

RAJASTHAN ELECTRICITY REGULATORY COMMISSION, JAIPUR

In the matter of determination of generic tariff for sale of electricity from Biomass and Biogas based power plants in the State to Distribution Licensee getting commissioned during FY 2014-15 and revised energy charges of the Biomass power plants commissioned during the period 2009-2014.

Coram:

1. Shri Vishvanath Hiremath, Chairman
2. Shri S. Dhawan, Member
3. Shri Vinod Pandya, Member

Date of Hearing: 03.07.2014

Date of Order: 23.07.2014

ORDER

1. The RERC (Terms and Conditions for Determination of Tariff) Regulations, 2009 (hereinafter called as the RERC Tariff Regulations, 2009) provide for terms and conditions for determination of tariff for Biomass based power projects to be commissioned during the control period of FY 2009-10 to FY 2013-14, based on parameters outlined in part-VII of these Regulations. Commission, vide its notification dated 24.02.2014, has issued Seventh Amendment in the RERC Tariff Regulations 2009, which provides that for Biomass & Biogas power projects, control period for the said Regulations stands extended upto 31st March 2015. The said amendment also provides for determination of generic tariff for Biogas based power plants.
2. Commission, based on the benchmark Capital Cost and other performance parameters contained in the RERC Tariff Regulations, 2009 read with the said Seventh Amendment had prepared the draft order for the generic tariff for the Biomass and Biogas based power

plants getting commissioned during FY 2014-15 and the same was issued for inviting comments/suggestions from the stakeholders.

- Public notices were issued in the following newspapers on the dates mentioned against each, inviting comments/suggestions from the stakeholders on the draft Order:

Dainik Bhaskar: 28.05.2014

The Times of India: 29.05.2014

Dainik Navjyoti: 28.05.2014

Public notices along with the draft order were also placed on the Commission's website.

- The last date for submission of comments/suggestions by the stakeholders/public was 18.06.2014.
- Hearing on the draft order was held on 3.07.2014. The stakeholders who offered their suggestions/comments are mentioned at Annexure-IV.
- Commission has considered the comments/suggestions received from the stakeholders through their written submissions as well as submissions made during the hearing along with relevant record placed before it. The present regulatory exercise is limited to determination of generic tariff for the Biomass and Biogas power plants getting commissioned during FY 2014-15 based on the parameters contained in the RERC Tariff Regulations, 2009 and amendments thereto. The comments/suggestions of the stakeholders received on parameters such as capital cost, depreciation, GCV of Biomass, O&M Expenses, Plant Load Factor (PLF), Auxiliary Consumption, components of working capital - maintenance spares and receivables for debtors have been considered as per the RERC Tariff Regulations, 2009.

7. Stakeholders have also raised several issues related to the Biomass power plants commissioned during the period FY 2009-10 to FY 2013-14. It was also requested that some sort of promotional and revival measures for the plants set up under 2009-14 regulations may also be taken by the Commission so that plants become viable. They have raised issues such as Biomass price, Biomass storage and handling cost, GCV of Biomass, AD Benefit, application of current MAT rate to calculate RoE, Rate of interest, considering repayment of instalment of loan equal to rate of depreciation, O&M expenses. The above issues have been considered. However, they are beyond the scope of the present proceedings as tariff determined in this order is based on the Regulations which are in force. Therefore, Commission proceeds to determine the tariff in terms of the parameters provided in the Tariff Regulations of 2009 as amended from time to time.
8. The summary of the comments and views expressed by the stakeholders is placed as Annexure-V.
9. The comments/ suggestions have been broadly grouped and summarized as under:
 - (1) MAT/Tax Rate;
 - (2) Difference in variable charges;
 - (3) Discount Rate;
 - (4) Accelerated Depreciation benefit for Biogas power plants;
 - (5) Biomass storage and handling cost; and
 - (6) Calculation Sheets;
10. The above issues and Commission's analysis/decision thereon have been dealt in the following paras:

(1) MAT/Tax Rate

11. Commission in the draft order for the purpose of grossing up the base rate of return on equity provided under regulation 21(5) of RERC Tariff Regulations 2009, has considered the MAT rate of 20.01% (= 18.50% MAT rate+5% surcharge + 3% cess) for first year and a MAT rate of 19.06% (= 18.5% MAT rate + 3% cess) for remaining 9 years of the first 10 years. For remaining 15 years of plant life (also equal to useful life), the normal tax rate of 30.90% (= 30% tax rate + 3% cess) has been applied for grossing up of the base rate of Return on Equity. Similarly, for determination of levellised benefit of higher depreciation also commission has considered tax rate of 32.45% (=30% tax rate+5% surcharge+3% cess) for the first year and 30.90%(= 30% tax rate+ 3% cess) for subsequent years.

12. Stakeholders have submitted that the abolition of surcharge has not yet materialized and not considering surcharge on Income Tax/ MAT for second and subsequent years does not appear logical and is also not as per the regulation 21(4)&(5) at RERC Tariff Regulations, 2009.

Commission's views/decision

13. As regards suggestions relating to consideration of surcharge in MAT/Income Tax for entire useful life of the projects, it is stated that Commission on 16.07.2009 had determined levellised tariff, based on the methodology of considering surcharge for the first year only for wind power plants commissioned during FY 2009-10. Thereafter, applying the indexation mechanism stipulated at regulation 85 of the RERC Tariff Regulations 2009, Commission determined the tariff for FY 2010-11 on 31.03.2010. M/s Indian Wind Power Association & M/s Enercon (India) Limited filed petition No. RERC-220,221/10 under removal of difficulties in the tariff regulations and to review the order dated 31.03.2010 regarding wind power plants as regards applicability of surcharge. This was disposed of by the Commission vide order dated

06.08.2010 without modifying the earlier tariff determined on account of change in surcharge on MAT. This Order was challenged before the APTEL, where, among other things, the issue of surcharge on MAT was raised before the Hon'ble APTEL in the matter of *M/s Enercon (India) Limited and Indian Wind Power Association (Rajasthan State Council) vs. Rajasthan Electricity Regulatory Commission, Jaipur and Ors. reported in 2011 ELR (APTEL) 0987*. The specific issue raised before the Hon'ble APTEL was that the Commission has committed error in not taking into account the surcharge on MAT for 2nd to 10th year and on income tax for eleventh to 20th year. Similarly, it was also argued that the impact of effective rate of corporate tax on calculating accelerated depreciation benefit was to be considered with surcharge and cess from first year to twentieth year. Hon'ble APTEL was of the view that *"if surcharge on MAT is to be allowed for 2nd to 20th Year in the case of the Appellant then the project developers who commissioned wind power plants in FY 2009-10 will be discriminated against. Since the levelised Tariff is not subject to true up and the amount of surcharge varies from year to year, noticeably by decrease, it is not possible for the Commission to consider surcharge of MAT from 2nd to 20th year"*. Commission considered it appropriate that no change is required as far as levy of surcharge is concerned. Accordingly, in the Order issued on 16.07.2014 for wind power plants getting commissioned during 2014-15, Commission has considered surcharge only for the first year. On the same ground, Commission is of the view that same methodology needs to be adopted in the present order for tariff determination of Biomass and Biogas power plants.

(2) Difference in variable charges

14. Stakeholders requested that variable cost for new plants to be commissioned in 2014-15 has been notified as ₹ 3.76 per unit and for old plants set up under regulation 2009-14 as ₹ 3.71 per unit. The variable cost for all plants for the year 2014-15 (same year) cannot be different. Commission may make the variable cost for the year same

for both old and new plants irrespective of the year in which these were established.

Commission's views/decision

15. Commission as per regulation 83 (7)(v) of the RERC Tariff Regulations, 2009 have specified a Biomass fuel price of Rs. 2450/MT for FY 2014-15 for power plants commissioned during the control period (2009-15). However, at regulation 84(1) of the RERC Tariff Regulations, 2009, the manner of determination of variable charges has been specified, from which it is observed that variable charges, in addition to fuel price, are also dependent on SHR and Auxiliary Consumption. As per regulation 83(7)(b) of the RERC Tariff Regulations, 2009, for the newly commissioned Biomass power plants, for first year, SHR and auxiliary consumption are higher than the Biomass plants commissioned earlier on account of stabilisation period. Therefore, for the same fuel price, variable charges work out different and no change is required on this account.

(3) Discount Rate

16. As per the regulation per 9(2) of RERC RE Tariff Regulations, 2014, for the purpose of levellised tariff computation, the latest available discount factor notified by CERC for the purpose of bid evaluation and payment at the time of issuance of the tariff order for the relevant year shall be considered. Some of stakeholders submitted that regulation 83(7) note (ii) of RERC Tariff Regulations, 2009 does not provide for discount rate. Commission has adopted discount rate of 13.10% as per CERC Order dated 7.10.13 which was valid for bid opening upto 31.03.2014. CERC vide their order dated 21.02.2014 on Petition no. 002/SM/2014, has decided to discontinue the notification of escalation rates for evaluation of bids with effect from 1.04.2014. CERC in their latest Notification No. Eco-1/2014-CERC dated 7.04.2014, has not notified discount rate for evaluation of bids. There is no discount rate which is notified by CERC and valid at present. Commission has vide order No

16 dated 31.12.2012 in respect of Biomass based power plants during FY 2012-13 has adopted rate equal to cost of capital as 14.02%, therefore, it would, be relevant to review discount rate based on cost of capital.

Commission's views/decision

17. Commission in the draft tariff order has adopted discounting rate of 13.10% in line with the approach followed by the Commission for determination of tariff for Biomass power plants for the year 2013-14 vide order dated 8.10.2013. The discounting rate of 13.10 % notified by CERC vide their notification dated 7.10.2013 was valid upto 31.03.2014 i.e. immediately before the commencement of the FY 2014-15. The tariff determined through this order would be applicable for entire FY 2014-15. In view of the above, Commission has considered a discount rate of 13.10% for determination of generic tariff for the Biomass and Biogas power plants getting commissioned during FY 2014-15 and suggestion of the stakeholder in this regard for plant getting commissioned during FY 2014-15 is not accepted. However, for generic tariff for plants which would be getting commissioned during the subsequent years of the present control period, a view would be taken separately.

(4) Accelerated Depreciation benefit for Biogas power plants:

18. In the working sheet for accelerated depreciation for Biogas power plants for FY 2014-15, gross capital cost of ₹ 1153 Lakh/MW has been considered.
19. Stakeholders have submitted that Section 43(1) of Income Tax Act provides for the calculation of depreciation on the net cost i.e. ₹ 853 Lakh/MW. Therefore, above may be revisited so that undue cost of Biogas power plants doesn't get passed on to the consumers.

Commission's views/decision

20. Commission has revisited the computation sheet for levelled benefit of Accelerated Depreciation. The Section 43(1) of the Income Tax Act reads as under:-

“Section 43 – Definitions of certain terms relevant to income from profits and gains of business or profession:

In sections 28 to 41 and in this section, unless the context otherwise requires –

(1)“ actual cost” means the actual cost of the assets to the assessee, reduced by that portion of the cost thereof, if any, as has been met directly or indirectly by any other person or authority.....”

21. In view of the above, Commission agrees with suggestion of the stakeholder and accordingly, the computation sheet for accelerated depreciation for Biogas power plants has been revised by considering net capital cost of ₹ 853 Lakh/MW, in place of ₹ 1153 Lakh/MW considered in the draft Order.

(5) Biomass storage and handling cost:

22. In the draft order, in computations of variable charges Commission has considered storage and handling losses of 2% in the draft order. Stake holder has submitted that Biomass is a peculiar fuel which is required to be procured in 3-4 months in harvesting season and stored and used for the rest of the year, also, the dozer expenses have increased from ₹ 379/MT to ₹ 591/MT on Biomass requirement of 8900 MT/MW/ year. This entails considerable cost for storage and handling which have not been covered in the O&M Expenses, so the same may be considered for determining variable charges for Biomass power plants commissioned during 2009-14.

