benefit	Rs/Unit	2.05	0.86	-0.03	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.06	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15
Levellised benefit	0.13 (Rs/kWh)																				



Select State

Maharashtra

Assumption for Biomass Gasifier Power Project Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Auxillary Consumption during stabilisation	%	10%	
			Auxillary Consumption after stabilisation	%	10%	
			PLF(Stabilization for 6 months)	%	85%	
			PLF(during first year after Stabilization)	%	85%	
			PLF(second year onwards)	%	85%	
			Useful Life	Years	20	
2	Project Cost		Power Plant Cost (before subsidy)		577.118	
		Capital Cost/MW	Power Plant Cost (after subsidy)	Rs Lacs/MW	427.118	
3	Financial Assumptions	<u>Debt: Equity</u>	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	298.983	
			Total Equity Amount	Rs Lacs	128.135	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	298.98
				Moratorium Period	years	0
				Repayment Period(incl Moratorium)	years	12
				Interest Rate	%	12.70%
			<u>Equity Component</u>	Equity amount	Rs Lacs	128.14
				Return on Equity for first 10 years	% p.a	20.00%
				Return on Equity after 10 years		24.00%
				Weighted average of ROE		22.00%
	Discount Rate (equiv. to WACC)		10.67%			
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%	
			<u>Depreciation</u>	Depreciation Rate(power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.51%
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>	Biomass Stock	Months	4
				Interest On Working Capital	%	13.20%
6	Fuel Related Assumptions	<u>Biomass</u>	Specific Fuel Consumption	kg/kWh	1.25	
			Base Price	Rs/T	3202.80	
			Biomass Price Escalation Factor		5.00%	
7	Operation & Maintenance	O& M Expenses (2014-15)		Rs Lacs	44.71	
			O & M Expenses Escalation	%	5.72%	
			O& M Expenses (2013-14)	Rs Lacs	42.29	



Determination of Tariff Component: Biomass Gasifier Power Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45
Auxiliary Consumption	MU		0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Net Generation	MU		6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		298.10	313.01	328.66	345.09	362.34	380.46	399.48	419.46	440.43	462.45	485.57	509.85	535.35	562.11	590.22	619.73	650.72	683.25	717.42	753.29
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		44.71	47.27	49.97	52.83	55.85	59.04	62.42	65.99	69.77	73.76	77.98	82.44	87.15	92.14	97.41	102.98	108.87	115.10	121.68	128.64
Depreciation	Rs Lakh		24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90
Interest on term loan	Rs Lakh		36.39	33.22	30.06	26.90	23.73	20.57	17.40	14.24	11.07	7.91	4.75	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		24.49	25.56	26.69	27.88	29.14	30.46	31.86	33.33	34.87	36.51	38.34	40.15	41.77	43.84	46.02	48.31	50.72	53.26	55.92	58.71
Return on Equity	Rs Lakh		25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75
Total Fixed Cost	Rs Lakh		166.11	166.58	167.25	168.13	169.25	160.60	162.21	164.09	166.24	168.70	176.71	179.82	170.37	177.43	184.88	192.76	201.05	209.80	219.05	228.81
Levallised tariff corresponding to Useful life																						
Per Unit Cost of Generation	Unit	Levallised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	6.27	4.45	4.67	4.90	5.15	5.41	5.68	5.96	6.26	6.57	6.90	7.25	7.61	7.99	8.39	8.81	9.25	9.71	10.20	10.71	11.24
O&M expn	Rs/kWh	0.99	0.67	0.71	0.75	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30	1.37	1.45	1.54	1.62	1.72	1.82	1.92
Depreciation	Rs/kWh	0.33	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Int. on term loan	Rs/kWh	0.27	0.54	0.50	0.45	0.40	0.35	0.31	0.26	0.21	0.17	0.12	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.50	0.37	0.38	0.40	0.42	0.43	0.45	0.48	0.50	0.52	0.54	0.57	0.60	0.62	0.65	0.69	0.72	0.76	0.79	0.83	0.88
RoE	Rs/kWh	0.40	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total COG	Rs/kWh	8.77	6.78	7.01	7.25	7.61	7.78	8.07	8.38	8.71	9.05	9.42	9.88	10.29	10.63	11.04	11.57	12.12	12.71	13.33	13.97	14.66
Levallised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.90	0.82	0.74	0.67	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.30	0.27	0.24	0.22	0.20	0.18	0.16	0.15
Variable Cost (FY 2014-15)	4.45 Rs/kwh																					
Levallised Tariff (Fixed)	2.50 Rs/kwh																					
Applicable Tariff (FY2014-16)	6.95 Rs/kwh																					



Determination of Accelerated Depreciation for Biomass Gasifier Power Project																					
Depreciation amount		90%																			
Book Depreciation rate		5.28%																			
Tax Depreciation rate		80%																			
Additional Depreciation		20.00%																			
Income Tax (Normal Rates)		33.990%																			
Capital Cost		427.118																			
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	11.28	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	12.30	0.00	0.00
Accelerated Depreciation																					
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	213.56	192.20	17.08	3.42	0.68	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	202.28	169.65	-5.47	-19.13	-21.87	-22.42	-22.52	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-12.30	0.00	0.00
Tax Benefit	Rs Lakh	68.76	57.66	-1.86	-6.50	-7.43	-7.62	-7.66	-7.66	-7.66	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-4.18	0.00	0.00
Net Energy generation	MU	3.35	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Per unit benefit	Rs/Unit	2.06	0.86	-0.03	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.06	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15
Levelling benefit	0.13 (Rs/kWh)																				



Select State

Punjab

Assumption for Biomass Gasifier Power Project Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Auxillary Consumption during stabilisation	%	10%	
			Auxillary Consumption after stabilisation	%	10%	
			PLF (Stabilization for 6 months)	%	85%	
			PLF (during first year after Stabilization)	%	85%	
			PLF (second year onwards)	%	85%	
			Useful Life	Years	20	
2	Project Cost		Power Plant Cost (before subsidy)		577.118	
		Capital Cost/MW	Power Plant Cost (after subsidy)	Rs Lacs/MW	427.118	
3	Financial Assumptions	<u>Debt: Equity</u>	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	298.983	
			Total Equity Amount	Rs Lacs	128.135	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	298.98
				Moratorium Period	years	0
				Repayment Period (incl. Moratorium)	years	12
				Interest Rate	%	12.70%
			<u>Equity Component</u>	Equity amount	Rs Lacs	128.14
				Return on Equity for first 10 years	% p.a	20.00%
				Return on Equity after 10 years		24.00%
Weighted average of ROE		22.00%				
		Discount Rate (equiv. to WACC)		10.67%		
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%	
			<u>Depreciation</u>	Depreciation Rate (power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.51%
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>	Biomass Stock	Months	4
				Interest On Working Capital	%	13.20%
				6	Fuel Related Assumptions	<u>Biomass</u>
Base Price	Rs/T	3275.29				
Biomass Price Escalation Factor		5.00%				
7	Operation & Maintenance		O & M Expenses (2014-15)			
			O & M Expenses Escalation	%	5.72%	
			O & M Expenses (2013-14)	Rs Lacs	42.29	



Determination of Tariff Component: Biomass Gasifier Power Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Gross Generation	MU		7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	
Auxiliary Consumption	MU		0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	
Net Generation	MU		6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	
Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		304.85	320.09	336.09	352.90	370.54	389.07	408.53	428.95	450.40	472.92	496.57	521.39	547.46	574.84	603.58	633.76	665.44	698.72	733.65	770.34
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		44.71	47.27	49.97	52.83	55.85	59.04	62.42	65.99	69.77	73.76	77.98	82.44	87.15	92.14	97.41	102.98	108.87	115.10	121.68	128.64
Depreciation	Rs Lakh		24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90
Interest on term loan	Rs Lakh		36.39	33.22	30.06	26.90	23.73	20.57	17.40	14.24	11.07	7.91	4.75	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		24.94	26.04	27.19	28.41	29.69	31.04	32.47	33.97	35.55	37.21	39.08	40.92	42.58	44.70	46.92	49.26	51.72	54.30	57.01	59.86
Return on Equity	Rs Lakh		25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75
Total Fixed Cost	Rs Lakh		166.67	167.06	167.76	168.66	169.80	171.18	172.82	174.73	176.92	179.41	182.16	185.19	188.50	192.08	195.94	200.08	204.50	209.21	214.21	219.50
Levelling 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
Variable COG	Rs/kWh	6.42	4.55	4.78	5.02	5.27	5.53	5.81	6.10	6.40	6.72	7.06	7.41	7.78	8.17	8.58	9.01	9.46	9.93	10.43	10.95	11.50
O&M expn	Rs/kWh	0.99	0.67	0.71	0.75	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30	1.37	1.45	1.54	1.62	1.72	1.82	1.92
Depreciation	Rs/kWh	0.33	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Int. on term loan	Rs/kWh	0.27	0.54	0.50	0.45	0.40	0.35	0.31	0.26	0.21	0.17	0.12	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.61	0.37	0.39	0.41	0.42	0.44	0.46	0.48	0.51	0.53	0.56	0.58	0.61	0.64	0.67	0.70	0.74	0.77	0.81	0.85	0.89
RoE	Rs/kWh	0.40	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total COG	Rs/kWh	8.93	6.89	7.12	7.37	7.63	7.91	8.21	8.53	8.86	9.21	9.58	10.06	10.48	10.92	11.24	11.78	12.36	12.94	13.57	14.23	14.93
Levelling Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.90	0.82	0.74	0.67	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.30	0.27	0.24	0.22	0.20	0.18	0.16	0.15
Variable Cost (FY 2014-15)	4.55	Rs/kWh																				
Levelling Tariff (Fixed)	2.51	Rs/kWh																				
Applicable Tariff (FY2014-16)	7.06	Rs/kWh																				