Commission's views/decision

23. Commission in its Order dated 17.08.2009, taking note that losses take place in procurement, transportation, handling and storage of Biomass fuel and further observed that the production of mustard crop leading to availability of mustard husk follows annual cycle and therefore, storage is required for much longer period than that of lignite and coal. The longer storage adds to the losses. In view of the above, Commission had allowed the storage and handling losses of 2%. Further, Commission has been consistently allowing these losses in the variable charges in the tariff orders issued in respect of the Biomass power plants commissioned during FY 2009-14 and also plants, getting commissioned during FY 2014-15 in the draft order circulated. In light of above, Commission considers the cost proposed are adequate and does not require any modification in this order.

(6) Calculation Sheets

24. In the tariff computation sheets, Commission considered income tax rate of 30.90% for 11th year onwards whereas in the computation of levelled benefit of accelerated depreciation, Commission has considered rate of 32.45% for the first year and 30.90% for 11th year onwards.
25. One of the stakeholders has pointed out that in the calculation of HD benefit, income tax rate considered is 32.45% as per the note 3 for the first year whereas in item no. 4 of financial assumptions, it is mentioned as 30.90%. It has been further submitted that in the table for higher depreciation benefit, the depreciation allowed during the year, it is shown as 50% but in note no. 1 of the same sheet, it is mentioned as 40% i.e. 50% of 80%.

Commission's views/decision

26. Commission has considered income tax rate of 30.90% for grossing up of the base rate of RoE from 11th year onwards whereas in the calculations of levelled benefit of accelerated depreciation, income tax rate of 32.45% has been considered for the first year and income tax rate of 30.90% for subsequent years. Further, in the computation sheet of Accelerated depreciation, the depreciation has been considered as 50% (=50% of (80%+20%)). In light of Commission's views expressed in the earlier paras no change is required. However, further clarity has been provided in the financial assumption sheet and computation sheet of levelled benefit of accelerated depreciation.

(7) Depreciation rate for accelerated depreciation benefit

27. In the computation of levelled benefit of accelerated depreciation in the draft order, Commission has adopted the methodology of considering book depreciation at the uniform rate of 5.28% of capital cost till 90% of capital cost with 10% salvage value. Commission observes that as per Schedule-II of the Companies Act, 2013, the Companies, where useful lives or residual value are prescribed by a regulatory authority constituted under an act of the Parliament or by the Central Government, shall use depreciation rates or useful lives and residual values prescribed by the relevant Regulatory Authority. Commission observes that in the case of Biomass and Biogas power plants, regulation 83(7)(ix) of the RERC Tariff Regulations, 2009 specifies that depreciation would be as per regulation 23 and Appendix-I to the RERC Tariff Regulations, 2009. The relevant regulation 23 (4) of the RERC Tariff Regulations, 2009 reads as under :

“(4) Depreciation shall be calculated annually based on Straight Line Method (SLM) and at rates specified in Appendix-I to these regulations for the assets of the generating station, transmission system and distribution system:

Provided that, the remaining depreciable value as on 31st March of the year closing after a period of 12 years from date

of commercial operation shall be spread over the balance useful life of the assets. “

The Appendix-I to the said regulations further provides for a depreciation rate of 5.28% of the total project cost for RE projects for which generic tariff is determined. In view of the above, Commission considers it appropriate that in the computations of levelled accelerated depreciation benefit, depreciation rate as per regulations may be taken i.e. 5.28% of total project cost for 12 years and the remaining depreciation spread over the remaining useful life of the project from the 13th year onwards, instead of book depreciation of 5.28% considered in the draft order for both Biomass and Biogas power plants.

(8) Tariff levellisation

28. In the draft tariff order, for the computation of the levelled fixed cost, the year wise calculated fixed cost has been discounted. However, stakeholders in the matter of determination of levelled tariff of wind power plants for FY 2014-15 raised the issue that levelled tariff is a uniform tariff which gives revenue stream whose NPV (Net Present Value) shall be the same as the NPV of revenue stream of year wise calculated tariff. Commission agreeing to the suggestion of the stakeholders in the matter of determination of tariff for wind power plants for FY 2014-15, worked out the levelled tariff by discounting the revenue stream and generation separately with the NPV of the revenue stream with levelled tariff is same as the NPV of revenue stream of year wise calculated tariff stream. On the same analogy, in case of Biomass power plants also, the levelled fixed component has been worked out i.e. by discounting the revenue stream with levelled fixed cost and generation separately such that NPV of the revenue stream with levelled fixed cost is same as the NPV of the revenue stream of year wise calculated fixed cost stream. Accordingly, the

levellised fixed cost has been revised. However, for Biogas power plants, the generation remains same for the useful life i.e. PLF 85% and therefore, the levellised fixed cost for them would remain unchanged.

The proposed levellised generic tariff for Biomass and Biogas based power plants getting commissioned FY 2014-15:

29. The levellised generic tariff for Biomass and Biogas based power plants, getting commissioned during FY 2014-15, has been worked out based on operational and performance parameters as specified under Regulations 83(7) and 83(8) of the RERC Tariff Regulations, 2009 and the financial principles as stipulated under Part III of the said Regulations read with Seventh Amendment notified on dated 24.02.2014. The parameters adopted in this draft order have been discussed in the following paras:

Useful Life

30. Clause (h) and (i) of sub regulation (71) of regulation 2 of the RERC Tariff Regulations 2009 defines 'useful life' for both Biomass and Biogas power plants as 20 years. Accordingly, useful life has been considered as 20 years, for both Biomass and Biogas based power plants, for determination of their respective generic levellised tariff.

Capital Cost

31. Regulation 83(7)(b) of the RERC Tariff Regulations 2009 read with Seventh Amendment provides for normative capital cost for biomass based power plants employing water cooled and air cooled condensers for FY 2014-15 as ₹ 526 Lakh/MW and ₹ 561 Lakh/MW respectively. The said normative capital costs include ₹ 15 Lakh/MW towards transmission system and ₹ 2 Lakh/MW as connectivity charges payable to the STU.

32. Similarly, regulation 83(8) of the RERC Tariff Regulations 2009 read with Seventh Amendment provides for the normative capital cost for Biogas power plants as ₹ 1153 Lakh/MW for the FY 2014-15 and after taking into account of capital subsidy of ₹ 300 Lakh/MW, net capital cost has been specified as ₹ 853 Lakh/MW. This capital cost also includes transmission system cost upto the interconnection point and connectivity charges of ₹ 2 Lakh/MW payable to the STU.
33. The Capital Costs considered in respect of Biomass and Biogas based power plant for determination of generic tariff, are summarized as under:

Table-1: Capital Cost for Biomass and Biogas based power plants for FY 2014-15

| S. No. | Renewable Energy Project | Capital Cost Norm for FY 2014-15 (₹ Lakh/MW) |
|--------|----------------------------|----------------------------------------------|
| 1. | Biomass Power Plants | |
| | (1) Water Cooled Condenser | 526 |
| | (2) Air Cooled Condenser | 561 |
| 2. | Biogas Based Power Plants | 853 |

Debt-Equity Ratio

34. The Debt-Equity ratio of 70:30, as envisaged at regulation 17 of RERC Tariff Regulations 2009, has been taken for working out the debt and equity components of normative capital cost for determination of levellised fixed component of the tariff for both Biomass and Biogas power plants.

Return on Equity

35. Regulation 21 of the RERC Tariff Regulations 2009 provides for a rate of Return on Equity as 16% on the equity base of 30% determined in accordance with regulation 17 of said Regulations. As per regulation 21, Return on Equity has been computed by grossing up the base rate

of 16% with tax rate equivalent to Minimum Alternate Tax (MAT) for first 10 years from COD and normal tax rate for remaining years of the project life. In line with the practice followed during the previous control period, the MAT rate of 20.01% (= 18.50% MAT rate+5% surcharge + 3% education cess) has been considered for first year and a MAT rate of 19.06% (= 18.5% MAT rate + 3% education cess) has been considered for remaining 9 years of the first 10 years. For remaining 10 years of project life (also equal to useful life), the normal tax rate of 30.90% (= 30% tax rate + 3% education cess) has been applied for grossing up of the base rate of Return on Equity.

Operation & Maintenance (O&M) Expenses

36. Regulation 83(7)(b)(vii) of the RERC Tariff Regulations, 2009 stipulates normative O&M expenses for FY 2014-15 for Biomass based power plants in terms of percentage of Capital cost for power plant as 6.50% and O&M expenses for transmission line as 3.0% of cost of transmission line.
37. Regulation 83(8)(vi) of the RERC Tariff Regulations 2009, stipulates the normative O&M expenses for Biogas power plants for FY 2014-15 as ₹ 44.71 Lakh/MW.
38. Further, as per regulation 25(4) of the RERC Tariff Regulations 2009, the specified O&M expenses for FY 2014-15, for both Biomass and Biogas power plants, shall be escalated by 5.72% per annum over their respective tariff period for determination of their levellised fixed cost component of generic tariff.
39. Accordingly, the normative O&M expenses considered for computation of generic levellised fixed component of tariff for FY 2014-15 are as under:

Table-2: Normative O&M Expenses for FY 2014-15 for Biomass and Biogas based power plants

| S. No. | Renewable Energy Project | O&M Expenses for FY 2014-15 |
|--------|---------------------------------|---------------------------------------------------|
| 1. | Biomass Power Plants | |
| | (1) With Water Cooled Condenser | ₹ 33.22 Lakh/MW (= 6.5% of (₹ 511 Lakh/MW=526-15) |
| | Transmission System | ₹0.45 Lakh/MW (= 3% of ₹15 Lakh/MW) |
| | (2) With Air Cooled Condenser | ₹ 35.49 Lakh/MW (= 6.5% of ₹ 546 Lakh/MW (561-15) |
| | Transmission System | ₹0.45 Lakh/MW (= 3% of ₹15 Lakh/MW) |
| 2. | Biogas Power Plants | ₹ 44.71 Lakh/MW |

Interest rate on long term loan and Interest on working capital requirement

40. Regulation 83(7)(b)(xi) of RERC Tariff Regulations 2009 specifies the interest rate on long term loans for Biomass based power plants as 300 basis points higher than the average SBI base rate prevalent during first six months of previous year.
41. Accordingly, the average SBI base rate prevalent during first six months of the FY 2013-14 has been considered for computation of applicable interest rate , as shown in the table below:

Table-3: Average SBI base rate during first six months of FY 2013-14

| Period from | Period to | Base rate | No. of days |
|--------------------------------------|------------|-----------|-------------|
| 1.04.2013 | 18.09.2013 | 9.70% | 171 |
| 19.09.2013 | 30.09.2013 | 9.80% | 12 |
| Average SBI Base rate for FY 2013-14 | | 9.71% | 183 |

(Source:<http://in.reuters.com/article/2013/11/29/india-int-base-idINL4N0JE2ES20131129>)

42. In terms of the above, the interest rate of 12.71% (=9.71%+3.00%) has been used for computation of interest on long term loan in generic tariff computations, treating loan as 70% of the capital cost.
43. Further, the repayment of loan has been taken equal to the depreciation allowed for that year as stipulated at regulation 22(3) of RERC Tariff Regulations 2009.