Determination of Accelerated Depreciation for Biomass Gasifier Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	427.118

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	11.28	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	12.30	0.00	0.00	
Accelerated Depreciation																						
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Closing	%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Accelerated Depm.	Rs Lakh	213.56	192.20	17.08	3.42	0.68	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Net Depreciation Benefit	Rs Lakh	202.28	169.65	-5.47	-19.13	-21.87	-22.42	-22.52	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-12.30	0.00	0.00	
Tax Benefit	Rs Lakh	68.76	57.66	-1.86	-6.50	-7.43	-7.62	-7.66	-7.66	-7.66	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-4.18	0.00	0.00
Net Energy generation	MU	3.35	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	
Per unit benefit	Rs/Unit	2.05	0.86	-0.03	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.06	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	
Levillised benefit	0.13 (Rs/kWh)																					



Select State

Rajasthan

Assumption for Biomass Gasifier Power Project Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Auxillary Consumption during stabilisation	%	10%	
			Auxillary Consumption after stabilisation	%	10%	
			PLF (Stabilization for 6 months)	%	85%	
			PLF (during first year after Stabilization)	%	85%	
			PLF (second year onwards)	%	85%	
			Useful Life	Years	20	
2	Project Cost		Power Plant Cost (before subsidy)		577.118	
		Capital Cost/MW	Power Plant Cost (after subsidy)	Rs Lacs/MW	427.118	
3	Financial Assumptions	<u>Debt: Equity</u>	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	298.983	
			Total Equity Amount	Rs Lacs	128.135	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	298.98
				Moratorium Period	years	0
				Repayment Period (incl. Moratorium)	years	12
				Interest Rate	%	12.70%
			<u>Equity Component</u>	Equity amount	Rs Lacs	128.14
				Return on Equity for first 10 years	% p.a	20.00%
				Return on Equity after 10 years		24.00%
Weighted average of ROE		22.00%				
Discount Rate (equiv. to WACC)		10.67%				
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%	
			<u>Depreciation</u>	Depreciation Rate (power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.51%
			5	Working Capital	<u>For Fixed Charges</u>	O&M Charges
Maintenance Spare	(% of O&M exepenses)	15%				
Receivables for Debtors	Months	2				
<u>For Variable Charges</u>	Biomass Stock	Months				4
	Interest On Working Capital	%				13.20%
6	Fuel Related Assumptions	<u>Biomass</u>				Specific Fuel Consumption
			Base Price	Rs/T	2733.37	
			Biomass Price Escalation Factor		5.00%	
			7	Operation & Maintenance		O & M Expenses (2014-15)
O & M Expenses Escalation	%	5.72%				
O & M Expenses (2013-14)	Rs Lacs	42.29				



Determination of Tariff Component: Biomass Gasifier Power Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45
Auxiliary Consumption	MU		0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Net Generation	MU		6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		254.41	267.13	280.49	294.51	309.24	324.70	340.93	357.98	375.88	394.67	414.40	435.13	456.88	479.73	503.71	528.90	555.34	583.11	612.26	642.88
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		44.71	47.27	49.97	52.83	55.85	59.04	62.42	65.99	69.77	73.76	77.98	82.44	87.15	92.14	97.41	102.98	108.87	115.10	121.68	128.64
Depreciation	Rs Lakh		24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	10.70	10.70	10.70	10.70	10.70	10.70	10.70	10.70
Interest on term loan	Rs Lakh		36.39	33.22	30.06	26.90	23.73	20.57	17.40	14.24	11.07	7.91	4.75	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		21.54	22.46	23.44	24.47	25.55	26.70	27.91	29.18	30.52	31.93	33.53	35.10	36.47	38.28	40.18	42.18	44.29	46.50	48.82	51.26
Return on Equity	Rs Lakh		25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75
Total Fixed Cost	Rs Lakh		153.16	153.48	154.00	154.72	155.66	156.84	158.26	159.94	161.89	164.13	171.91	174.78	165.07	171.87	179.04	186.62	194.61	203.05	211.95	221.36
Levelling 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
Variable COG	Rs/kWh	5.35	3.80	3.99	4.19	4.39	4.61	4.85	5.09	5.34	5.61	5.89	6.18	6.49	6.82	7.16	7.52	7.89	8.29	8.70	9.14	9.59
O&M expn	Rs/kWh	0.99	0.67	0.71	0.75	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30	1.37	1.45	1.54	1.62	1.72	1.82	1.92
Depreciation	Rs/kWh	0.33	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Int. on term loan	Rs/kWh	0.27	0.54	0.50	0.45	0.40	0.35	0.31	0.26	0.21	0.17	0.12	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.44	0.32	0.34	0.35	0.37	0.38	0.40	0.42	0.44	0.46	0.48	0.50	0.52	0.54	0.57	0.60	0.63	0.66	0.69	0.73	0.76
RoE	Rs/kWh	0.40	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total COG	Rs/kWh	7.79	6.08	6.28	6.48	6.70	6.94	7.19	7.45	7.73	8.02	8.34	8.75	9.10	9.28	9.72	10.19	10.68	11.19	11.73	12.30	12.90
Levelling Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.90	0.82	0.74	0.67	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.30	0.27	0.24	0.22	0.20	0.18	0.16	0.15
Variable Cost (FY 2014-15)	3.80	Rs/kWh																				
Levelling Tariff (Fixed)	2.44	Rs/kWh																				
Applicable Tariff (FY2014-15)	6.24	Rs/kWh																				



Determination of Accelerated Depreciation for Biomass Gasifier Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	427.118

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	11.28	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	12.30	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	213.56	192.20	17.08	3.42	0.68	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	202.28	169.65	-5.47	-19.13	-21.87	-22.42	-22.52	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-12.30	0.00	0.00
Tax Benefit	Rs Lakh	68.76	57.66	-1.86	-6.50	-7.43	-7.62	-7.66	-7.66	-7.66	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-4.18	0.00	0.00
Net Energy generation	MU	3.35	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Per unit benefit	Rs/Unit	2.05	0.86	-0.03	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.06	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	

Levillised benefit **0.13** **(Rs/kWh)**



Select State

TN

Assumption for Biomass Gasifier Power Project Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Auxillary Consumption during stabilisation	%	10%	
			Auxillary Consumption after stabilisation	%	10%	
			PLF (Stabilization for 6 months)	%	85%	
			PLF (during first year after Stabilization)	%	85%	
			PLF (second year onwards)	%	85%	
			Useful Life	Years	20	
2	Project Cost		Power Plant Cost (before subsidy)		577.118	
		Capital Cost/MW	Power Plant Cost (after subsidy)	Rs Lacs/MW	427.118	
3	Financial Assumptions	<u>Debt: Equity</u>	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	298.983	
			Total Equity Amount	Rs Lacs	128.135	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	298.98
				Moratorium Period	years	0
				Repayment Period (incl. Moratorium)	years	12
				Interest Rate	%	12.70%
			<u>Equity Component</u>	Equity amount	Rs Lacs	128.14
				Return on Equity for first 10 years	% p.a	20.00%
				Return on Equity after 10 years		24.00%
Weighted average of ROE		22.00%				
Discount Rate (equiv. to WACC)		10.67%				
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%	
			<u>Depreciation</u>	Depreciation Rate (power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.51%
			5	Working Capital	<u>For Fixed Charges</u>	O&M Charges
Maintenance Spare	(% of O&M exepenses)	15%				
Receivables for Debtors	Months	2				
<u>For Variable Charges</u>	Biomass Stock	Months				4
	Interest On Working Capital	%				13.20%
6	Fuel Related Assumptions	<u>Biomass</u>				Specific Fuel Consumption
			Base Price	Rs/T	2706.03	
			Biomass Price Escalation Factor		5.00%	
			7	Operation & Maintenance		O & M Expensses (2014-15)
O & M Expensses Escalation	%	5.72%				
O & M Expensses (2013-14)	Rs Lacs	42.29				