44. For the purpose of working capital requirement for Biomass based power plants, the composition of working capital has been taken as per regulation 83(7)(b)(x) of the RERC Tariff Regulations 2009.
45. Regulation 83(7)(b)(x) of the RERC Tariff Regulations 2009, specifies the interest rate on working capital for Biomass based plants as 250 basis points higher than the average SBI base rate prevalent during first six months of previous year, which works out to be 12.21% (=9.71%+2.50%). Accordingly, a rate of 12.21% has been taken as interest rate on working capital requirement.
46. As per the regulation 83(8) inserted vide Seventh Amendment in RERC Tariff Regulations, 2009 for the purpose of generic tariff determination for Biogas power plants, the financial principles and other principles, as applicable to Biomass power plants, shall also be applicable for Biogas power plants except the parameters such as capital cost, Plant Load Factor, Feed Stock Cost and O&M Expenses, which have been expressly provided therein. Therefore, the financial parameters, which also include interest on long term loan and interest on Working Capital requirement for Biomass based power plants, would also apply to Biogas power plants. Accordingly, interest rate on long term loan and working capital requirement for Biogas power plants have been taken same as also specified for Biomass based power plants.
47. It is further mentioned that for working out the receivables, which is one of the components of the composition of the working capital requirement for Biomass power plants, an annual escalation of 5% in the Biomass fuel price has been assumed. Similarly, for Biogas power plants also, an escalation of 5%, as considered by CERC, has been taken for working out the composition of working capital requirement.

Depreciation

48. In accordance with regulation 83(7)(b)(ix) of the RERC Tariff Regulations, 2009, the rate of the depreciation has been considered as 5.28% of the total project cost for the first 12 years and remaining depreciable value has been spread over the balance useful life of the power project and transmission system, as the case may be.

Plant Load Factor

49. As per regulation 83(7)(b)(iv) of the RERC Tariff Regulations 2009, the plant load factor (PLF) for Biomass based power plants, has been considered as 60% during stabilisation, 70% during first year after stabilisation and 75% from second year onwards in the tariff computations.

50. Similarly, in line with regulation 83(8)(iv) of the RERC Tariff Regulations 2009 inserted vide Seventh Amendment, the PLF for Biogas power plants has been considered as 85% for generic tariff computations.

Auxiliary Consumption Factor

51. Regulation 83(7)(b) of the RERC Tariff Regulations 2009 provides for the auxiliary consumption factor for Biomass based power plants as under:

Table-4: Auxiliary Consumption Factor for FY 14-15

| <i>Particulars</i> | <i>Water cooled condenser</i> | <i>Air cooled condenser</i> |
|-------------------------------------|-----------------------------------------|-----------------------------------------|
| <i>Auxiliary Consumption Factor</i> | 10.50% <i>(during stabilisation)</i> | 12.50% <i>(during stabilisation)</i> |
| | 10% <i>(after stabilisation)</i> | 12% <i>(after stabilisation)</i> |

Accordingly, the auxiliary consumption factor has been taken in tariff computations for Biomass based power plants.

52. For Biogas power plants, as stipulated at regulation 83(8) (iii) of the RERC Tariff Regulations 2009, an auxiliary consumption factor of 12% has been considered in generic tariff computations.

Station Heat Rate

53. In accordance to regulation 83(7)(b) of the RERC Tariff Regulations 2009, the Station Heat Rate (SHR) for Biomass based power plants has been taken as under:

Table-5: Station Heat Rate for FY 2014-15

| <i>Particulars</i> | <i>Water cooled condenser</i> | <i>Air cooled condenser</i> |
|--------------------------|-------------------------------------------------|-------------------------------------------------|
| <i>Station Heat Rate</i> | <i>4300 kCal/kWh (during stabilisation)</i> | <i>4540 kCal/kWh (during stabilisation)</i> |
| | <i>4200 kCal/kWh (after stabilisation)</i> | <i>4440 kCal/kWh (after stabilisation)</i> |

Gross Calorific Value

54. As stipulated at regulation 83(7)(b)(vi) of the RERC Tariff Regulations 2009, the Gross Calorific Value has been taken as 3400 kCal/kg for Biomass based power plants.

Specific Fuel Consumption

55. Regulation 83(8)(ii) of the RERC Tariff Regulations 2009 provides for specific fuel consumption of 3 kg/kWh for Biogas based power plants. Accordingly, a specific fuel consumption of 3 kg/kWh for Biogas power has been considered for computation of generic levelled tariff for FY 2014-15.

Fuel Cost and Feed Stock Cost

56. In accordance with regulation 83 (7)(b)(v) of the RERC Tariff Regulations,2009, the biomass fuel price has been considered as ₹ 2450 /MT for Biomass power plants getting commissioned during FY 2014-15 and the variable component of tariff has been worked out in accordance with regulation 84(1) the said Regulations. This fuel price

shall be subject to revision prospectively during the course of year and thus, variable component would also be revised accordingly.

57. For Biogas power plants getting commissioned during FY 2014-15, as stipulated at regulation 83(8)(v) of the RERC Tariff Regulations 2009, a feed stock price of ₹ 1175/MT (net of any cost recovery from digester effluent) has been considered. Further, as specified at regulation 83(8)(v) of the RERC Tariff Regulations 2009, the substrate price escalation factor has been considered as 5%, as per CERC, for remaining years of useful life. Accordingly, the variable component of tariff for Biogas power plant has been worked out as per provision of regulation 84(2) of the RERC Tariff Regulations 2009.
58. While calculating the total applicable tariff for a Biomass and Biogas power plant, levellisation of the fixed component has been done for a period equivalent to its useful life i.e. 20 years.

Subsidy or incentive by the Central Government, including Accelerated Depreciation (AD) benefit

59. The Generation Based Incentive/Tariff Subsidy, if any, allowed by the Central/ State Govt. would be governed by the terms and conditions of such scheme.
60. As regards impact of accelerated depreciation admissible to Biomass and Biogas based power projects, in addition to allowed 80% depreciation, an additional depreciation of 20% permitted to the new assets acquired by power generating companies in the initial year vide amendment in Section 32, sub-section(1) clause (iia) of the Income Tax Act, 1961 has also been taken into account.

61. Accordingly, considering the capital cost of the Biomass and Biogas based projects, getting commissioned during FY 2014-15, as capitalized during second half of the year (i.e. put to use for less than 180 days), and an additional depreciation of 10% has been taken in the first year and balance 10% additional depreciation has been taken in the subsequent year.
62. In the generic tariff computations of this draft order in respect of incidence of depreciation, the capitalization has been taken during the second half of the first year and the energy available in the second half of the year has been taken as 50% of annual generation, which is also in consonance with the methodology followed by CERC for working out the benefit of accelerated depreciation.
63. For the purpose of determining accelerated depreciation benefit, as dealt earlier, the depreciation rate as per the regulations (i.e. 5.28% for 12 years and 3.33% for the remaining useful life) (as also allowed under the Companies Act, 2013) has been compared with the depreciation rate as per Income Tax Act i.e. 80% of the written down value. The computation has been given at Annexure-I, Annexure-II and Annexure-III.

Tariff period and Levellised Tariff

64. The fixed cost has been levellised for 20 years and applicable tariff has been determined for the useful life of the Biomass and Biogas based power projects i.e. for 20 years considering both the situations viz. if accelerated depreciation benefit is availed and if not availed. Considering the said position, the PPA would also have to be for a period of 20 years.

65. In light of the above, the levellised generic tariff for Biomass based power plants getting commissioned during for FY 2014-15 is determined as under:

Table-6: Tariff for Biomass based power plants getting commissioned during FY 14-15

| Year | Water cooled condenser Fixed Charges (levellised for 20 years) | | | Air-cooled condenser Fixed Charges (levellised for 20 years) | | |
|---------|-------------------------------------------------------------------|--------------------------------------|----------------------------------|-----------------------------------------------------------------|--------------------------------------|----------------------------------|
| | (i) Without availing AD benefit: ₹ 2.62/kWh | | | (i) Without availing AD benefit: ₹2.86/kWh | | |
| | (ii) With AD benefit availed: ₹ 2.41/kWh | | | (ii) With AD benefit availed: ₹ 2.63/kWh | | |
| | Variable Charges (Rs/kWh) | Applicable Tariff (Rs/kWh) | | Variable Charges (Rs/kWh) | Applicable Tariff (Rs/kWh) | |
| | | Without availing AD benefit (Rs/kWh) | With AD benefit availed (Rs/kWh) | | Without availing AD benefit (Rs/kWh) | With AD benefit availed (Rs/kWh) |
| 2014-15 | 3.48 | 6.10 | 5.89 | 3.76 | 6.62 | 6.39 |

66. Similarly, the levellised generic tariff for Biogas power plants getting commissioned during for FY 2014-15 is determined as under:

Table-7: Tariff for Biogas based power plants getting commissioned during FY 14-15

| FY | Fixed Charges (levellised for 20 years) | | |
|---------|----------------------------------------------------|-------------------------------------|----------------------------------|
| | (i) Without availing AD benefit: ₹ 3.47/kWh | | |
| | (ii) With AD benefit availed : ₹ 3.16/kWh | | |
| | Variable Charges (₹/kWh) | Applicable Tariff (Rs/kWh) | |
| | | Without availing AD benefit (₹/kWh) | With AD benefit availed (₹ /kWh) |
| 2014-15 | 4.01 | 7.48 | 7.17 |
| 2015-16 | 4.21 | 7.68 | 7.37 |
| 2016-17 | 4.42 escalating 5% p.a. upto 20 th year | 7.89 | 7.58 |
| 2017-18 | So on... | | |

67. Both the tariff mentioned in the above table(s) i.e., with or without availing accelerated depreciation (AD) benefit, are valid tariff for Biomass and Biogas power purchase by distribution licensees from the plants covered under this tariff order.

68. For a Biomass and Biogas based power plant(s) claiming the higher tariff worked out as above for projects not availing accelerated depreciation benefit, Commission considers it appropriate to lay down modalities as under:

- (1) The PPA should include an undertaking of the Biomass or Biogas power generator that accelerated depreciation benefit would not be availed for the generating plant/unit.
- (2) The first bill raised by the Biomass or Biogas power generator shall be accompanied by an undertaking that accelerated depreciation benefit shall not be claimed. Based on this, the applicable tariff would be allowed.
- (3) The claims of energy charges as per applicable tariff may be entertained based on the said undertaking upto the due date of filing of Income Tax Return of the relevant financial year. This would mean 30th September, 2014 for payment for the financial year 13-14 and for the first six months (upto 30th September) of financial year 14-15 and so on.
- (4) After filing of Income Tax Return a certificate from a Chartered Accountant (CA) that accelerated depreciation has not been claimed would have to be submitted or in the alternative a copy of Income Tax Return filed with Income Tax Department wherein accelerated depreciation has not been claimed along with verification of Tax Consultant may be furnished.
- (5) As Income Tax Return is required to be filed in the next year, the payment of amount corresponding to non-availment of accelerated depreciation in respect of energy supplied in the month of October onwards of the financial year following the financial year of commissioning of the plant would be made only after the said certificate/copy of Income Tax Return is furnished.
- (6) For the energy supplied in the months of October onwards, the methodology as given in sub-paras (4) & (5) above be followed.

69. Commission also considers it appropriate that undertaking of the Biomass and Biogas power generator in PPA saying that benefit of accelerated depreciation would not be claimed should also include an undertaking that in case it is found that benefit of higher depreciation has been claimed, the distribution licensee shall be entitled to recover the amount wrongly claimed by power generator along with penal charges @ 1.50% per month calculated on daily basis.
70. A Biomass or Biogas power generator not availing CDM benefit would need to give an annual undertaking that CDM benefit has not been availed. However, if CDM benefit is availed, it would have to be shared with distribution licensee as envisaged in applicable Regulations.
71. For supply of energy to distribution licensee under this tariff order, the metering would be at generator premises as provided in the note (iii) appearing below the sub-regulation 7(b)(xi) of regulation 83 inserted vide said Seventh Amendment.