Determination of Tariff Component: Biomass Gasifier Power Projects

Units Generation		Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU			7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45
Auxiliary Consumption	MU			0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Net Generation	MU			6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Variable Cost		Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh			251.86	264.46	277.68	291.56	306.14	321.45	337.52	354.40	372.12	390.72	410.26	430.77	452.31	474.93	498.67	523.61	549.79	577.28	606.14	636.45
Fixed Cost	Unit																						
O&M Expenses	Rs Lakh			44.71	47.27	49.97	52.83	55.85	59.04	62.42	65.99	69.77	73.76	77.98	82.44	87.15	92.14	97.41	102.98	108.87	115.10	121.68	128.64
Depreciation	Rs Lakh			24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90
Interest on term loan	Rs Lakh			36.39	33.22	30.06	26.90	23.73	20.57	17.40	14.24	11.07	7.91	4.75	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh			21.37	22.28	23.25	24.27	25.35	26.48	27.68	28.94	30.26	31.66	33.25	34.81	36.16	37.96	39.84	41.83	43.91	46.10	48.41	50.83
Return on Equity	Rs Lakh			25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75
Total Fixed Cost	Rs Lakh			152.99	153.30	153.81	154.52	155.46	156.62	158.03	159.70	161.63	163.86	171.63	174.48	164.77	171.55	178.70	186.26	194.23	202.65	211.54	220.92
Levallised tariff corresponding to Useful life																							
Per Unit Cost of Generation		Unit	Levallised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh		5.30	3.76	3.95	4.14	4.35	4.57	4.80	5.04	5.29	5.55	5.83	6.12	6.43	6.75	7.09	7.44	7.81	8.20	8.61	9.04	9.50
O&M expn	Rs/kWh		0.99	0.67	0.71	0.75	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30	1.37	1.45	1.54	1.62	1.72	1.82	1.92
Depreciation	Rs/kWh		0.33	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Int. on term loan	Rs/kWh		0.27	0.54	0.50	0.45	0.40	0.35	0.31	0.26	0.21	0.17	0.12	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.43	0.32	0.33	0.35	0.36	0.38	0.40	0.41	0.43	0.45	0.47	0.50	0.52	0.54	0.57	0.59	0.62	0.66	0.69	0.72	0.76
RoE	Rs/kWh		0.40	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total COG	Rs/kWh		7.74	6.04	6.23	6.44	6.66	6.89	7.13	7.39	7.67	7.96	8.28	8.68	9.03	9.21	9.65	10.11	10.59	11.10	11.64	12.20	12.79
Levallised Tariff		Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor				1	0.90	0.82	0.74	0.67	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.30	0.27	0.24	0.22	0.20	0.18	0.16	0.15
Variable Cost (FY 2014-15)	3.76	Rs/kwh																					
Levallised Tariff (Fixed)	2.44	Rs/kwh																					
Applicable Tariff (FY2014-15)	6.19	Rs/kwh																					



Determination of Accelerated Depreciation for Biomass Gasifier Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	427.118

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	11.28	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	12.30	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	213.56	192.20	17.08	3.42	0.68	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	202.28	169.65	-5.47	-19.13	-21.87	-22.42	-22.52	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-12.30	0.00	0.00
Tax Benefit	Rs Lakh	68.76	57.66	-1.86	-6.50	-7.43	-7.62	-7.66	-7.66	-7.66	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-4.18	0.00	0.00
Net Energy generation	MU	3.35	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Per unit benefit	Rs/Unit	2.05	0.86	-0.03	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.06	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	

Levelling benefit **0.13** **(Rs/kWh)**



Select State

UP

Assumption for Biomass Gasifier Power Project Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Auxillary Consumption during stabilisation	%	10%	
			Auxillary Consumption after stabilisation	%	10%	
			PLF (Stabilization for 6 months)	%	85%	
			PLF (during first year after Stabilization)	%	85%	
			PLF (second year onwards)	%	85%	
			Useful Life	Years	20	
2	Project Cost		Power Plant Cost (before subsidy)		577.118	
		Capital Cost/MW	Power Plant Cost (after subsidy)	Rs Lacs/MW	427.118	
3	Financial Assumptions	<u>Debt: Equity</u>	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	298.983	
			Total Equity Amount	Rs Lacs	128.135	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	298.98
				Moratorium Period	years	0
				Repayment Period (incl. Moratorium)	years	12
				Interest Rate	%	12.70%
			<u>Equity Component</u>	Equity amount	Rs Lacs	128.14
				Return on Equity for first 10 years	% p.a	20.00%
				Return on Equity after 10 years		24.00%
Weighted average of ROE		22.00%				
Discount Rate (equiv. to WACC)		10.67%				
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%	
			<u>Depreciation</u>	Depreciation Rate (power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.51%
			5	Working Capital	<u>For Fixed Charges</u>	O&M Charges
Maintenance Spare	(% of O&M exepenses)	15%				
Receivables for Debtors	Months	2				
<u>For Variable Charges</u>	Biomass Stock	Months				4
	Interest On Working Capital	%				13.20%
6	Fuel Related Assumptions	<u>Biomass</u>				Specific Fuel Consumption
			Base Price	Rs/T	2798.73	
			Biomass Price Escalation Factor		5.00%	
			7	Operation & Maintenance		O & M Expenses (2014-15)
O & M Expenses Escalation	%	5.72%				
O & M Expenses (2013-14)	Rs Lacs	42.29				