Variable Charges for Biomass power plants commissioned during FY 2009-14

72. As per the provisions of the regulation 83(7)(b)(v) of the RERC Tariff Regulations 2009, the Biomass fuel price of ₹ 2450/MT (for FY 2014-15) is also applicable in case of Biomass power plants commissioned during the period 2009-14 after coming into effect of seventh amendment. The variable component of the Tariff has, therefore, been reworked out for FY 2014-15 for such Biomass power plants already commissioned during the year 2009-2014. This fuel price of ₹ 2450/MT shall be subject to revision prospectively and the variable components for such plants would also be revised accordingly.

73. The variable charges for Biomass power projects commissioned earlier during the period i.e. FY 2009-14, based on the fuel price of ₹ 2450/MT, shall be ₹ 3.43/kWh and ₹ 3.71/kWh for water cooled and air cooled condensers respectively with fixed charges remaining the same as determined earlier through the respective tariff order(s) for the Biomass based power plants commissioned in the relevant year with other terms and conditions stipulated therein being remaining applicable.
74. Commission in exercise of its power conferred under Section 62 read with Section 64 of the Electricity Act, 2003 and the RERC Tariff Regulations, 2009 determines the tariff for Biomass and Biogas power plants as detailed in Annexure – I, II and III.
75. The above tariff is applicable for the Biomass and Biogas power plants commissioned on or after 01.04.2014 and shall be in force till 31.03.2015.
76. Copy of this Order may be sent to the State Government, Central Electricity Authority (CEA), Rajasthan Renewable Energy Corporation Limited (RREC), Distribution Licensees and all stakeholders.

(Vinod Pandya)
Member

(S. Dhawan)
Member

(Vishvanath Hiremath)
Chairman

TARIFF DETERMINATION FOR BIOMASS POWER PLANT WITH WATER COOLED CONDENSOR

Annex-I

FY 2014-15

| | |
|-------------|--------|
| Case Select | Option |
|-------------|--------|

1

| S. No. | Assumption Head | Sub-Head | Sub-Head (2) | Unit | Base Case |
|--------|--------------------------|-------------------------------------------------|----------------------------------------------------------------------------|-------------------|-----------|
| 1 | Power Generation | Capacity | Installed Power Generation Capacity | MW | 1 |
| | | | Auxiliary Consumption during stabilisation | % | 10.50% |
| | | | Auxillary Consumption after stabilisation | % | 10% |
| | | | PLF (Stablization for 6 months) | % | 60% |
| | | | PLF (during first year after Stablization) | % | 70% |
| | | | PLF (Second year onwards) | % | 75% |
| | | | Useful Life of Transmission system | Years | 35 |
| | | | Useful life of Power Plant | Years | 20 |
| 2 | Project Cost | Capital Cost/MW | including Power plant, Land, Transmission line cost & Connectivity charges | Rs Lakh/MW | 526 |
| | | Power plant Cost | Power Plant Cost including connectivity charge | Rs Lakh/MW | 511 |
| | | Tranmssion line Cost | | Rs Lakh/MW | 15 |
| 3 | Sources of Fund | Debt: Equity | Debt | % | 70% |
| | | | Equity | % | 30% |
| | | | Total Debt Amount | Rs Lakh | 368.20 |
| | | | Total Equity Amount | Rs Lakh | 157.80 |
| | | Debt Component | Loan Amount | Rs Lakh | 368.20 |
| | | | Intrest Rate | % | 12.71% |
| | | Equity Component | Equity amount | Rs Lakh | 157.80 |
| | | | Return on Equity | % p.a | 16.00% |
| | | Discount Rate (As per CERC Notification 7.10.1) | % | 13.10% | |
| 4 | Financial Assumptions | Fiscal Assumptions | Income Tax (for yr-11 to yr-20) | % | 30.90% |
| | | | MAT Rate (for yr-1)) | | 20.01% |
| | | | MAT Rate (for yr-2 to yr-10) | % | 19.06% |
| | | | 80 IA benefits | Yes/No | Yes |
| | | | Accelerated depreciation benefit | Yes/No | 0.21 |
| | | | Depreciation | Depreciation Rate | % |
| | | Years for 5.28% rate | | 12 | |
| 5 | Working Capital | For Fixed Charges | | Months | 1 |
| | | O&M Expenses | | | |
| | | Maintenance Spares | (% of O&M exepenses) | | 20% |
| | | Receivables for Debtors | | Months | 1.5 |
| | | For Variable Charges | | | |
| | | Biomass Stock | | Months | 4 |
| | | Intrest On Working Capital | | % | 12.21% |
| 6 | Fuel Related Assumptions | Heat Rate | After Stabilisation period | kCal/kWh | 4200 |
| | | | During Stablization Period | kCal/kWh | 4300 |
| | | Biomass | Biomass Price (FY14-15) | Rs/MT | 2450 |
| | | | GCV - Biomass | kCal/kg | 3400 |
| | | | Biomass Price Escalation Factor for working capital requirement | | 5% |
| | | | Handling and storage losses | % | 2% |
| 7 | Operation & Maintenance | power plant | % of base capital cost | % | 6.5% |
| | | Transmission lines | % of transmission line cost | % | 3.0% |
| | | Normative Total O & M Expenses Escalation rate | | % | 5.72% |
| | | Total No. of Hours | | hrs | 8760 |

TARIFF DETERMINATION FOR BIOMASS POWER PLANT WITH WATER COOLED CONDENSOR

1 0.884 0.782 0.691 0.611 0.540 0.478 0.422 0.374 0.330 0.292 0.258 0.228 0.202 0.178 0.158 0.140 0.123 0.109 0.096

For Biomass plants to be commissioned during 2014-15

Cost of Generation

| Particulars of Generation | Unit | Years---> | 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 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 |
| Auxiliary Consumption | MU | | 0.58 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 |
| Net Generation | MU | | 5.11 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 |

| Variable Cost | Unit | Years---> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|------------------------|----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Biomass Cost | Rs Lakhs | | 177.71 | 212.96 | 223.60 | 234.78 | 246.52 | 258.85 | 271.79 | 285.38 | 299.65 | 314.63 | 330.37 | 346.88 | 364.23 | 382.44 | 401.56 | 421.64 | 442.72 | 464.86 | 488.10 | 512.51 |
| Per unit Variable Cost | Rs/kWh | | 3.48 | 3.60 | 3.78 | 3.97 | 4.17 | 4.38 | 4.60 | 4.83 | 5.07 | 5.32 | 5.59 | 5.87 | 6.16 | 6.47 | 6.79 | 7.13 | 7.49 | 7.86 | 8.25 | 8.67 |

| Fixed Cost | Unit | Years---> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---------------------------------------------|----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| O&M Expenses | Rs Lakhs | | 33.67 | 35.59 | 37.63 | 39.78 | 42.05 | 44.46 | 47.00 | 49.69 | 52.53 | 55.54 | 58.72 | 62.07 | 65.62 | 69.38 | 73.35 | 77.54 | 81.98 | 86.67 | 91.62 | 96.86 |
| Depreciation | Rs Lakhs | | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 17.52 | 17.52 | 17.52 | 17.52 | 17.52 | 17.52 | 17.52 | 17.52 |
| Interest on term loan | Rs Lakhs | | 45.02 | 41.49 | 37.96 | 34.43 | 30.91 | 27.38 | 23.85 | 20.32 | 16.79 | 13.26 | 9.73 | 6.20 | 3.33 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Interest on working Capital | Rs Lakhs | | 13.42 | 15.46 | 16.11 | 16.80 | 17.53 | 18.29 | 19.10 | 19.96 | 20.86 | 21.81 | 22.89 | 23.94 | 24.90 | 26.09 | 27.36 | 28.72 | 30.14 | 31.63 | 33.21 | 34.86 |
| Return on Equity | Rs Lakhs | | 31.56 | 31.19 | 31.19 | 31.19 | 31.19 | 31.19 | 31.19 | 31.19 | 31.19 | 31.19 | 31.19 | 36.54 | 36.54 | 36.54 | 36.54 | 36.54 | 36.54 | 36.54 | 36.54 | 36.54 |
| Total Fixed Cost | Rs Lakhs | | 151.44 | 151.50 | 150.66 | 149.98 | 149.45 | 149.09 | 148.92 | 148.93 | 149.14 | 149.57 | 155.65 | 156.53 | 147.91 | 150.63 | 154.76 | 160.31 | 166.17 | 172.35 | 178.88 | 185.78 |
| Per unit Fixed Cost | Rs/kWh | | 2.96 | 2.56 | 2.55 | 2.54 | 2.53 | 2.52 | 2.52 | 2.52 | 2.52 | 2.53 | 2.63 | 2.65 | 2.50 | 2.55 | 2.62 | 2.71 | 2.81 | 2.91 | 3.03 | 3.14 |
| Per unit Fixed Cost considering accelerated | Rs/kWh | | 2.75 | 2.35 | 2.34 | 2.32 | 2.32 | 2.31 | 2.31 | 2.31 | 2.31 | 2.32 | 2.42 | 2.44 | 2.29 | 2.34 | 2.41 | 2.50 | 2.60 | 2.70 | 2.81 | 2.93 |

Levelised per unit fixed charges (Rs/kWh) 2.62
(Without Availing AD Benefit)

Levelised per unit fixed charges (Rs/kWh) 2.41
(With Availing AD Benefit)

Applicable Tariff for plants commissioned during FY 2014-15

| | | |
|--------------------------------|------|--------|
| Variable Cost (FY 2014-15) | 3.48 | Rs/kWh |
| Levelised Fixed Cost | 2.62 | Rs/kWh |
| Applicable Tariff (FY 2014-15) | 6.10 | Rs/kWh |
| Accelerated Depreciation | 0.21 | Rs/kWh |
| Net Tariff (FY 2013-14) | 5.89 | Rs/kWh |

Applicable Tariff for plants commissioned during FY 2009-2014

| | | |
|----------------------------|------|--------|
| Variable Cost (FY 2009-14) | 3.43 | Rs/kWh |
|----------------------------|------|--------|

TARIFF DETERMINATION FOR BIOMASS POWER PLANT WITH WATER COOLED CONDENSOR
Variable Cost 2014-15

| S. No. | Particulars | Unit | Stabilisation Period (First 6 Month) | Remain. 6 month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|--------|-------------------------|---------------|--------------------------------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 | 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 |
| 2 | Plant load factor | % | 60% | 70% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% |
| 3 | Gross energy generation | MU | 2.63 | 3.07 | 5.694 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 |
| 4 | Auxiliary Consumption | % | 10.5% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% |
| 5 | Auxiliary Consumption | MU | 0.28 | 0.31 | 0.58 | 0.657 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 |
| 6 | Net Energy generation | MU | 2.35 | 2.76 | 5.11 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 |
| 7 | Station Heat Rate | Kcal/kWh | 4300 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 | 4200 |
| 8 | Energy Input required | Million Kcal | 11300.4 | 12877.2 | 0.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 | 27594.0 |
| 9 | Calorific Value | Kcal/kg | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 |
| 10 | Biomass Required | Million Kg | 3.324 | 3.787 | 7.25 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 | 8.278 |
| 11 | Biomass Price | Rs/ MT | | | 2450 | 2573 | 2701 | 2836 | 2978 | 3127 | 3283 | 3447 | 3620 | 3801 | 3991 | 4190 | 4400 | 4620 | 4851 | 5093 | 5348 | 5615 | 5896 | 6191 |
| 12 | Biomass Cost | Rs Lakh | | | 177.7 | 213.0 | 223.6 | 234.8 | 246.5 | 258.9 | 271.8 | 285.4 | 299.7 | 314.6 | 330.4 | 346.9 | 364.2 | 382.4 | 401.6 | 421.6 | 442.7 | 464.9 | 488.1 | 512.5 |
| 13 | Variable Cost | Rs/kWh | | | 3.48 | 3.60 | 3.78 | 3.97 | 4.17 | 4.38 | 4.60 | 4.83 | 5.07 | 5.32 | 5.59 | 5.87 | 6.16 | 6.47 | 6.79 | 7.13 | 7.49 | 7.86 | 8.25 | 8.67 |