Determination of Tariff Component: Biomass Gasifier Power Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45
Auxiliary Consumption	MU		0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Net Generation	MU		6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		260.49	273.52	287.19	301.55	316.63	332.46	349.08	366.54	384.87	404.11	424.31	445.53	467.81	491.20	515.76	541.54	568.62	597.05	626.91	658.25
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		44.71	47.27	49.97	52.83	55.85	59.04	62.42	65.99	69.77	73.76	77.98	82.44	87.15	92.14	97.41	102.98	108.87	115.10	121.68	128.64
Depreciation	Rs Lakh		24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90
Interest on term loan	Rs Lakh		36.39	33.22	30.06	26.90	23.73	20.57	17.40	14.24	11.07	7.91	4.75	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		21.95	22.89	23.89	24.94	26.05	27.22	28.46	29.76	31.12	32.57	34.20	35.80	37.21	39.05	41.00	43.04	45.18	47.44	49.81	52.30
Return on Equity	Rs Lakh		25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75
Total Fixed Cost	Rs Lakh		153.57	153.91	154.45	155.20	156.16	157.36	158.81	160.52	162.50	164.76	172.58	175.48	165.81	172.64	179.86	187.47	195.51	203.99	212.94	222.39
Levallised tariff corresponding to Useful life																						
Per Unit Cost of Generation	Unit	Levallised	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/kWh	5.48	3.89	4.08	4.29	4.50	4.72	4.96	5.21	5.47	5.74	6.03	6.33	6.65	6.98	7.33	7.70	8.08	8.49	8.91	9.35	9.82
O&M expn	Rs/kWh	0.99	0.67	0.71	0.75	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30	1.37	1.45	1.54	1.62	1.72	1.82	1.92
Depreciation	Rs/kWh	0.33	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Int. on term loan	Rs/kWh	0.27	0.54	0.50	0.45	0.40	0.35	0.31	0.26	0.21	0.17	0.12	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.45	0.33	0.34	0.36	0.37	0.39	0.41	0.42	0.44	0.46	0.49	0.51	0.53	0.56	0.58	0.61	0.64	0.67	0.71	0.74	0.78
RoE	Rs/kWh	0.40	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total COG	Rs/kWh	7.93	6.18	6.38	6.59	6.82	7.06	7.31	7.58	7.86	8.17	8.49	8.91	9.27	9.46	9.91	10.38	10.88	11.40	11.95	12.53	13.14
Levallised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.90	0.82	0.74	0.67	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.30	0.27	0.24	0.22	0.20	0.18	0.16	0.15
Variable Cost (FY 2014-15)	3.89	Rs/Kwh																				
Levallised Tariff (Fixed)	2.45	Rs/Kwh																				
Applicable Tariff (FY2014-15)	6.34	Rs/Kwh																				



Determination of Accelerated Depreciation for Biomass Gasifier Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional Depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	427.118

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	11.28	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	12.30	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	213.56	192.20	17.08	3.42	0.68	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	202.28	169.65	-5.47	-19.13	-21.87	-22.42	-22.52	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-12.30	0.00	0.00
Tax Benefit	Rs Lakh	68.76	57.66	-1.86	-6.50	-7.43	-7.62	-7.66	-7.66	-7.66	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-4.18	0.00	0.00
Net Energy generation	MU	3.35	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Per unit benefit	Rs/Unit	2.05	0.86	-0.03	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.06	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	
Levillised benefit	0.13 (Rs/kWh)																					



Select State

Others

Assumption for Biomass Gasifier Power Project Parameters

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Auxillary Consumption during stabilisation	%	10%	
			Auxillary Consumption after stabilisation	%	10%	
			PLF (Stabilization for 6 months)	%	85%	
			PLF (during first year after Stabilization)	%	85%	
			PLF (second year onwards)	%	85%	
			Useful Life	Years	20	
2	Project Cost		Power Plant Cost (before subsidy)		577.118	
		Capital Cost/MW	Power Plant Cost (after subsidy)	Rs Lacs/MW	427.118	
3	Financial Assumptions	<u>Debt: Equity</u>	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	298.983	
			Total Equity Amount	Rs Lacs	128.135	
			<u>Debt Component</u>	Loan Amount	Rs Lacs	298.98
				Moratorium Period	years	0
				Repayment Period (incl'd Moratorium)	years	12
				Interest Rate	%	12.70%
			<u>Equity Component</u>	Equity amount	Rs Lacs	128.14
				Return on Equity for first 10 years	% p.a	20.00%
				Return on Equity after 10 years		24.00%
Weighted average of ROE		22.00%				
		Discount Rate (equiv. to WACC)		10.67%		
4	Financial Assumptions	<u>Fiscal Assumptions</u>	Income Tax	%	33.990%	
			<u>Depreciation</u>	Depreciation Rate (power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.51%
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>	Biomass Stock	Months	4
				Interest On Working Capital	%	13.20%
				6	Fuel Related Assumptions	<u>Biomass</u>
Base Price	Rs/T	2942.54				
Biomass Price Escalation Factor		5.00%				
7	Operation & Maintenance		O & M Expensses (2014-15)			
			O & M Expensses Escalation	%	5.72%	
			O & M Expensses (2013-14)	Rs Lacs	42.29	



Determination of Tariff Component: Biomass Gasifier Power Projects																						
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45
Auxiliary Consumption	MU		0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Net Generation	MU		6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		273.88	287.57	301.95	317.05	332.90	349.54	367.02	385.37	404.64	424.87	446.12	468.42	491.84	516.44	542.26	569.37	597.84	627.73	659.12	692.07
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		44.71	47.27	49.97	52.83	55.85	59.04	62.42	65.99	69.77	73.76	77.98	82.44	87.15	92.14	97.41	102.98	108.87	115.10	121.68	128.64
Depreciation	Rs Lakh		24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90	24.90
Interest on term loan	Rs Lakh		36.39	33.22	30.06	26.90	23.73	20.57	17.40	14.24	11.07	7.91	4.75	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		22.85	23.84	24.89	25.99	27.15	28.38	29.67	31.03	32.46	33.97	35.67	37.35	38.83	40.76	42.79	44.92	47.16	49.51	51.98	54.58
Return on Equity	Rs Lakh		25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	25.63	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75	30.75
Total Fixed Cost	Rs Lakh		154.48	154.86	155.45	156.24	157.26	158.52	160.02	161.79	163.83	166.17	174.05	177.02	167.43	174.35	181.65	189.35	197.48	206.06	215.12	224.68
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
Variable COG	Rs/kWh	5.76	4.09	4.29	4.51	4.73	4.97	5.22	5.48	5.75	6.04	6.34	6.66	6.99	7.34	7.71	8.09	8.50	8.92	9.37	9.84	10.33
O&M expn	Rs/kWh	0.99	0.67	0.71	0.75	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30	1.37	1.45	1.54	1.62	1.72	1.82	1.92
Depreciation	Rs/kWh	0.33	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Int. on term loan	Rs/kWh	0.27	0.54	0.50	0.45	0.40	0.35	0.31	0.26	0.21	0.17	0.12	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.47	0.34	0.36	0.37	0.39	0.41	0.42	0.44	0.46	0.48	0.51	0.53	0.56	0.58	0.61	0.64	0.67	0.70	0.74	0.78	0.81
RoE	Rs/kWh	0.40	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total COG	Rs/kWh	8.23	6.39	6.60	6.83	7.06	7.31	7.58	7.86	8.16	8.48	8.82	9.25	9.63	9.94	10.31	10.80	11.32	11.87	12.44	13.05	13.68
Levillised Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.90	0.82	0.74	0.67	0.60	0.54	0.49	0.44	0.40	0.36	0.33	0.30	0.27	0.24	0.22	0.20	0.18	0.16	0.15
Variable Cost (FY 2014-15)	4.09	Rs/kWh																				
Levillised Tariff (Fixed)	2.47	Rs/kWh																				
Applicable Tariff (FY2014-15)	6.55	Rs/kWh																				



Determination of Accelerated Depreciation for Biomass Gasifier Power Project																						
Depreciation amount	90%																					
Book Depreciation rate	5.28%																					
Tax Depreciation rate	80%																					
Additional Depreciation	20.00%																					
Income Tax (Normal Rates)	33.990%																					
Capital Cost	427.118																					
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	11.28	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	22.55	12.30	0.00	0.00
Accelerated Depreciation																						
Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	213.56	192.20	17.08	3.42	0.68	0.14	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lakh	202.28	169.65	-5.47	-19.13	-21.87	-22.42	-22.52	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-22.55	-12.30	0.00	0.00
Tax Benefit	Rs Lakh	68.76	57.66	-1.86	-6.50	-7.43	-7.62	-7.66	-7.66	-7.66	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-7.67	-4.18	0.00	0.00
Net Energy generation	MU	3.35	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70	6.70
Per unit benefit	Rs/Unit	2.05	0.86	-0.03	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.06	0.00	0.00
Discounting Factor		1.00	0.95	0.86	0.78	0.70	0.63	0.57	0.52	0.47	0.42	0.38	0.34	0.31	0.28	0.25	0.23	0.21	0.19	0.17	0.15	
Levelling benefit	0.13 (Rs/kWh)																					