TARIFF DETERMINATION FOR BIOMASS POWER PLANT WITH WATER COOLED CONDENSOR
Variable Cost 2009-14

| S. No. | Particulars | Unit | Variable Charges |
|---------------|-------------------------|---------------|-------------------------|
| 1 | Installed Capacity | MW | 1 |
| 2 | Plant load factor | % | 75% |
| 3 | Gross energy generation | MU | 6.57 |
| 4 | Auxiliary Consumption | % | 10.0% |
| 5 | Auxiliary Consumption | MU | 0.66 |
| 6 | Net Energy generation | MU | 5.91 |
| 7 | Station Heat Rate | kCal/kWh | 4200 |
| 8 | Energy Input required | Million Kcal | 27594.0 |
| 9 | Calorific Value | kCal/kg | 3400 |
| 10 | Biomass Required | Million Kg | 8.278 |
| 11 | Biomass Price | Rs/MT | 2450 |
| 12 | Biomass Cost | Rs Lakh | 202.8 |
| 13 | Variable Cost | Rs/kWh | 3.43 |

TARIFF DETERMINATION FOR BIOMASS POWER PLANT WITH WATER COOLED CONDENSOR

Determination of Accelerated Depreciation Benefit for Biomass Power Projects

Annex-I Contd..

| | | |
|------------------------------|--------|-----------------------|
| Depreciation amount | 90% | |
| Depreciation rate | 5.28% | |
| Tax Depreciation rate | 80% | |
| Additional depreciation rate | 20% | |
| Income Tax | 32.45% | 30.90% (yr-2 onwards) |
| Capital Cost | 526.00 | Rs Lakh/MW |

| Year(s)--> | Unit | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|------------------------------------|----------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 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% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% |
| Depreciation | Rs Lacs | 13.89 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 27.77 | 17.52 | 17.52 | 17.52 | 17.52 | 17.52 | 17.52 | 17.52 | 17.52 |
| Higher Depreciation Benefit | | | | | | | | | | | | | | | | | | | | | |
| Opening balance | % | 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 | % | 50.00% | 45.00% | 4.00% | 0.80% | 0.16% | 0.03% | 0.01% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 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% |
| Higher depreciation | Rs Lacs | 263.00 | 236.70 | 21.04 | 4.21 | 0.84 | 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 Lacs | 249.11 | 208.93 | (6.73) | (23.56) | (26.93) | (27.60) | (27.74) | (27.77) | (27.77) | (27.77) | (27.77) | (27.77) | (17.52) | (17.52) | (17.52) | (17.52) | (17.52) | (17.52) | (17.52) | (17.52) |
| Tax Benefit | Rs Lacs | 80.82 | 64.56 | (2.08) | (7.28) | (8.32) | (8.53) | (8.57) | (8.58) | (8.58) | (8.58) | (8.58) | (8.58) | (5.41) | (5.41) | (5.41) | (5.41) | (5.41) | (5.41) | (5.41) | (5.41) |
| Discounted Tax Benefit | Rs Lacs | 80.82 | 60.82 | (1.73) | (5.36) | (5.42) | (4.91) | (4.36) | (3.86) | (3.42) | (3.02) | (2.67) | (2.36) | (1.32) | (1.16) | (1.03) | (0.91) | (0.80) | (0.71) | (0.63) | (0.56) |
| Levelised tax benefit | Rs Lacs | 11.67 | | | | | | | | | | | | | | | | | | | |
| Energy Generation | MU | 2.56 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 | 5.91 |
| Discounted Generation | MU | 2.56 | 5.57 | 4.93 | 4.35 | 3.85 | 3.40 | 3.01 | 2.66 | 2.35 | 2.08 | 1.84 | 1.63 | 1.44 | 1.27 | 1.12 | 0.99 | 0.88 | 0.78 | 0.69 | 0.61 |
| Levelised generation | MU | 5.51 | | | | | | | | | | | | | | | | | | | |
| Per Unit Benefit | Rs/kWh | 3.16 | 1.09 | (0.04) | (0.12) | (0.14) | (0.14) | (0.14) | (0.15) | (0.15) | (0.15) | (0.15) | (0.15) | (0.09) | (0.09) | (0.09) | (0.09) | (0.09) | (0.09) | (0.09) | (0.09) |
| Discount Factor | | 1.00 | 0.88 | 0.78 | 0.69 | 0.61 | 0.54 | 0.48 | 0.42 | 0.37 | 0.33 | 0.29 | 0.26 | 0.23 | 0.20 | 0.18 | 0.16 | 0.14 | 0.12 | 0.11 | 0.10 |
| Applicable Discount Factor | | 1.00 | 0.94 | 0.83 | 0.74 | 0.65 | 0.58 | 0.51 | 0.45 | 0.40 | 0.35 | 0.31 | 0.28 | 0.24 | 0.22 | 0.19 | 0.17 | 0.15 | 0.13 | 0.12 | 0.10 |
| Levelised ITAX benefit | Rs/kWh | 0.21 | | | | | | | | | | | | | | | | | | | |

Note(s):

1. In the above calculations, depreciation for the first year has been considered as 50.00%(= 50% of (80%+20%)) and generation for the first year has been considered as 50% of the normative generation as per CERC
2. For working out Tax benefit, income tax rate for the first year has been considered as 32.45% and a tax rate of 30.90% for subsequent years.
3. Figures may not tally exactly on account of rounding of .

TARIFF DETERMINATION FOR BIOMASS POWER PLANT WITH AIR COOLED CONDENSOR

Annex-II

FY 2014-15

| | |
|-------------|--------|
| Case Select | Option |
|-------------|--------|

2

| S. No. | Assumption Head | Sub-Head | Sub-Head (2) | Unit | Base Case | |
|----------------------|------------------------------------------------|----------------------|-----------------------------------------------------------------|-----------------------------|-----------------|----------------------------------------------------------------------------|
| 1 | Power Generation | Capacity | Installed Power Generation Capacity | MW | 1 | |
| | | | Auxiliary Consumption during stabilisation | % | 12.50% | |
| | | | Auxillary Consumption after stabilisation | % | 12% | |
| | | | PLF (Stablization for 6 months) | % | 60% | |
| | | | PLF (during first year after Stablization) | % | 70% | |
| | | | PLF (Second year onwards) | % | 75% | |
| | | | Useful Life of Transmission system | Years | 35 | |
| | | | Useful life of Power Plant | Years | 20 | |
| | | | 2 | Project Cost | Capital Cost/MW | including Power plant, Land, Transmission line cost & Connectivity charges |
| Power plant Cost | Power Plant Cost including connectivity charge | Rs Lakh/MW | | | 546 | |
| Tranmssion line Cost | | Rs Lakh/MW | | | 15 | |
| 3 | Sources of Fund | Debt: Equity | Debt | % | 70% | |
| | | | Equity | % | 30% | |
| | | | Total Debt Amount | Rs Lakh | 392.70 | |
| | | | Total Equity Amount | Rs Lakh | 168.30 | |
| | | Debt Component | Loan Amount | Rs Lakh | 392.70 | |
| | | | Intrest Rate | % | 12.71% | |
| | | Equity Component | Equity amount | Rs Lakh | 168.30 | |
| | | | Return on Equity | % p.a | 16.00% | |
| | | | Discount Rate (As per CERC Notification 7.10.1) | % | 13.10% | |
| 4 | Financial Assumptions | Fiscal Assumptions | Income Tax (for yr-11 to yr-20) | % | 30.90% | |
| | | | MAT Rate (for yr-1)) | | 20.01% | |
| | | | MAT Rate (for yr-2 to yr-10) | % | 19.06% | |
| | | | 80 IA benefits | Yes/No | Yes | |
| | | | Accelerated depreciation benefit | Yes/No | 0.23 | |
| | | Depreciation | Depreciation Rate | % | 5.28% | |
| | | | Years for 5.28% rate | | 12 | |
| 5 | Working Capital | For Fixed Charges | O&M Expenses | Months | 1 | |
| | | | Maintenance Spares | (% of O&M exepenses) | 20% | |
| | | For Variable Charges | Receivables for Debtors | Months | 1.5 | |
| | | | Biomass Stock | Months | 4 | |
| | | | Intrest On Working Capital | % | 12.21% | |
| 6 | Fuel Related Assumptions | Heat Rate | After Stabilisation period | kCal/kWh | 4440 | |
| | | | During Stablization Period | kCal/kWh | 4540 | |
| | | Biomass | Biomass Price (FY14-15) | Rs/MT | 2450 | |
| | | | GCV - Biomass | kCal/kg | 3400 | |
| | | | Biomass Price Escalation Factor for working capital requirement | % | 5% | |
| | | | Handling and storage losses | % | 2% | |
| 7 | Operation & Maintenance | power plant | % of base capital cost | % | 6.5% | |
| | | | Transmission lines | % of transmission line cost | % | 3.0% |
| | | | Normative Total O & M Expenses Escalation rate | % | 5.72% | |
| | | | Total No. of Hours | hrs | 8760 | |

TARIFF DETERMINATION FOR BIOMASS POWER PLANT WITH AIR COOLED CONDENSOR

1 0.884 0.782 0.691 0.611 0.540 0.478 0.422 0.374 0.330 0.292 0.258 0.228 0.202 0.178 0.158 0.140 0.123 0.109 0.096

For Biomass plants to be commissioned during 2014-15

Cost of Generation

| Particulars of Generation | Unit | Years---> | 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 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 |
| Auxiliary Consumption | MU | | 0.70 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Net Generation | MU | | 5.00 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 |

| Variable Cost | Unit | Years---> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|------------------------|----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Biomass Cost | Rs Lakhs | | 187.75 | 225.13 | 236.38 | 248.20 | 260.61 | 273.64 | 287.32 | 301.69 | 316.77 | 332.61 | 349.24 | 366.71 | 385.04 | 404.29 | 424.51 | 445.73 | 468.02 | 491.42 | 515.99 | 541.79 |
| Per unit Variable Cost | Rs/kWh | | 3.76 | 3.89 | 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 |

| Fixed Cost | Unit | Years---> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---------------------------------------------|----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| O&M Expenses | Rs Lakhs | | 35.94 | 38.00 | 40.17 | 42.47 | 44.90 | 47.46 | 50.18 | 53.05 | 56.08 | 59.29 | 62.68 | 66.27 | 70.06 | 74.07 | 78.30 | 82.78 | 87.52 | 92.52 | 97.82 | 103.41 |
| Depreciation | Rs Lakhs | | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 |
| Interest on term loan | Rs Lakhs | | 48.02 | 44.25 | 40.49 | 36.73 | 32.96 | 29.20 | 25.43 | 21.67 | 17.91 | 14.14 | 10.38 | 6.62 | 3.55 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Interest on working Capital | Rs Lakhs | | 14.21 | 16.37 | 17.06 | 17.79 | 18.56 | 19.38 | 20.23 | 21.14 | 22.09 | 23.09 | 24.24 | 25.35 | 26.37 | 27.63 | 28.97 | 30.41 | 31.91 | 33.50 | 35.16 | 36.91 |
| Return on Equity | Rs Lakhs | | 33.66 | 33.27 | 33.27 | 33.27 | 33.27 | 33.27 | 33.27 | 33.27 | 33.27 | 33.27 | 33.27 | 38.97 | 38.97 | 38.97 | 38.97 | 38.97 | 38.97 | 38.97 | 38.97 | 38.97 |
| Total Fixed Cost | Rs Lakhs | | 161.45 | 161.51 | 160.61 | 159.87 | 159.31 | 158.93 | 158.74 | 158.97 | 159.41 | 165.89 | 166.83 | 157.63 | 160.53 | 164.93 | 170.84 | 177.08 | 183.67 | 190.63 | 197.97 | |
| Per unit Fixed Cost | Rs/kWh | | 3.23 | 2.79 | 2.78 | 2.77 | 2.76 | 2.75 | 2.75 | 2.75 | 2.76 | 2.87 | 2.89 | 2.73 | 2.78 | 2.85 | 2.95 | 3.06 | 3.18 | 3.30 | 3.42 | |
| Per unit Fixed Cost considering accelerated | Rs/kWh | | 3.00 | 2.56 | 2.55 | 2.53 | 2.52 | 2.52 | 2.51 | 2.51 | 2.52 | 2.53 | 2.64 | 2.65 | 2.50 | 2.55 | 2.62 | 2.72 | 2.83 | 2.95 | 3.07 | 3.19 |

Levelised per unit fixed charges (Rs/kWh) 2.86
(Without Availing AD Benefit)

Levelised per unit fixed charges (Rs/kWh) 2.63
(With Availing AD Benefit)

Applicable Tariff for plants commissioned during FY 2014-15

| | | |
|--------------------------------|------|--------|
| Variable Cost (FY 2014-15) | 3.76 | Rs/kWh |
| Levelised Fixed Cost | 2.86 | Rs/kWh |
| Applicable Tariff (FY 2014-15) | 6.62 | Rs/kWh |
| Accelerated Depreciation | 0.23 | Rs/kWh |
| Net Tariff (FY 2013-14) | 6.39 | Rs/kWh |

Applicable Tariff for plants commissioned during FY 2009-2014

| | | |
|----------------------------|------|--------|
| Variable Cost (FY 2009-14) | 3.71 | Rs/kWh |
|----------------------------|------|--------|

TARIFF DETERMINATION FOR BIOMASS POWER PLANT WITH AIR COOLED CONDENSOR
Variable Cost 2014-15

| S. No. | Particulars | Unit | Stabilisation Period (First 6 Month) | Remain. 6 month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|--------|-------------------------|---------------|--------------------------------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 | 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 |
| 2 | Plant load factor | % | 60% | 70% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% |
| 3 | Gross energy generation | MU | 2.63 | 3.07 | 5.694 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 | 6.57 |
| 4 | Auxiliary Consumption | % | 12.5% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% | 12.0% |
| 5 | Auxiliary Consumption | MU | 0.33 | 0.37 | 0.70 | 0.788 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| 6 | Net Energy generation | MU | 2.30 | 2.70 | 5.00 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 |
| 7 | Station Heat Rate | Kcal/kWh | 4540 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 | 4440 |
| 8 | Energy Input required | Million Kcal | 11931.1 | 13613.0 | 0.0 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 | 29170.8 |
| 9 | Calorific Value | Kcal/kg | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 | 3400 |
| 10 | Biomass Required | Million Kg | 3.509 | 4.004 | 7.66 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 | 8.751 |
| 11 | Biomass Price | Rs/ MT | | | 2450 | 2573 | 2701 | 2836 | 2978 | 3127 | 3283 | 3447 | 3620 | 3801 | 3991 | 4190 | 4400 | 4620 | 4851 | 5093 | 5348 | 5615 | 5896 | 6191 |
| 12 | Biomass Cost | Rs Lakh | | | 187.7 | 225.1 | 236.4 | 248.2 | 260.6 | 273.6 | 287.3 | 301.7 | 316.8 | 332.6 | 349.2 | 366.7 | 385.0 | 404.3 | 424.5 | 445.7 | 468.0 | 491.4 | 516.0 | 541.8 |
| 13 | Variable Cost | Rs/kWh | | | 3.76 | 3.89 | 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 |

TARIFF DETERMINATION FOR BIOMASS POWER PLANT WITH AIR COOLED CONDENSOR
Variable Cost 2009-14

| S. No. | Particulars | Unit | Variable Charges |
|---------------|-------------------------|---------------|-------------------------|
| 1 | Installed Capacity | MW | 1 |
| 2 | Plant load factor | % | 75% |
| 3 | Gross energy generation | MU | 6.57 |
| 4 | Auxiliary Consumption | % | 12.0% |
| 5 | Auxiliary Consumption | MU | 0.79 |
| 6 | Net Energy generation | MU | 5.78 |
| 7 | Station Heat Rate | kCal/kWh | 4440 |
| 8 | Energy Input required | Million Kcal | 29170.8 |
| 9 | Calorific Value | kCal/kg | 3400 |
| 10 | Biomass Required | Million Kg | 8.751 |
| 11 | Biomass Price | Rs/MT | 2450 |
| 12 | Biomass Cost | Rs Lakh | 214.4 |
| 13 | Variable Cost | Rs/kWh | 3.71 |

TARIFF DETERMINATION FOR BIOMASS POWER PLANT WITH AIR COOLED CONDENSOR

Determination of Accelerated Depreciation Benefit for Biomass Power Projects

Annex-II Contd..

| | | |
|------------------------------|--------|-----------------------|
| Depreciation amount | 90% | |
| Depreciation rate | 5.28% | |
| Tax Depreciation rate | 80% | |
| Additional depreciation rate | 20% | |
| Income Tax | 32.45% | 30.90% (yr-2 onwards) |
| Capital Cost | 561.00 | Rs Lakh/MW |

| Year(s)--> | Unit | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|------------------------------------|----------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 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% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% |
| Depreciation | Rs Lacs | 14.81 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 29.62 | 18.68 | 18.68 | 18.68 | 18.68 | 18.68 | 18.68 | 18.68 | 18.68 |
| Higher Depreciation Benefit | | | | | | | | | | | | | | | | | | | | | |
| Opening balance | % | 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 | % | 50.00% | 45.00% | 4.00% | 0.80% | 0.16% | 0.03% | 0.01% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 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% |
| Higher depreciation | Rs Lacs | 280.50 | 222.45 | 22.44 | 4.49 | 0.90 | 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 |
| Net depreciation benefit | Rs Lacs | 265.69 | 222.83 | (7.18) | (25.13) | (28.72) | (29.44) | (29.58) | (29.61) | (29.62) | (29.62) | (29.62) | (29.62) | (18.68) | (18.68) | (18.68) | (18.68) | (18.68) | (18.68) | (18.68) | (18.68) |
| Tax Benefit | Rs Lacs | 86.20 | 68.85 | (2.22) | (7.77) | (8.88) | (9.10) | (9.14) | (9.15) | (9.15) | (9.15) | (9.15) | (9.15) | (5.77) | (5.77) | (5.77) | (5.77) | (5.77) | (5.77) | (5.77) | (5.77) |
| Discounted Tax Benefit | Rs Lacs | 86.20 | 64.87 | (1.85) | (5.72) | (5.78) | (5.24) | (4.65) | (4.12) | (3.64) | (3.22) | (2.85) | (2.52) | (1.40) | (1.24) | (1.10) | (0.97) | (0.86) | (0.76) | (0.67) | (0.59) |
| Levelised tax benefit | Rs Lacs | 12.44 | | | | | | | | | | | | | | | | | | | |
| Energy Generation | MU | 2.50 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 | 5.78 |
| Discounted Generation | MU | 2.50 | 5.45 | 4.82 | 4.26 | 3.76 | 3.33 | 2.94 | 2.60 | 2.30 | 2.03 | 1.80 | 1.59 | 1.41 | 1.24 | 1.10 | 0.97 | 0.86 | 0.76 | 0.67 | 0.59 |
| Levelised generation | MU | 5.39 | | | | | | | | | | | | | | | | | | | |
| Per Unit Benefit | Rs/kWh | 3.45 | 1.19 | (0.04) | (0.13) | (0.15) | (0.16) | (0.16) | (0.16) | (0.16) | (0.16) | (0.16) | (0.16) | (0.10) | (0.10) | (0.10) | (0.10) | (0.10) | (0.10) | (0.10) | (0.10) |
| Discount Factor | | 1.00 | 0.88 | 0.78 | 0.69 | 0.61 | 0.54 | 0.48 | 0.42 | 0.37 | 0.33 | 0.29 | 0.26 | 0.23 | 0.20 | 0.18 | 0.16 | 0.14 | 0.12 | 0.11 | 0.10 |
| Applicable Discount Factor | | 1.00 | 0.94 | 0.83 | 0.74 | 0.65 | 0.58 | 0.51 | 0.45 | 0.40 | 0.35 | 0.31 | 0.28 | 0.24 | 0.22 | 0.19 | 0.17 | 0.15 | 0.13 | 0.12 | 0.10 |
| Levelised ITAX benefit | Rs/kWh | 0.23 | | | | | | | | | | | | | | | | | | | |

Note(s):

1. In the above calculations, depreciation for the first year has been considered as 50.00%(= 50% of (80%+20%)) and generation for the first year has been considered as 50% of the normative generation as per CERC
2. For working out Tax benefit, income tax rate for the first year has been considered as 32.45% and a tax rate of 30.90% for subsequent years.
3. Figures may not tally exactly on account of rounding of .

TARIFF DETERMINATION FOR BIOGAS POWER PROJECTS GETTING COMMISSIONED DURING FY 2014-15

FY 2014-15

| S. No. | Assumption Head | Sub-Head | Sub-Head (2) | Unit | Base Case |
|--------|-------------------------------------------------|----------------------------------------------|------------------------------------------------|----------------------|-----------|
| 1 | Power Generation | Capacity | Installed Power Generation Capacity | MW | 1 |
| | | | Auxiliary Consumption | % | 12.00% |
| | | | PLF (Stablization for 6 months) | % | 85% |
| | | | Useful Life of Transmission system | Years | 35 |
| | | | Useful life of Power Plant | Years | 20 |
| 2 | Project Cost | Capital Cost/MW | Power plant cost (before subsidy) | Rs Lakh/MW | 1153 |
| | | | Power Plant Cost (after subsidy) | Rs Lakh/MW | 853 |
| | | Tranmssion line Cost Connectivity Charges | | Rs Lakh/MW | 15 |
| | | | | Rs Lakh/MW | 2 |
| 3 | Sources of Fund | Debt: Equity | Debt | % | 70% |
| | | | Equity | % | 30% |
| | | | Total Debt Amount | Rs Lakh | 597.10 |
| | | | Total Equity Amout | Rs Lakh | 255.90 |
| | | | | | |
| | | Debt Component | Loan Amount | Rs Lakh | 597.10 |
| | | | Moratorium Period | years | 0 |
| | | | Intrest Rate | % | 12.71% |
| | | Equity Component | Equity amount | Rs Lakh | 255.9 |
| | | | Return on Equity | % p.a | 16.00% |
| | Discount Rate (As per CERC Notification 7.10.1) | % | 13.10% | | |
| 4 | Financial Assumptions | Fiscal Assumptions | Income Tax (| % | 30.90% |
| | | | MAT Rate (for first year) | | 20.01% |
| | | | MAT Rate (for yr-2 to yr-10) | % | 19.06% |
| | | | 80 IA benefits | Yes/No | Yes |
| | | | Accelerated depreciation benefit | Yes/No | Yes |
| | | | Accelerated depreciation benefit | Rs/kWh | 0.310 |
| | | | Depreciation Rate | % | 5.28% |
| | | | Years for 5.28% rate | Years | 12 |
| 5 | Working Capital | For Fixed Charges | O&M Expenses | Months | 1 |
| | | | Maintenance Spares | (% of O&M exepenses) | 20% |
| | | | Receivables for Debtors | Months | 1.5 |
| | | | For Variable Charges | | |
| | | | Biogas Stock | Months | 4 |
| | | | Intrest rate on Working Capital | % | 12.21% |
| 6 | Fuel Related Assumptions | Biogas | Fuel Price | Rs/MT | 1175 |
| | | | Specific Fuel Consumption | kg/kWh | 3 |
| | | | Substrate Price Escalation Factor | % | 5% |
| 7 | Operation & Maintenance | O&M Expenses (2014-1 | Rs Lakhs | Rs Lakkhs | 44.7 |
| | | | Normative Total O & M Expenses Escalation rate | % | 5.72% |
| | | | Total No. of Hours | hrs | 8760 |