Assumption for Biogas Based Power Project Parameters						
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions	
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1	
			Auxillary Consumption during stabilisation	%	12%	
			PLF	%	90%	
			Useful Life	Years	20	
2	Project Cost	Capital Cost/MW	Power Plant Cost (before subsidy)	Rs Lacs/MW	1154.236	
			Power Plant Cost (after subsidy)	Rs Lacs/MW	854.236	
3	Financial Assumptions	Debt: Equity	Debt	%	70%	
			Equity	%	30%	
			Total Debt Amount	Rs Lacs	597.965	
			Total Equity Amount	Rs Lacs	256.271	
			Debt Component	Loan Amount	Rs Lacs	597.97
				Moratorium Period	years	0
				Repayment Period(incld Moratorium)	years	12
				Interest Rate	%	12.70%
			Equity Component	Equity amount	Rs Lacs	256.27
				Return on Equity for first 10 years	% p.a	20.00%
				Return on Equity after 10 years	%	24.00%
Weighted average of ROE	%	22.00%				
Discount Rate (equiv. to WACC)	%	10.67%				
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.990%	
			Depreciation	Depreciation Rate(power plant)	%	5.83%
				Depreciation Rate 13th year onwards	%	2.51%
5	Working Capital	For Fixed Charges	O&M Charges	Months	1	
			Maintenance Spare	(% of O&M exepenses)	15%	
			Receivables for Debtors	Months	2	
			For Variable Charges	Biomass Stock	Months	4
				Interest On Working Capital	%	13.20%
6	Fuel Related Assumptions	Biomass	Fuel Price	Rs/T	1176.54	
			Specific Fuel Consumption	kg/kWh	3	
			Substrates Price Escalation Factor		5.00%	
			7	Operation & Maintenance	O&M Expenses (2014-15)	O&M Expenses (2014-15)
Total O & M Expenses Escalation	%	5.72%				
O&M Expenses (2013-14)	Rs Lacs	42.29				



Determination of Tariff Component: Biogas Based Power Projects

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88
Auxiliary Consumption	MU		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Net Generation	MU		6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94

Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		278.28	292.19	306.80	322.14	338.25	355.16	372.92	391.56	411.14	431.70	453.28	475.95	499.74	524.73	550.97	578.51	607.44	637.81	669.70	703.19

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		44.71	47.27	49.97	52.83	55.85	59.04	62.42	65.99	69.77	73.76	77.98	82.44	87.15	92.14	97.41	102.98	108.87	115.10	121.68	128.64
Depreciation	Rs Lakh		49.80	49.80	49.80	49.80	49.80	49.80	49.80	49.80	49.80	49.80	49.80	49.80	21.40	21.40	21.40	21.40	21.40	21.40	21.40	21.40
Interest on term loan	Rs Lakh		72.78	66.45	60.12	53.79	47.46	41.14	34.81	28.48	22.15	15.82	9.49	3.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		25.10	26.04	27.03	28.07	29.18	30.35	31.59	32.90	34.28	35.74	37.52	39.14	40.30	42.25	44.31	46.47	48.74	51.12	53.63	56.26
Return on Equity	Rs Lakh		51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25	51.25
Total Fixed Cost	Rs Lakh		243.65	240.81	238.17	235.75	233.55	231.59	229.88	228.43	227.26	226.38	236.29	236.05	210.35	217.29	224.62	232.35	240.51	249.12	258.21	267.81

Levelling Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.904	0.816	0.738	0.667	0.602	0.544	0.492	0.444	0.402	0.363	0.328	0.296	0.268	0.242	0.219	0.198	0.178	0.161	0.146

Variable Cost (FY2014-15)	4.01	Rs/Kwh
Levelling Tariff (Fixed)	3.39	Rs/Kwh
Applicable Tariff (FY2014-15)	7.40	Rs/Kwh



Determination of Accelerated Depreciation for Biogas based Power Project

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Additional depreciation	20.00%
Income Tax (Normal Rates)	33.990%
Capital Cost	854.236

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	22.55	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	45.10	24.60	0.00	0.00

Accelerated Depreciation

Opening	%	100.00%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allowed during the year	%	50%	45.00%	4.00%	0.80%	0.16%	0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	50.00%	5.00%	1.00%	0.20%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	427.12	384.41	34.17	6.83	1.37	0.27	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

Net Depreciation Benefit	Rs Lakh	404.57	339.30	-10.93	-38.27	-43.74	-44.83	-45.05	-45.09	-45.10	-45.10	-45.10	-45.10	-45.10	-45.10	-45.10	-45.10	-45.10	-45.10	-24.60	0.00	0.00
Tax Benefit	Rs Lakh	137.51	115.33	-3.72	-13.01	-14.87	-15.24	-15.31	-15.33	-15.33	-15.33	-15.33	-15.33	-15.33	-15.33	-15.33	-15.33	-15.33	-15.33	-8.36	0.00	0.00
Net Energy generation	MU	3.47	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94
Per unit benefit	Rs/Unit	3.96	1.66	-0.05	-0.19	-0.21	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.22	-0.12	0.00	0.00
Discounting Factor		3.60	3.42	3.08	2.78	2.51	2.26	2.04	1.83	1.65	1.49	1.34	1.21	1.09	0.98	0.89	0.80	0.72	0.65	0.59	0.53	
Levillised benefit	0.25 (Rs/kWh)																					