TARIFF DETERMINATION FOR BIOGAS POWER PROJECTS GETTING COMMISSIONED DURING FY 2014-15

FY 2014-15

1 0.884 0.782 0.691 0.611 0.540 0.478 0.422 0.374 0.330 0.292 0.258 0.228 0.202 0.178 0.158 0.140 0.123 0.109 0.096

For Biogas power projects to be commissioned during FY 2014-15

Cost of Generation

| Particulars of Generation | Unit | Years---> | 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 | | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Net Generation | MU | | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 |

| Variable Cost | Unit | Years---> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|------------------------|----------|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Biogas Cost | Rs Lakhs | | 262.47 | 275.60 | 289.37 | 303.84 | 319.04 | 334.99 | 351.74 | 369.32 | 387.79 | 407.18 | 427.54 | 448.92 | 471.36 | 494.93 | 519.68 | 545.66 | 572.94 | 601.59 | 631.67 | 663.25 |
| Per unit Variable Cost | Rs/kWh | | 4.01 | 4.21 | 4.42 | 4.64 | 4.87 | 5.11 | 5.37 | 5.64 | 5.92 | 6.21 | 6.52 | 6.85 | 7.19 | 7.55 | 7.93 | 8.33 | 8.74 | 9.18 | 9.64 | 10.12 |

| Fixed Cost | Unit | Years---> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---------------------------------------------|-----------------|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| O&M Expenses | Rs Lakhs | | 44.71 | 47.27 | 49.97 | 52.83 | 55.85 | 59.05 | 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 Lakhs | | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 28.40 | 28.40 | 28.40 | 28.40 | 28.40 | 28.40 | 28.40 | 28.40 |
| Interest on term loan | Rs Lakhs | | 73.01 | 67.29 | 61.56 | 55.84 | 50.12 | 44.40 | 38.67 | 32.95 | 27.23 | 21.50 | 15.78 | 10.06 | 5.39 | 1.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Interest on working Capital | Rs Lakhs | | 19.80 | 20.57 | 21.41 | 22.28 | 23.21 | 24.19 | 25.22 | 26.32 | 27.47 | 28.68 | 30.10 | 31.45 | 32.63 | 34.17 | 35.81 | 37.57 | 39.42 | 41.36 | 43.40 | 45.55 |
| Return on Equity | Rs Lakhs | | 51.18 | 50.58 | 50.58 | 50.58 | 50.58 | 50.58 | 50.58 | 50.58 | 50.58 | 50.58 | 59.25 | 59.25 | 59.25 | 59.25 | 59.25 | 59.25 | 59.25 | 59.25 | 59.25 | 59.25 |
| Total Fixed Cost | Rs Lakhs | | 233.74 | 230.75 | 228.56 | 226.57 | 224.80 | 223.25 | 221.94 | 220.88 | 220.08 | 219.57 | 228.15 | 228.24 | 212.84 | 215.76 | 220.88 | 228.21 | 235.95 | 244.12 | 252.75 | 261.85 |
| Per unit Fixed Cost | Rs/kWh | | 3.57 | 3.52 | 3.49 | 3.46 | 3.43 | 3.41 | 3.39 | 3.37 | 3.36 | 3.35 | 3.48 | 3.48 | 3.25 | 3.29 | 3.37 | 3.48 | 3.60 | 3.73 | 3.86 | 4.00 |
| Per unit Fixed Cost considering accelerated | Rs/kWh | | 3.26 | 3.21 | 3.18 | 3.15 | 3.12 | 3.10 | 3.08 | 3.06 | 3.05 | 3.04 | 3.17 | 3.17 | 2.94 | 2.98 | 3.06 | 3.17 | 3.29 | 3.42 | 3.55 | 3.69 |

Levelised per unit fixed charges (Rs/kWh) 3.47

(Without Availing AD Benefit)

Levelised per unit fixed charges (Rs/kWh) 3.16

(With Availing AD Benefit)

Applicable Tariff for FY 2014-15

| | | |
|--------------------------------|------|--------|
| Variable Cost (FY 2014-15) | 4.01 | Rs/kWh |
| Levelised Fixed Cost | 3.47 | Rs/kWh |
| Applicable Tariff (FY 2014-15) | 7.48 | Rs/kWh |
| Accelerated Depreciation | 0.31 | Rs/kWh |
| Net Tariff (FY 2014-15) | 7.17 | Rs/kWh |

TARIFF DETERMINATION FOR BIOGAS POWER PROJECTS GETTING COMMISSIONED DURING FY 2014-15

Determination of Accelerated Depreciation Benefit for Biogas based Power Projects FY 2014-15

| | | |
|------------------------------|--------|-----------------------|
| Depreciation amount | 90% | |
| Book Depreciation rate | 5.28% | |
| Tax Depreciation rate | 80% | |
| Additional depreciation rate | 20% | |
| Income Tax | 32.45% | 30.90% (yr-2 onwards) |
| Capital Cost | 853.00 | Rs Lakh/MW |

| Year(s)--> | 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% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% | 3.33% |
| Book Depreciation | Rs Lakh | 22.52 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 45.04 | 28.40 | 28.40 | 28.40 | 28.40 | 28.40 | 28.40 | 28.40 | 28.40 | 28.40 |
| Higher Depreciation Benefit | | | | | | | | | | | | | | | | | | | | | |
| Opening balance | % | 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 | % | 50.00% | 45.00% | 4.00% | 0.80% | 0.16% | 0.03% | 0.01% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 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% |
| Higher depreciation | Rs Lakh | 426.50 | 383.85 | 34.12 | 6.82 | 1.36 | 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 |
| Net depreciation benefit | Rs Lakh | 403.98 | 338.81 | (10.92) | (38.21) | (43.67) | (44.77) | (44.98) | (45.03) | (45.04) | (45.04) | (45.04) | (28.40) | (28.40) | (28.40) | (28.40) | (28.40) | (28.40) | (28.40) | (28.40) | (28.40) |
| Tax Benefit | Rs Lakh | 131.07 | 104.69 | (3.37) | (11.81) | (13.50) | (13.83) | (13.90) | (13.91) | (13.92) | (13.92) | (13.92) | (8.78) | (8.78) | (8.78) | (8.78) | (8.78) | (8.78) | (8.78) | (8.78) | (8.78) |
| Discounted Tax Benefit | Rs Lakh | 131.07 | 98.63 | (2.81) | (8.70) | (8.79) | (7.96) | (7.08) | (6.26) | (5.54) | (4.90) | (4.33) | (2.41) | (2.13) | (1.89) | (1.67) | (1.48) | (1.30) | (1.15) | (1.02) | (0.90) |
| Levelised tax benefit | Rs Lakh | 19.09 | | | | | | | | | | | | | | | | | | | |
| Energy Generation | MU | 3.28 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 | 6.55 |
| Discounted Generation | MU | 3.28 | 6.17 | 5.46 | 4.83 | 4.27 | 3.77 | 3.34 | 2.95 | 2.61 | 2.31 | 2.04 | 1.80 | 1.59 | 1.41 | 1.25 | 1.10 | 0.97 | 0.86 | 0.76 | 0.67 |
| Levelised generation | MU | 6.16 | | | | | | | | | | | | | | | | | | | |
| Per Unit Benefit | Rs/kWh | 4.00 | 1.60 | (0.05) | (0.18) | (0.21) | (0.21) | (0.21) | (0.21) | (0.21) | (0.21) | (0.21) | (0.13) | (0.13) | (0.13) | (0.13) | (0.13) | (0.13) | (0.13) | (0.13) | (0.13) |
| Discount Factor | | 1.00 | 0.88 | 0.78 | 0.69 | 0.61 | 0.54 | 0.48 | 0.42 | 0.37 | 0.33 | 0.29 | 0.26 | 0.23 | 0.20 | 0.18 | 0.16 | 0.14 | 0.12 | 0.11 | 0.10 |
| Applicable Discount Factor | | 1.00 | 0.94 | 0.83 | 0.74 | 0.65 | 0.58 | 0.51 | 0.45 | 0.40 | 0.35 | 0.31 | 0.28 | 0.24 | 0.22 | 0.19 | 0.17 | 0.15 | 0.13 | 0.12 | 0.10 |
| Levelised ITAX benefit | Rs/kWh | 0.31 | | | | | | | | | | | | | | | | | | | |

Note(s):

1. In the above calculations, depreciation for the first year has been considered as 50.00%(= 50% of (80%+20%)) and generation for the first year has been considered as 50% of the normative generation as per CERC
2. For working out Tax benefit, income tax rate for the first year has been considered as 32.45% and a tax rate of 30.90% for subsequent years.
3. Figures may not tally exactly on account of rounding off.

List of stakeholders from which suggestions/comments received

1. M/s Kalpataru Power Transmission Ltd
2. M/s Rudraksh Energy
3. Sh. Shanti Prasad
4. M/s Sathyam Green Power Pvt. Ltd.
5. M/s Suryaa Chamball Power Limited
6. Indian Biomass Power Association
7. M/s Transtech Green Power Pvt. Ltd.
8. Rajasthan Biomass Power Developers Association
9. M/s JVVNL
10. M/s Sambhav Energy Ltd.

Summary of comments/suggestions

| S.No | Name of Stakeholders | Issue | Comments/Suggestions |
|------|------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Kalpataru Power Transmission | Consideration of other variations like cost of living etc., for plants commissioned during 2009-14 | Variation only in fuel cost for plants commissioned during 2009-14 has been considered but variation on cost of living, salary wages and other including sustainability components modification in plants and machinery etc have not been considered, which may be considered while preparing Regulations for next MYT 2015-2019. |
| 2 | Rudraksh Energy | <p>Capital Cost</p> <p>Depreciation</p> <p>MAT rate & Income Tax</p> <p>Variable charges</p> | <p>Transmission cost of ₹ 15 Lakh/MW is for 33 kV system upto 20 MW, for 132 kV system having plant capacity above 20 MW Transmission system cost would be ₹ 25 Lakh/MW. Normative Capital cost therefore, would be ₹ 536 Lakh/MW and ₹ 571 Lakh/MW for FY 2014-15 for the Biomass power plants employing water cooled and air cooled condensers.</p> <p>Depreciation rate should be changed from 5.28% to 5.83% as in case of solar and Wind projects so that loan is paid back in 12 years through depreciation reserves.</p> <p>Surcharge has not been abolished by the Government and therefore, till such time the same rate be continued for the years subsequent to the first year.</p> <p>For the plants commissioned under the policy 25.10.2004, the tariff for 11th year</p> |

| S.No | Name of Stakeholders | Issue | Comments/Suggestions |
|------|----------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | Calculation sheet | <p>onwards was kept constant, whereas, the fuel cost keeps on changing and impact on tariff is inevitable. The impact of increase in cost of fuel of the plants, commissioned prior to the period 2009-14 may also be considered.</p> <p>Further, Govt. should adopt measure to control the price of Biomass and also to restrict the movement of Biomass outside the State.</p> <p>Rate of Income Tax in the fiscal assumptions is indicated as 30.90% whereas in calculation of accelerated depreciation benefits, it has been considered as 32.45%. Also, in the table, where, higher Depreciation benefit is worked out, the depreciation allowed during the year is shown as 50% but in the Note No. 1, it has been mentioned 40% i.e. 50% of 80%.</p> |

| S.No | Name of Stakeholders | Issue | Comments/Suggestions |
|------|----------------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | Sh. Shanti Prasad | MAT Rate/Income Tax Discount rate | <p>The abolition of surcharge has not yet materialized and not considering surcharge on Income Tax/ MAT for second and subsequent years does not appear logical and is also not as per the regulation 21(4)&(5) at RERC Tariff Regulations 2009.</p> <p>CERC vide their order dated 21.02.2014 on Petition No. 002/ SM/ 2014 has discontinued notifying discount rate w.e.f. 1.4.2014 for evaluation of bids. Accordingly, in their latest Notification No. Eco-1/ 2014-CERC dated 07.04.2014, no discount rate has been notified for evaluation of bids. There is no discount rate notified by CERC and valid at present. Commission has vide order No 16 dated 31.12.2012 in respect of Biomass based power plants during FY 2012-13 has adopted rate equal to Cost of capital as 14.02%. It would, therefore, be relevant to review discount rate and Commission may consider the same based on cost of capital.</p> |

| S.No | Name of Stakeholders | Issue | Comments/Suggestions |
|------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 | M/s Sathyam Green Power Pvt. Ltd. | <p>A.Variable charges for Biomass power plant commissioned during 2009-14</p> <p>a. Price of biomass</p> <p>b. GCV of Biomass</p> <p>c.Biomass storage and handling cost</p> <p>B. Other issues related to plants commissioned during FY 2009-14</p> <p>a. AD Benefit</p> | <p>The biomass price of ₹ 2733.33 MT decided by CERC for the State of Rajasthan for FY 2014-15 may be adopted for determining the variable tariff for FY 2014-15 for the plants commissioned in the control period of FY 2009-14.</p> <p>When norm of GCV of 3400 kCal/kg was adopted in 2009, none of the biomass power plants under 2009 Policy was in operation and hence there was no data base for computing norm for GCV. Consultant appointed by RREC concluded that the average GCV as being fed to the boiler was 3050 kCal/kg. GCV as recommended by CERC committee and approved by CERC, which is also corroborated by the consultant appointed by RREC may be adopted.</p> <p>Storage and handling costs may also be considered for determining variable charges.</p> <p>Not a single biomass plant under 2009 policy has</p> |

| S.No | Name of Stakeholders | Issue | Comments/Suggestions |
|------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <p>b. Application of current MAT rate to calculate RoE</p> <p>c. Rate of interest</p> <p>d. Considering repayment of installment of loan equal to rate of depreciated</p> | <p>availed AD benefit and hence concept of cost plus requires that their tariff should not be reduced by deducting notional AD Tariff. There was not provisions in the 2009 policy dated 23.01.2009 to reduce tariff on account of availment of AD benefit, however, this was done in the tariff calculations without any provision in policy.</p> <p>MAT/Tax rate is a recurring phenomenon, the non revision of this component results in departure form cost plus basis of tariff fixation. This component may be revised for all operating plants every year.</p> <p>The rate of interest on long term loan as well as working capital is revised by financial institutions/ banks every year. Thus, the current rate of interest as accepted by the Hon'ble commission may be made applicable to all operating plants.</p> <p>As per Notification dated 23.01.2009, as at para 22(3), the repayment for each year shall be deemed to be equal to the depreciation allowed for that year. This aspect may be considered for all the operating plants since it is matter of principle and implementation of the policy as determined by the</p> |

| S.No | Name of Stakeholders | Issue | Comments/Suggestions |
|------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <p>e. O& M Expenses</p> <p>f. Increase in working capital due to higher price of fuel</p> <p>C. Generic Tariff of plants to be commissioned in FY 2014-15</p> <p>a. Fixed tariff 1) Capital cost</p> | <p>Commission.</p> <p>O&M expenses of ₹ 42.29 Lakh/MW, as approved by CERC, may be accepted as norm and made applicable to the plants already commissioned earlier under 2009 Policy since these plants are suffering losses by incurring high O&M expenses.</p> <p>When the fixed tariff was fixed by Commission at ₹ 2.56/kWh as per order dated 17.08.2009, the price of Biomass was taken as ₹ 1216/MT. Presently, the biomass price considered by the Commission is ₹ 2450/MT and working Capital norm includes 4 months stock of Biomass. Thus, the cost of biomass storage for a 10 MW power plant operating at 75% PLF has increased by ₹ 35.29 million, the interest on which at the rate of 13.5% comes to ₹ 4.75 million per annum.</p> <p>The capital cost has been revised by CERC by applying the indexation formula to the capital cost of 2013-14, same may be adopted</p> |

| S.No | Name of Stakeholders | Issue | Comments/Suggestions |
|------|-----------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | <p>passed on 30.09.2013 on petition No. 22 of 2011 (T) as a result of direction of Hon'ble APTEL, has held that the billing point for biomass power plants should be the bus bars of the biomass generating plant or alternatively, the distribution licensee shall pay to biomass generator additional fixed cost and energy charges for the energy loss in between bus bar of the biomass generator and grid substation. Same principle may be made applicable in SCPL's case.</p> |
| 6 | Indian Biomass power Association (IBPA) | Biomass power plants commissioned under 2009-14 Regulations | <p>Biomass plants set up under regulation 2009-14 are already in huge financial stress. For them, the present hearing is seeking no comments from the public as their fixed cost is already determined and variable cost already set as per 7th Amendment of Tariff Regulations for which Commission has conducted a proper public hearing process and issued valid orders. As practically no comments can be given for such plants, Commission may declare the tariff for them by simply adding fixed cost already fixed for them and variable cost as per 7th Amendment for which Commission has issued order on 19.02.2014.</p> <p>IBPA would request Commission's rational and</p> |

| S.No | Name of Stakeholders | Issue | Comments/Suggestions |
|------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | <p>fair consideration, in conducting the public hearing process for plants coming up in 2014-15 and releasing the tariff for old plants already commissioned under 2009-14 regulations as per decided parameters so as to save the sector in the State from further sufferance as delay in releasing tariff would put them in the financial and operational stress.</p> |
| 7 | Transtech Green Power Pvt. Ltd. | <p>1. Difference in Variable tariff for 2014-15 for old and new plants.</p> <p>2. Revision in GCV, O&M Expenses and Fuel prices</p> | <p>Variable cost for new plants to be commissioned in 2014-15 has been notified as ₹ 3.76 per unit and for old plants set up under regulation 2009-14 as ₹ 3.71 per unit. The variable cost for all plants for the year 2014-15 (same year) can not be different. Commission may make the variable cost for the year same for both old and new plants irrespective of the year in which it is established.</p> <p>The GCV, O&M expenses and Biomass fuel prices specified by RERC are different from CERC, which directly affect the operation and profitability of Biomass operations. CERC has revised them after a thorough study of task force committee report. Commission may revise GCV as 3100 kCal/kg from 3400 kCal/kg, O&M Expenses as ₹ 40 Lakh/MW. The fuel price of ₹ 2730 MT as</p> |

| S.No | Name of Stakeholders | Issue | Comments/Suggestions |
|------|----------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <p>3. Separate fixed cost and fuel cost for Juliflora based power plants</p> <p>4. Accelerated Depreciation Benefit</p> | <p>per CERC Regulations for fuel price released for Rajasthan for FY 2014-15 may be adopted.</p> <p>Commission has not allowed separate fixed cost and variable cost for Juliflora despite this State having a policy to promote the use of Juliflora for power generation. Further, as per directions of Commission, the independent survey was done in the year 2010 by the State Govt., which had reflected a price of Juliflora as ₹ 2240 Per MT at that time. However, Commission had set up the same fuel price of ₹ 1830 per ton for mustard husk and the Juliflora based power plants. This is one prime reason that their plants are continuously accumulating losses.</p> <p>As Regulations 2009-14 have been amended to provide additional Tariff of 0.23 paise to those plants who are not claiming AD, this benefit should be available to old plants who are not claiming AD benefit. CERC in its second amendment of Biomass Regulations in Feb, 2014 have mentioned that amendment in biomass regulation would be applicable to old as well as new plants. AD tariff should be provided to all plants set</p> |

| S.No | Name of Stakeholders | Issue | Comments/Suggestions |
|------|----------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | 5. Application of current MAT rate to calculate ROE | <p>up in 2009-14 Regulations, who are not claiming the AD benefits, from the date of order prospectively. APTEL in the matter of Gujarat developers had directed SERC that even signed PPA can be reopened and conditions including fuel cost can be revised to ensure viability of power plant operations.</p> <p>Commission in its order No. 14 dated 09.12.2011 adjusted the fixed charges due to revision of MAT Rate for plants commissioned in FY 2011-12. This revision in fixed tariff has not been done for the plants commissioned under 2009 policy before 2011-12. MAT rates are part of government policy, which may stand for 5 years or if Government desires may change it two times in a year. Our RoE was calculated on old MAT rates prevailing at that time which was 4%. The MAT rate has subsequently changed to 18% and hence, RoE has to be calculated on revised MAT rate of 18%. This would affect tariff to increase by 2 to 3 paisa, which should not be denied. Current MAT rates may be made applicable and RoE and fixed cost revised for plants commissioned in the 2009-14 regulation prior to 2011-12, where RoE and Fixed cost has been calculated on old</p> |

| S.No | Name of Stakeholders | Issue | Comments/Suggestions |
|------|------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | 6. Repayment of loan deemed to be equal to the depreciation | <p>MAT rates, more so as it has been alone for all plants set up after 2011-12.</p> <p>As per para 22(3) of Notification dated 23.01.2009 repayment for each year shall be deemed to be equal to the depreciation allowed for that year. This aspect may be considered for all the operating plants, since it is matter of principle and implementation of the policy as determined by the Commission.</p> |
| 8 | Rajasthan Biomass power developers Association | Capital cost | The fixed cost for Juliflora based power plants may be notified by Commission as ₹ 6.30 Cr/MW as per CERC Regulations. The other suggestions are the same as at s.no. 7 |
| 9 | JVNL | <p>1) Capital cost</p> <p>2) Plant Load factor</p> | <p>Revision in Capital cost of the power plants be considered in line with Tariff approved in the neighboring State of Gujarat and reasonable variation of approx. 5.7% may be allowed in the capital cost.</p> <p>PLF of the Biomass power plants based on water cooled and air cooled condenser be revised to 80 % and 85 % respectively from the second year onwards and PLF of 90 % be considered for Biogas based power plants for generic tariff computation.</p> |

| S.No | Name of Stakeholders | Issue | Comments/Suggestions |
|------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <p>3) Auxiliary consumption</p> <p>4) Working Capital (a) Maintenance spares</p> <p>(b) Receivable for debtors</p> <p>5) Actual Cost</p> | <p>Auxiliary consumption of 10% may be considered which has been approved by CERC for the Rajasthan and also considered by CERC.</p> <p>The maintenance spares may be revised to 15% of O&M expenses from 20% of the draft order in line with central norms determined for the State of Rajasthan.</p> <p>Receivables to debtors may be considered as one month instead of one and half month as currently being considered by the Hon'ble Commission.</p> <p>As per Section 43 of the Income Tax Act, Commission may consider depreciation on the net cost i.e. ₹ 853 Lakh/MW instead of ₹1153 Lakh/MW in the working sheet for accelerated depreciation benefit.</p> |
| 10 | Sambhav Energy Ltd. | <p>1) Energy Plantation</p> <p>2) Variable cost</p> | <p>In our case Biomass 500 MT/day is not available in the vicinity of plant. Energy plantation should be available within the vicinity of 50 km-100km plant premises to reduce raw material cost. Land for plantation be made available by Government.</p> <p>Variable cost may be increased to enable to get the raw materials from a distant place approx. 500 km and to run the plant on economical scale.</p> |

